Gp130/JAK/STAT Pathway Model Report

– Generated by the Bio-PEPA Workbench –

Maria Luisa Guerriero

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1 Bio-PEPA model

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\begin{aligned}
bind\_gl\_l\_1 &= [k\_1 \times gp130 \times LIF \times LIFR] \\
bind\_ll\_g\_2 &= [k\_2 \times LIFR \times LIF \times gp130] \\
bind\_go\_l\_3 &= [k\_3 \times gp130 \times OSM \times LIFR] \\
bind\_lo\_g\_4 &= [k\_4 \times LIFR \times OSM \times gp130] \\
bind\_oo\_g\_5 &= [k\_5 \times OSMR \times OSM \times gp130] \\
bind\_go\_o\_6 &= [k6 \times gp130 \times OSM \times OSMR] \\
phospho\_gll\_7 &= [k7 \times gp130{:}LIF{:}LIFR] \\
phospho\_gll\_8 &= [k8 \times gp130{:}LIF{:}LIFR] \\
phospho\_gll\_9 &= [k9 \times gp130\_P{:}LIF{:}LIFR] \\
phospho\_gll\_10 &= [k10 \times gp130{:}LIF{:}LIFR\_P] \\
phospho\_gol\_11 &= [k11 \times gp130{:}OSM{:}LIFR] \\
phospho\_gol\_12 &= [k12 \times gp130{:}OSM{:}LIFR] \\
phospho\_gol\_13 &= [k13 \times gp130\_P{:}OSM{:}LIFR] \\
phospho\_gol\_14 &= [k14 \times gp130{:}OSM{:}LIFR\_P] \\
phospho\_goo\_15 &= [k15 \times gp130{:}OSM{:}OSMR] \\
phospho\_goo\_16 &= [k16 \times gp130{:}OSM{:}OSMR] \\
phospho\_goo\_17 &= [k17 \times gp130\_P{:}OSM{:}OSMR] \\
phospho\_goo\_18 &= [k18 \times gp130{:}OSM{:}OSMR\_P] \\
phospho\_sgll\_19 &= [k19 \times STAT3{:}gp130\_P{:}LIF{:}LIFR] \\
phospho\_glls\_20 &= [k20 \times gp130{:}LIF{:}LIFR\_P{:}STAT3] \\
phospho\_sgol\_21 &= [k21 \times STAT3{:}gp130\_P{:}OSM{:}LIFR] \\
phospho\_gols\_22 &= [k22 \times gp130{:}OSM{:}LIFR\_P{:}STAT3] \\
phospho\_sgoo\_23 &= [k23 \times STAT3{:}gp130\_P{:}OSM{:}OSMR] \\
phospho\_goos\_24 &= [k24 \times gp130{:}OSM{:}OSMR\_P{:}STAT3] \\
bind\_gPll\_stat\_25 &= [k25 \times gp130\_P{:}LIF{:}LIFR \times STAT3\_c] \\
unbind\_gPll\_stat\_25 &= [km25 \times STAT3{:}gp130\_P{:}LIF{:}LIFR] \\
bind\_gllP\_stat\_26 &= [k26 \times gp130{:}LIF{:}LIFR\_P \times STAT3\_c] \\
unbind\_gllP\_stat\_26 &= [km26 \times gp130{:}LIF{:}LIFR\_P{:}STAT3] \\
bind\_gPllP\_stat\_27 &= [k27 \times gp130\_P{:}LIF{:}LIFR\_P \times STAT3\_c]
\end{aligned}
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\begin{aligned}
unbind\_gPllP\_stat\_27 &= [km27 \times STAT3{:}gp130\_P{:}LIF{:}LIFR\_P] \\
bind\_gPllP\_stat\_28 &= [k28 \times gp130\_P{:}LIF{:}LIFR\_P \times STAT3\_c] \\
unbind\_gPllP\_stat\_28 &= [km28 \times gp130\_P{:}LIF{:}LIFR\_P{:}STAT3] \\
bind\_sgPllP\_stat\_29 &= [k29 \times STAT3{:}gp130\_P{:}LIF{:}LIFR\_P \times STAT3\_c] \\
unbind\_sgPllP\_stat\_29 &= [km29 \times STAT3{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3] \\
bind\_gPllPs\_stat\_30 &= [k30 \times gp130\_P{:}LIF{:}LIFR\_P{:}STAT3 \times STAT3\_c] \\
unbind\_gPllPs\_stat\_30 &= [km30 \times STAT3{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3] \\
bind\_gPol\_stat\_31 &= [k31 \times gp130\_P{:}OSM{:}LIFR \times STAT3\_c] \\
unbind\_gPol\_stat\_31 &= [km31 \times STAT3{:}gp130\_P{:}OSM{:}LIFR] \\
bind\_golP\_stat\_32 &= [k32 \times gp130{:}OSM{:}LIFR\_P \times STAT3\_c] \\
unbind\_golP\_stat\_32 &= [km32 \times gp130{:}OSM{:}LIFR\_P{:}STAT3] \\
bind\_gPolP\_stat\_33 &= [k33 \times gp130\_P{:}OSM{:}LIFR\_P \times STAT3\_c] \\
unbind\_gPolP\_stat\_33 &= [km33 \times STAT3{:}gp130\_P{:}OSM{:}LIFR\_P] \\
bind\_gPolP\_stat\_34 &= [k34 \times gp130\_P{:}OSM{:}LIFR\_P \times STAT3\_c] \\
unbind\_gPolP\_stat\_34 &= [km34 \times gp130\_P{:}OSM{:}LIFR\_P{:}STAT3] \\
bind\_sgPolP\_stat\_35 &= [k35 \times STAT3{:}gp130\_P{:}OSM{:}LIFR\_P \times STAT3\_c] \\
unbind\_sgPolP\_stat\_35 &= [km35 \times STAT3{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3] \\
bind\_gPolPs\_stat\_36 &= [k36 \times gp130\_P{:}OSM{:}LIFR\_P{:}STAT3 \times STAT3\_c] \\
unbind\_gPolPs\_stat\_36 &= [km36 \times STAT3{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3] \\
bind\_gPoo\_stat\_37 &= [k37 \times gp130\_P{:}OSM{:}OSMR \times STAT3\_c] \\
unbind\_gPoo\_stat\_37 &= [km37 \times STAT3{:}gp130\_P{:}OSM{:}OSMR] \\
bind\_gooP\_stat\_38 &= [k38 \times gp130{:}OSM{:}OSMR\_P \times STAT3\_c] \\
unbind\_gooP\_stat\_38 &= [km38 \times gp130{:}OSM{:}OSMR\_P{:}STAT3] \\
bind\_gPooP\_stat\_39 &= [k39 \times gp130\_P{:}OSM{:}OSMR\_P \times STAT3\_c] \\
unbind\_gPooP\_stat\_39 &= [km39 \times STAT3{:}gp130\_P{:}OSM{:}OSMR\_P] \\
bind\_gPooP\_stat\_40 &= [k40 \times gp130\_P{:}OSM{:}OSMR\_P \times STAT3\_c] \\
unbind\_gPooP\_stat\_40 &= [km40 \times gp130\_P{:}OSM{:}OSMR\_P{:}STAT3] \\
bind\_sgPooP\_stat\_41 &= [k41 \times STAT3{:}gp130\_P{:}OSM{:}OSMR\_P \times STAT3\_c] \\
unbind\_sgPooP\_stat\_41 &= [km41 \times STAT3{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3] \\
bind\_gPooPs\_stat\_42 &= [k42 \times gp130\_P{:}OSM{:}OSMR\_P{:}STAT3 \times STAT3\_c] \\
unbind\_gPooPs\_stat\_42 &= [km42 \times STAT3{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3] \\
phospho\_stat\_sglls\_43 &= [k43 \times STAT3{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3] \\
phospho\_stat\_sglls\_44 &= [k44 \times STAT3{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3] \\
phospho\_stat\_sPglls\_45 &= [k45 \times STAT3\_P{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3] \\
phospho\_stat\_sgllsP\_46 &= [k46 \times STAT3{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3\_P] \\
phospho\_stat\_sgols\_47 &= [k47 \times STAT3{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3] \\
phospho\_stat\_sgols\_48 &= [k48 \times STAT3{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3] \\
phospho\_stat\_sPgols\_49 &= [k49 \times STAT3\_P{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3] \\
phospho\_stat\_sgolsP\_50 &= [k50 \times STAT3{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3\_P]
\end{aligned}
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\begin{aligned}
phospho\_stat\_sgoos\_51 &= [k51 \times STAT3{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3] \\
phospho\_stat\_sgoos\_52 &= [k52 \times STAT3{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3] \\
phospho\_stat\_sPgoos\_53 &= [k53 \times STAT3\_P{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3] \\
phospho\_stat\_sgoosP\_54 &= [k54 \times STAT3{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3\_P] \\
unbind\_s\_gll\_55 &= [k55 \times STAT3\_P{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3\_P] \\
unbind\_s\_gol\_56 &= [k56 \times STAT3\_P{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3\_P] \\
unbind\_s\_goo\_57 &= [k57 \times STAT3\_P{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3\_P] \\
reloc\_stat\_cn\_58 &= [(0.693/k58) \times STAT3\_PD\_c] \\
dephospho\_dedimer\_stat\_59 &= [k59 \times STAT3\_PD\_n] \\
reloc\_stat\_nc\_60 &= [(0.693/k60) \times STAT3\_n] \\
synth\_socs\_61 &= [k61 \times STAT3\_PD\_n] \\
bind\_gPll\_socs\_62 &= [k62 \times gp130\_P{:}LIF{:}LIFR \times SOCS3] \\
unbind\_gPll\_socs\_62 &= [km62 \times SOCS3{:}gp130\_P{:}LIF{:}LIFR] \\
bind\_gllP\_socs\_63 &= [k63 \times gp130{:}LIF{:}LIFR\_P \times SOCS3] \\
unbind\_gllP\_socs\_63 &= [km63 \times gp130{:}LIF{:}LIFR\_P{:}SOCS3] \\
bind\_gPllP\_socs\_64 &= [k64 \times gp130\_P{:}LIF{:}LIFR\_P \times SOCS3] \\
unbind\_gPllP\_socs\_64 &= [km64 \times SOCS3{:}gp130\_P{:}LIF{:}LIFR\_P] \\
bind\_gPllP\_socs\_65 &= [k65 \times gp130\_P{:}LIF{:}LIFR\_P \times SOCS3] \\
unbind\_gPllP\_socs\_65 &= [km65 \times gp130\_P{:}LIF{:}LIFR\_P{:}SOCS3] \\
bind\_sgPllP\_socs\_66 &= [k66 \times SOCS3{:}gp130\_P{:}LIF{:}LIFR\_P \times SOCS3] \\
unbind\_sgPllP\_socs\_66 &= [km66 \times SOCS3{:}gp130\_P{:}LIF{:}LIFR\_P{:}SOCS3] \\
bind\_gPllPs\_socs\_67 &= [k67 \times gp130\_P{:}LIF{:}LIFR\_P{:}SOCS3 \times SOCS3] \\
unbind\_gPllPs\_socs\_67 &= [km67 \times SOCS3{:}gp130\_P{:}LIF{:}LIFR\_P{:}SOCS3] \\
bind\_gPol\_socs\_68 &= [k68 \times gp130\_P{:}OSM{:}LIFR \times SOCS3] \\
unbind\_gPol\_socs\_68 &= [km68 \times SOCS3{:}gp130\_P{:}OSM{:}LIFR] \\
bind\_golP\_socs\_69 &= [k69 \times gp130{:}OSM{:}LIFR\_P \times SOCS3] \\
unbind\_golP\_socs\_69 &= [km69 \times gp130{:}OSM{:}LIFR\_P{:}SOCS3] \\
bind\_gPolP\_socs\_70 &= [k70 \times gp130\_P{:}OSM{:}LIFR\_P \times SOCS3] \\
unbind\_gPolP\_socs\_70 &= [km70 \times SOCS3{:}gp130\_P{:}OSM{:}LIFR\_P] \\
bind\_gPolP\_socs\_71 &= [k71 \times gp130\_P{:}OSM{:}LIFR\_P \times SOCS3] \\
unbind\_gPolP\_socs\_71 &= [km71 \times gp130\_P{:}OSM{:}LIFR\_P{:}SOCS3] \\
bind\_sgPolP\_socs\_72 &= [k72 \times SOCS3{:}gp130\_P{:}OSM{:}LIFR\_P \times SOCS3] \\
unbind\_sgPolP\_socs\_72 &= [km72 \times SOCS3{:}gp130\_P{:}OSM{:}LIFR\_P{:}SOCS3] \\
bind\_gPolPs\_socs\_73 &= [k73 \times gp130\_P{:}OSM{:}LIFR\_P{:}SOCS3 \times SOCS3] \\
unbind\_gPolPs\_socs\_73 &= [km73 \times SOCS3{:}gp130\_P{:}OSM{:}LIFR\_P{:}SOCS3] \\
bind\_gPoo\_socs\_74 &= [k74 \times gp130\_P{:}OSM{:}OSMR \times SOCS3] \\
unbind\_gPoo\_socs\_74 &= [km74 \times SOCS3{:}gp130\_P{:}OSM{:}OSMR] \\
bind\_gooP\_socs\_75 &= [k75 \times gp130{:}OSM{:}OSMR\_P \times SOCS3] \\
unbind\_gooP\_socs\_75 &= [km75 \times gp130{:}OSM{:}OSMR\_P{:}SOCS3]
\end{aligned}
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\begin{aligned}
bind\_gPooP\_socs\_76 &= [k76 \times gp130\_P{:}OSM{:}OSMR\_P \times SOCS3] \\
unbind\_gPooP\_socs\_76 &= [km76 \times SOCS3{:}gp130\_P{:}OSM{:}OSMR\_P] \\
bind\_gPooP\_socs\_77 &= [k77 \times gp130\_P{:}OSM{:}OSMR\_P \times SOCS3] \\
unbind\_gPooP\_socs\_77 &= [km77 \times gp130\_P{:}OSM{:}OSMR\_P{:}SOCS3] \\
bind\_sgPooP\_socs\_78 &= [k78 \times SOCS3{:}gp130\_P{:}OSM{:}OSMR\_P \times SOCS3] \\
unbind\_sgPooP\_socs\_78 &= [km78 \times SOCS3{:}gp130\_P{:}OSM{:}OSMR\_P{:}SOCS3] \\
bind\_gPooPs\_socs\_79 &= [k79 \times gp130\_P{:}OSM{:}OSMR\_P{:}SOCS3 \times SOCS3] \\
unbind\_gPooPs\_socs\_79 &= [km79 \times SOCS3{:}gp130\_P{:}OSM{:}OSMR\_P{:}SOCS3] \\
bind\_pias\_stat\_80 &= [k80 \times PIAS3 \times STAT3\_PD\_n] \\
unbind\_pias\_stat\_80 &= [km80 \times PIAS3{:}STAT3\_PD\_n] \\
degr\_socs\_81 &= [k81 \times SOCS3]
\end{aligned}
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\begin{aligned}
LIF &= bind\_gl\_l\_1{\downarrow} + bind\_ll\_g\_2{\downarrow} \\
gp130 &= bind\_gl\_l\_1{\downarrow} + bind\_go\_l\_3{\downarrow} + \\
&\quad bind\_go\_o\_6{\downarrow} + bind\_ll\_g\_2{\downarrow} + \\
&\quad bind\_lo\_g\_4{\downarrow} + bind\_oo\_g\_5{\downarrow} \\
LIFR &= bind\_ll\_g\_2{\downarrow} + bind\_lo\_g\_4{\downarrow} + \\
&\quad bind\_gl\_l\_1{\downarrow} + bind\_go\_l\_3{\downarrow} \\
OSM &= bind\_go\_l\_3{\downarrow} + bind\_lo\_g\_4{\downarrow} + \\
&\quad bind\_oo\_g\_5{\downarrow} + bind\_go\_o\_6{\downarrow} \\
OSMR &= bind\_oo\_g\_5{\downarrow} + bind\_go\_o\_6{\downarrow}
\end{aligned}
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\begin{aligned}
gp130{:}LIF{:}LIFR &= bind\_gl\_l\_1{\uparrow} + bind\_ll\_g\_2{\uparrow} + \\
&\quad phospho\_gll\_7{\downarrow} + phospho\_gll\_8{\downarrow} \\
gp130{:}OSM{:}LIFR &= bind\_go\_l\_3{\uparrow} + bind\_lo\_g\_4{\uparrow} + \\
&\quad phospho\_gol\_11{\downarrow} + phospho\_gol\_12{\downarrow} \\
gp130{:}OSM{:}OSMR &= bind\_oo\_g\_5{\uparrow} + bind\_go\_o\_6{\uparrow} + \\
&\quad phospho\_goo\_15{\downarrow} + phospho\_goo\_16{\downarrow}
\end{aligned}
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\begin{aligned}
gp130\_P{:}LIF{:}LIFR &= phospho\_gll\_7{\uparrow} + phospho\_gll\_9{\downarrow} + \\
&\quad bind\_gPll\_stat\_25{\downarrow} + unbind\_gPll\_stat\_25{\uparrow} + \\
&\quad bind\_gPll\_socs\_62{\downarrow} + unbind\_gPll\_socs\_62{\uparrow} \\
gp130{:}LIF{:}LIFR\_P &= phospho\_gll\_8{\uparrow} + phospho\_gll\_10{\downarrow} + \\
&\quad bind\_gllP\_stat\_26{\downarrow} + unbind\_gllP\_stat\_26{\uparrow} +
\end{aligned}
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\begin{aligned}
 & bind\_gllP\_socs\_63\downarrow + unbind\_gllP\_socs\_63\uparrow \\
gp130\_P{:}LIF{:}LIFR\_P = {} & phospho\_gll\_9\uparrow + phospho\_gll\_10\uparrow + \\
 & bind\_gPllP\_stat\_27\downarrow + unbind\_gPllP\_stat\_27\uparrow + \\
 & bind\_gPllP\_stat\_28\downarrow + unbind\_gPllP\_stat\_28\uparrow + \\
 & unbind\_s\_gll\_55\uparrow + bind\_gPllP\_socs\_64\downarrow + \\
 & unbind\_gPllP\_socs\_64\uparrow + bind\_gPllP\_socs\_65\downarrow + \\
 & unbind\_gPllP\_socs\_65\uparrow
\end{aligned}
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\begin{aligned}
gp130\_P{:}OSM{:}LIFR = {} & phospho\_gol\_11\uparrow + phospho\_gol\_13\downarrow + \\
 & bind\_gPol\_stat\_31\downarrow + unbind\_gPol\_stat\_31\uparrow + \\
 & bind\_gPol\_socs\_68\downarrow + unbind\_gPol\_socs\_68\uparrow \\
gp130{:}OSM{:}LIFR\_P = {} & phospho\_gol\_12\uparrow + phospho\_gol\_14\downarrow + \\
 & bind\_golP\_stat\_32\downarrow + unbind\_golP\_stat\_32\uparrow + \\
 & bind\_golP\_socs\_69\downarrow + unbind\_golP\_socs\_69\uparrow \\
gp130\_P{:}OSM{:}LIFR\_P = {} & phospho\_gol\_13\uparrow + phospho\_gol\_14\uparrow + \\
 & bind\_gPolP\_stat\_33\downarrow + unbind\_gPolP\_stat\_33\uparrow + \\
 & bind\_gPolP\_stat\_34\downarrow + unbind\_gPolP\_stat\_34\uparrow + \\
 & unbind\_s\_gol\_56\uparrow + bind\_gPolP\_socs\_70\downarrow + \\
 & unbind\_gPolP\_socs\_70\uparrow + bind\_gPolP\_socs\_71\downarrow + \\
 & unbind\_gPolP\_socs\_71\uparrow
\end{aligned}
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\begin{aligned}
gp130\_P{:}OSM{:}OSMR = {} & phospho\_goo\_15\uparrow + phospho\_goo\_17\downarrow + \\
 & bind\_gPoo\_stat\_37\downarrow + unbind\_gPoo\_stat\_37\uparrow + \\
 & bind\_gPoo\_socs\_74\downarrow + unbind\_gPoo\_socs\_74\uparrow \\
gp130{:}OSM{:}OSMR\_P = {} & phospho\_goo\_16\uparrow + phospho\_goo\_18\downarrow + \\
 & bind\_gooP\_stat\_38\downarrow + unbind\_gooP\_stat\_38\uparrow + \\
 & bind\_gooP\_socs\_75\downarrow + unbind\_gooP\_socs\_75\uparrow \\
gp130\_P{:}OSM{:}OSMR\_P = {} & phospho\_goo\_17\uparrow + phospho\_goo\_18\uparrow + \\
 & bind\_gPooP\_stat\_39\downarrow + unbind\_gPooP\_stat\_39\uparrow + \\
 & bind\_gPooP\_stat\_40\downarrow + unbind\_gPooP\_stat\_40\uparrow + \\
 & unbind\_s\_goo\_57\uparrow + bind\_gPooP\_socs\_76\downarrow + \\
 & unbind\_gPooP\_socs\_76\uparrow + bind\_gPooP\_socs\_77\downarrow + \\
 & unbind\_gPooP\_socs\_77\uparrow
\end{aligned}
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STAT3{:}gp130\_P{:}LIF{:}LIFR = bind\_gPll\_stat\_25\uparrow + unbind\_gPll\_stat\_25\downarrow +
$$

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\begin{aligned}
 & phospho\_sgll\_19\downarrow \\
gp130{:}LIF{:}LIFR\_P{:}STAT3 = & \; bind\_gllP\_stat\_26\uparrow + unbind\_gllP\_stat\_26\downarrow + \\
 & phospho\_glls\_20\downarrow \\
STAT3{:}gp130\_P{:}LIF{:}LIFR\_P = & \; bind\_gPllP\_stat\_27\uparrow + unbind\_gPllP\_stat\_27\downarrow + \\
 & bind\_sgPllP\_stat\_29\downarrow + unbind\_sgPllP\_stat\_29\uparrow + \\
 & phospho\_sgll\_19\uparrow \\
gp130\_P{:}LIF{:}LIFR\_P{:}STAT3 = & \; bind\_gPllP\_stat\_28\uparrow + unbind\_gPllP\_stat\_28\downarrow + \\
 & bind\_gPllPs\_stat\_30\downarrow + unbind\_gPllPs\_stat\_30\uparrow + \\
 & phospho\_glls\_20\uparrow \\
STAT3{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3 = & \; bind\_sgPllP\_stat\_29\uparrow + unbind\_sgPllP\_stat\_29\downarrow + \\
 & bind\_gPllPs\_stat\_30\uparrow + unbind\_gPllPs\_stat\_30\downarrow + \\
 & phospho\_stat\_sglls\_43\downarrow + phospho\_stat\_sglls\_44\downarrow
\end{aligned}
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\begin{aligned}
STAT3{:}gp130\_P{:}OSM{:}LIFR = & \; bind\_gPol\_stat\_31\uparrow + unbind\_gPol\_stat\_31\downarrow + \\
 & phospho\_sgol\_21\downarrow \\
gp130{:}OSM{:}LIFR\_P{:}STAT3 = & \; bind\_golP\_stat\_32\uparrow + unbind\_golP\_stat\_32\downarrow + \\
 & phospho\_gols\_22\downarrow \\
STAT3{:}gp130\_P{:}OSM{:}LIFR\_P = & \; bind\_gPolP\_stat\_33\uparrow + unbind\_gPolP\_stat\_33\downarrow + \\
 & bind\_sgPolP\_stat\_35\downarrow + unbind\_sgPolP\_stat\_35\uparrow + \\
 & phospho\_sgol\_21\uparrow \\
gp130\_P{:}OSM{:}LIFR\_P{:}STAT3 = & \; bind\_gPolP\_stat\_34\uparrow + unbind\_gPolP\_stat\_34\downarrow + \\
 & bind\_gPolPs\_stat\_36\downarrow + unbind\_gPolPs\_stat\_36\uparrow + \\
 & phospho\_gols\_22\uparrow \\
STAT3{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3 = & \; bind\_sgPolP\_stat\_35\uparrow + unbind\_sgPolP\_stat\_35\downarrow + \\
 & bind\_gPolPs\_stat\_36\uparrow + unbind\_gPolPs\_stat\_36\downarrow + \\
 & phospho\_stat\_sgols\_47\downarrow + phospho\_stat\_sgols\_48\downarrow
\end{aligned}
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\begin{aligned}
STAT3{:}gp130\_P{:}OSM{:}OSMR = & \; bind\_gPoo\_stat\_37\uparrow + unbind\_gPoo\_stat\_37\downarrow + \\
 & phospho\_sgoo\_23\downarrow \\
gp130{:}OSM{:}OSMR\_P{:}STAT3 = & \; bind\_gooP\_stat\_38\uparrow + unbind\_gooP\_stat\_38\downarrow + \\
 & phospho\_goos\_24\downarrow \\
STAT3{:}gp130\_P{:}OSM{:}OSMR\_P = & \; bind\_gPooP\_stat\_39\uparrow + unbind\_gPooP\_stat\_39\downarrow + \\
 & bind\_sgPooP\_stat\_41\downarrow + unbind\_sgPooP\_stat\_41\uparrow + \\
 & phospho\_sgoo\_23\uparrow \\
gp130\_P{:}OSM{:}OSMR\_P{:}STAT3 = & \; bind\_gPooP\_stat\_40\uparrow + unbind\_gPooP\_stat\_40\downarrow + \\
 & bind\_gPooPs\_stat\_42\downarrow + unbind\_gPooPs\_stat\_42\uparrow +
\end{aligned}
$$

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\begin{aligned}
STAT3{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3 = {} & phospho\_goos\_24\uparrow \\
& bind\_sgPooP\_stat\_41\uparrow + unbind\_sgPooP\_stat\_41\downarrow + \\
& bind\_gPooPs\_stat\_42\uparrow + unbind\_gPooPs\_stat\_42\downarrow + \\
& phospho\_stat\_sgoos\_51\downarrow + phospho\_stat\_sgoos\_52\downarrow
\end{aligned}
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\begin{aligned}
STAT3\_P{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3 &= phospho\_stat\_sglls\_43\uparrow + phospho\_stat\_sPglls\_45\downarrow \\
STAT3{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3\_P &= phospho\_stat\_sglls\_44\uparrow + phospho\_stat\_sgllsP\_46\downarrow \\
STAT3\_P{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3\_P &= phospho\_stat\_sPglls\_45\uparrow + phospho\_stat\_sgllsP\_46\uparrow + \\
& \quad unbind\_s\_gll\_55\downarrow
\end{aligned}
$$

$$
\begin{aligned}
STAT3\_P{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3 &= phospho\_stat\_sgols\_47\uparrow + phospho\_stat\_sPgols\_49\downarrow \\
STAT3{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3\_P &= phospho\_stat\_sgols\_48\uparrow + phospho\_stat\_sgolsP\_50\downarrow \\
STAT3\_P{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3\_P &= phospho\_stat\_sPgols\_49\uparrow + phospho\_stat\_sgolsP\_50\uparrow + \\
& \quad unbind\_s\_gol\_56\downarrow
\end{aligned}
$$

$$
\begin{aligned}
STAT3\_P{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3 &= phospho\_stat\_sgoos\_51\uparrow + phospho\_stat\_sPgoos\_53\downarrow \\
STAT3{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3\_P &= phospho\_stat\_sgoos\_52\uparrow + phospho\_stat\_sgoosP\_54\downarrow \\
STAT3\_P{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3\_P &= phospho\_stat\_sPgoos\_53\uparrow + phospho\_stat\_sgoosP\_54\uparrow + \\
& \quad unbind\_s\_goo\_57\downarrow
\end{aligned}
$$

$$
\begin{aligned}
STAT3\_c = {} & bind\_gPll\_stat\_25\downarrow + unbind\_gPll\_stat\_25\uparrow + \\
& bind\_gllP\_stat\_26\downarrow + unbind\_gllP\_stat\_26\uparrow + \\
& bind\_gPllP\_stat\_27\downarrow + unbind\_gPllP\_stat\_27\uparrow + \\
& bind\_gPllP\_stat\_28\downarrow + unbind\_gPllP\_stat\_28\uparrow + \\
& bind\_sgPllP\_stat\_29\downarrow + unbind\_sgPllP\_stat\_29\uparrow + \\
& bind\_gPllPs\_stat\_30\downarrow + unbind\_gPllPs\_stat\_30\uparrow + \\
& bind\_gPol\_stat\_31\downarrow + unbind\_gPol\_stat\_31\uparrow + \\
& bind\_golP\_stat\_32\downarrow + unbind\_golP\_stat\_32\uparrow + \\
& bind\_gPolP\_stat\_33\downarrow + unbind\_gPolP\_stat\_33\uparrow + \\
& bind\_gPolP\_stat\_34\downarrow + unbind\_gPolP\_stat\_34\uparrow + \\
& bind\_sgPolP\_stat\_35\downarrow + unbind\_sgPolP\_stat\_35\uparrow + \\
& bind\_gPolPs\_stat\_36\downarrow + unbind\_gPolPs\_stat\_36\uparrow +
\end{aligned}
$$

$$
\begin{aligned}
& bind\_gPoo\_stat\_37\downarrow + unbind\_gPoo\_stat\_37\uparrow + \\
& bind\_gooP\_stat\_38\downarrow + unbind\_gooP\_stat\_38\uparrow + \\
& bind\_gPooP\_stat\_39\downarrow + unbind\_gPooP\_stat\_39\uparrow + \\
& bind\_gPooP\_stat\_40\downarrow + unbind\_gPooP\_stat\_40\uparrow + \\
& bind\_sgPooP\_stat\_41\downarrow + unbind\_sgPooP\_stat\_41\uparrow + \\
& bind\_gPooPs\_stat\_42\downarrow + unbind\_gPooPs\_stat\_42\uparrow + \\
& reloc\_stat\_nc\_60\uparrow \\
STAT3\_PD\_c = \; & unbind\_s\_gll\_55\uparrow + unbind\_s\_gol\_56\uparrow + \\
& unbind\_s\_goo\_57\uparrow + reloc\_stat\_cn\_58\downarrow \\
STAT3\_PD\_n = \; & reloc\_stat\_cn\_58\uparrow + (synth\_socs\_61, 1) \oplus + \\
& dephospho\_dedimer\_stat\_59\downarrow + bind\_pias\_stat\_80\downarrow + unbind\_pias\_stat\_80\uparrow \\
STAT3\_n = \; & (dephospho\_dedimer\_stat\_59, 2)\uparrow + reloc\_stat\_nc\_60\downarrow
\end{aligned}
$$

$$
\begin{aligned}
SOCS3 = \; & synth\_socs\_61\uparrow + degr\_socs\_81\downarrow + \\
& bind\_gPll\_socs\_62\downarrow + unbind\_gPll\_socs\_62\uparrow + \\
& bind\_gllP\_socs\_63\downarrow + unbind\_gllP\_socs\_63\uparrow + \\
& bind\_gPllP\_socs\_64\downarrow + unbind\_gPllP\_socs\_64\uparrow + \\
& bind\_gPllP\_socs\_65\downarrow + unbind\_gPllP\_socs\_65\uparrow + \\
& bind\_sgPllP\_socs\_66\downarrow + unbind\_sgPllP\_socs\_66\uparrow + \\
& bind\_gPllPs\_socs\_67\downarrow + unbind\_gPllPs\_socs\_67\uparrow + \\
& bind\_gPol\_socs\_68\downarrow + unbind\_gPol\_socs\_68\uparrow + \\
& bind\_golP\_socs\_69\downarrow + unbind\_golP\_socs\_69\uparrow + \\
& bind\_gPolP\_socs\_70\downarrow + unbind\_gPolP\_socs\_70\uparrow + \\
& bind\_gPolP\_socs\_71\downarrow + unbind\_gPolP\_socs\_71\uparrow + \\
& bind\_sgPolP\_socs\_72\downarrow + unbind\_sgPolP\_socs\_72\uparrow + \\
& bind\_gPolPs\_socs\_73\downarrow + unbind\_gPolPs\_socs\_73\uparrow + \\
& bind\_gPoo\_socs\_74\downarrow + unbind\_gPoo\_socs\_74\uparrow + \\
& bind\_gooP\_socs\_75\downarrow + unbind\_gooP\_socs\_75\uparrow + \\
& bind\_gPooP\_socs\_76\downarrow + unbind\_gPooP\_socs\_76\uparrow + \\
& bind\_gPooP\_socs\_77\downarrow + unbind\_gPooP\_socs\_77\uparrow + \\
& bind\_sgPooP\_socs\_78\downarrow + unbind\_sgPooP\_socs\_78\uparrow + \\
& bind\_gPooPs\_socs\_79\downarrow + unbind\_gPooPs\_socs\_79\uparrow
\end{aligned}
$$

$$
\begin{aligned}
SOCS3{:}gp130\_P{:}LIF{:}LIFR &= bind\_gPll\_socs\_62\uparrow + unbind\_gPll\_socs\_62\downarrow \\
gp130{:}LIF{:}LIFR\_P{:}SOCS3 &= bind\_gllP\_socs\_63\uparrow + unbind\_gllP\_socs\_63\downarrow \\
SOCS3{:}gp130\_P{:}LIF{:}LIFR\_P &= bind\_gPllP\_socs\_64\uparrow + unbind\_gPllP\_socs\_64\downarrow +
\end{aligned}
$$

$$
\begin{aligned}
& bind\_sgPllP\_socs\_66\downarrow + unbind\_sgPllP\_socs\_66\uparrow \\
gp130\_P{:}LIF{:}LIFR\_P{:}SOCS3 = \; & bind\_gPllP\_socs\_65\uparrow + unbind\_gPllP\_socs\_65\downarrow + \\
& bind\_gPllPs\_socs\_67\downarrow + unbind\_gPllPs\_socs\_67\uparrow \\
SOCS3{:}gp130\_P{:}LIF{:}LIFR\_P{:}SOCS3 = \; & bind\_sgPllP\_socs\_66\uparrow + unbind\_sgPllP\_socs\_66\downarrow + \\
& bind\_gPllPs\_socs\_67\uparrow + unbind\_gPllPs\_socs\_67\downarrow
\end{aligned}
$$

$$
\begin{aligned}
SOCS3{:}gp130\_P{:}OSM{:}LIFR = \; & bind\_gPol\_socs\_68\uparrow + unbind\_gPol\_socs\_68\downarrow \\
gp130{:}OSM{:}LIFR\_P{:}SOCS3 = \; & bind\_golP\_socs\_69\uparrow + unbind\_golP\_socs\_69\downarrow \\
SOCS3{:}gp130\_P{:}OSM{:}LIFR\_P = \; & bind\_gPolP\_socs\_70\uparrow + unbind\_gPolP\_socs\_70\downarrow + \\
& bind\_sgPolP\_socs\_72\downarrow + unbind\_sgPolP\_socs\_72\uparrow \\
gp130\_P{:}OSM{:}LIFR\_P{:}SOCS3 = \; & bind\_gPolP\_socs\_71\uparrow + unbind\_gPolP\_socs\_71\downarrow + \\
& bind\_gPolPs\_socs\_73\downarrow + unbind\_gPolPs\_socs\_73\uparrow \\
SOCS3{:}gp130\_P{:}OSM{:}LIFR\_P{:}SOCS3 = \; & bind\_sgPolP\_socs\_72\uparrow + unbind\_sgPolP\_socs\_72\downarrow + \\
& bind\_gPolPs\_socs\_73\uparrow + unbind\_gPolPs\_socs\_73\downarrow
\end{aligned}
$$

$$
\begin{aligned}
SOCS3{:}gp130\_P{:}OSM{:}OSMR = \; & bind\_gPoo\_socs\_74\uparrow + unbind\_gPoo\_socs\_74\downarrow \\
gp130{:}OSM{:}OSMR\_P{:}SOCS3 = \; & bind\_gooP\_socs\_75\uparrow + unbind\_gooP\_socs\_75\downarrow \\
SOCS3{:}gp130\_P{:}OSM{:}OSMR\_P = \; & bind\_gPooP\_socs\_76\uparrow + unbind\_gPooP\_socs\_76\downarrow + \\
& bind\_sgPooP\_socs\_78\downarrow + unbind\_sgPooP\_socs\_78\uparrow \\
gp130\_P{:}OSM{:}OSMR\_P{:}SOCS3 = \; & bind\_gPooP\_socs\_77\uparrow + unbind\_gPooP\_socs\_77\downarrow + \\
& bind\_gPooPs\_socs\_79\downarrow + unbind\_gPooPs\_socs\_79\uparrow \\
SOCS3{:}gp130\_P{:}OSM{:}OSMR\_P{:}SOCS3 = \; & bind\_sgPooP\_socs\_78\uparrow + unbind\_sgPooP\_socs\_78\downarrow + \\
& bind\_gPooPs\_socs\_79\uparrow + unbind\_gPooPs\_socs\_79\downarrow
\end{aligned}
$$

$$
\begin{aligned}
PIAS3 = \; & bind\_pias\_stat\_80\downarrow + unbind\_pias\_stat\_80\uparrow \\
PIAS3{:}STAT3\_PD\_n = \; & bind\_pias\_stat\_80\uparrow + unbind\_pias\_stat\_80\downarrow \\
res = \; & (degr\_socs\_81, 1) \odot
\end{aligned}
$$

$LIF \| gp130 \| LIFR \| OSM \| OSMR \| gp130{:}LIF{:}LIFR \| gp130{:}OSM{:}LIFR \| gp130{:}OSM{:}OSMR \|$
$gp130\_P{:}LIF{:}LIFR \| gp130{:}LIF{:}LIFR\_P \| gp130\_P{:}LIF{:}LIFR\_P \| gp130\_P{:}OSM{:}LIFR \|$
$gp130{:}OSM{:}LIFR\_P \| gp130\_P{:}OSM{:}LIFR\_P \| gp130\_P{:}OSM{:}OSMR \| gp130{:}OSM{:}OSMR\_P \|$
$gp130\_P{:}OSM{:}OSMR\_P \| STAT3{:}gp130\_P{:}LIF{:}LIFR\_P \| gp130\_P{:}LIF{:}LIFR\_P{:}STAT3 \|$
$STAT3{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3 \| STAT3{:}gp130\_P{:}OSM{:}LIFR\_P \| gp130\_P{:}OSM{:}LIFR\_P{:}STAT3 \|$
$STAT3{:}gp130\_P{:}OSM{:}LIFR\_P{:}STAT3 \| STAT3{:}gp130\_P{:}OSM{:}OSMR\_P \| gp130\_P{:}OSM{:}OSMR\_P{:}STAT3 \|$
$STAT3{:}gp130\_P{:}OSM{:}OSMR\_P{:}STAT3 \| STAT3\_P{:}gp130\_P{:}LIF{:}LIFR\_P{:}STAT3 \|$

STAT3:gp130_P:LIF:LIFR_P:STAT3_P‖STAT3_P:gp130_P:LIF:LIFR_P:STAT3_P‖
STAT3_P:gp130_P:OSM:LIFR_P:STAT3‖STAT3:gp130_P:OSM:LIFR_P:STAT3_P‖
STAT3_P:gp130_P:OSM:LIFR_P:STAT3_P‖STAT3_P:gp130_P:OSM:OSMR_P:STAT3‖
STAT3:gp130_P:OSM:OSMR_P:STAT3_P‖STAT3_P:gp130_P:OSM:OSMR_P:STAT3_P‖
STAT3_c‖STAT3_PD_c‖STAT3_PD_n‖STAT3_n‖SOCS3‖SOCS3:gp130_P:LIF:LIFR‖
gp130:LIF:LIFR_P:SOCS3‖SOCS3:gp130_P:LIF:LIFR_P‖gp130_P:LIF:LIFR_P:SOCS3‖
SOCS3:gp130_P:LIF:LIFR_P:SOCS3‖SOCS3:gp130_P:OSM:LIFR‖gp130:OSM:LIFR_P:SOCS3‖
SOCS3:gp130_P:OSM:LIFR_P‖gp130_P:OSM:LIFR_P:SOCS3‖SOCS3:gp130_P:OSM:LIFR_P:SOCS3‖
SOCS3:gp130_P:OSM:OSMR‖gp130:OSM:OSMR_P:SOCS3‖SOCS3:gp130_P:OSM:OSMR_P‖
gp130_P:OSM:OSMR_P:SOCS3‖SOCS3:gp130_P:OSM:OSMR_P:SOCS3‖PIAS3‖
PIAS3:STAT3_PD_n‖STAT3:gp130_P:LIF:LIFR‖gp130:LIF:LIFR_P:STAT3‖
STAT3:gp130_P:OSM:LIFR‖gp130:OSM:LIFR_P:STAT3‖
STAT3:gp130_P:OSM:OSMR‖gp130:OSM:OSMR_P:STAT3‖res

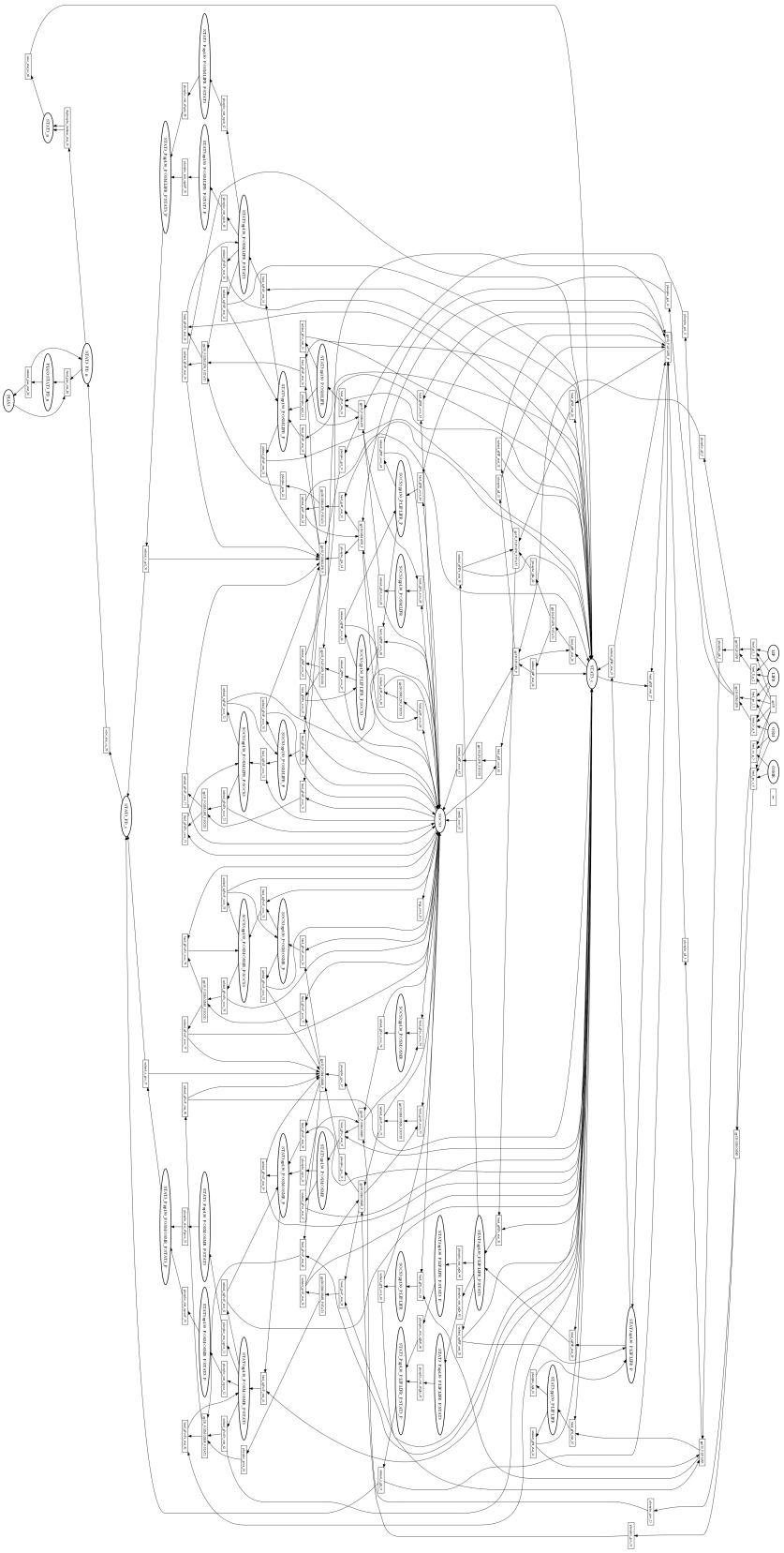

Fig. 1. Reaction network

A Dizzy generated file

```
// Dizzy model generated by the BioPEPA Workbench

#model "_gp130_STAT_exp_all001";

LIF = 3000;
gp130 = 1000;
LIFR = 1000;
OSM = 3000;
OSMR = 1000;
gp130_colon_LIF_colon_LIFR = 0;
gp130_colon_OSM_colon_LIFR = 0;
gp130_colon_OSM_colon_OSMR = 0;
gp130_P_colon_LIF_colon_LIFR = 0;
gp130_colon_LIF_colon_LIFR_P = 0;
gp130_P_colon_LIF_colon_LIFR_P = 0;
gp130_P_colon_OSM_colon_LIFR = 0;
gp130_colon_OSM_colon_LIFR_P = 0;
gp130_P_colon_OSM_colon_LIFR_P = 0;
gp130_P_colon_OSM_colon_OSMR = 0;
gp130_colon_OSM_colon_OSMR_P = 0;
gp130_P_colon_OSM_colon_OSMR_P = 0;
STAT3_colon_gp130_P_colon_LIF_colon_LIFR = 0;
gp130_colon_LIF_colon_LIFR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P = 0;
gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_OSM_colon_LIFR = 0;
gp130_colon_OSM_colon_LIFR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P = 0;
gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_OSM_colon_OSMR = 0;
gp130_colon_OSM_colon_OSMR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P = 0;
gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 = 0;
STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P = 0;
STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P = 0;
STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P = 0;
STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P = 0;
STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 = 0;
STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P = 0;
STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P = 0;
STAT3_c = 3000;
STAT3_PD_c = 0;
STAT3_PD_n = 0;
```

```
STAT3_n = 0;
SOCS3 = 0;
SOCS3_colon_gp130_P_colon_LIF_colon_LIFR = 0;
gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 = 0;
SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P = 0;
gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 = 0;
SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 = 0;
SOCS3_colon_gp130_P_colon_OSM_colon_LIFR = 0;
gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 = 0;
SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P = 0;
gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 = 0;
SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 = 0;
SOCS3_colon_gp130_P_colon_OSM_colon_OSMR = 0;
gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 = 0;
SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P = 0;
gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 = 0;
SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 = 0;
PIAS3 = 1000;
PIAS3_colon_STAT3_PD_n = 0;
res = 1;
k1 = 0.000000804583443684188;
k2 = 0.00000804583443684188;
k3 = 0.00000804583443684188;
k4 = 0.000000804583443684188;
k5 = 0.00000804583443684188;
k6 = 0.00000804583443684188;
k7 = 0.2;
k8 = 0.2;
k9 = 0.2;
k10 = 0.2;
k11 = 0.2;
k12 = 0.2;
k13 = 0.2;
k14 = 0.2;
k15 = 0.2;
k16 = 0.2;
k17 = 0.2;
k18 = 0.2;
k19 = 0.2;
k20 = 0.2;
k21 = 0.2;
k22 = 0.2;
k23 = 0.2;
k24 = 0.2;
k25 = 0.000381503441478962;
km25 = 0.06;
k26 = 0.000381503441478962;
km26 = 0.06;
k27 = 0.000381503441478962;
km27 = 0.06;
```

```
k28 = 0.000381503441478962;
km28 = 0.06;
k29 = 0.000381503441478962;
km29 = 0.06;
k30 = 0.000381503441478962;
km30 = 0.06;
k31 = 0.000381503441478962;
km31 = 0.06;
k32 = 0.000381503441478962;
km32 = 0.06;
k33 = 0.000381503441478962;
km33 = 0.06;
k34 = 0.000381503441478962;
km34 = 0.06;
k35 = 0.000381503441478962;
km35 = 0.06;
k36 = 0.000381503441478962;
km36 = 0.06;
k37 = 0.000381503441478962;
km37 = 0.06;
k38 = 0.000381503441478962;
km38 = 0.06;
k39 = 0.000381503441478962;
km39 = 0.06;
k40 = 0.000381503441478962;
km40 = 0.06;
k41 = 0.000381503441478962;
km41 = 0.06;
k42 = 0.000381503441478962;
km42 = 0.06;
k43 = 0.2;
k44 = 0.2;
k45 = 0.2;
k46 = 0.2;
k47 = 0.2;
k48 = 0.2;
k49 = 0.2;
k50 = 0.2;
k51 = 0.2;
k52 = 0.2;
k53 = 0.2;
k54 = 0.2;
k55 = 1E+308;
k56 = 1E+308;
k57 = 1E+308;
k58 = 1;
k59 = 0.02;
k60 = 15;
k61 = 0.05;
k62 = 0.0000476879301848702;
```

```
km62 = 0.006;
k63 = 0.0000476879301848702;
km63 = 0.006;
k64 = 0.0000476879301848702;
km64 = 0.006;
k65 = 0.0000476879301848702;
km65 = 0.006;
k66 = 0.0000476879301848702;
km66 = 0.006;
k67 = 0.0000476879301848702;
km67 = 0.006;
k68 = 0.0000476879301848702;
km68 = 0.006;
k69 = 0.0000476879301848702;
km69 = 0.006;
k70 = 0.0000476879301848702;
km70 = 0.006;
k71 = 0.0000476879301848702;
km71 = 0.006;
k72 = 0.0000476879301848702;
km72 = 0.006;
k73 = 0.0000476879301848702;
km73 = 0.006;
k74 = 0.0000476879301848702;
km74 = 0.006;
k75 = 0.0000476879301848702;
km75 = 0.006;
k76 = 0.0000476879301848702;
km76 = 0.006;
k77 = 0.0000476879301848702;
km77 = 0.006;
k78 = 0.0000476879301848702;
km78 = 0.006;
k79 = 0.0000476879301848702;
km79 = 0.006;
k80 = 0.000664451827242525;
km80 = 0.4;
k81 = 0.01;
exosol = 0.00000000000991;
cellMembrane = 0.000000126;
cytosol = 0.00000000000209;
nucleus = 0.00000000000025;
na = 6.02E+023;

"bind_gl_l_1", LIF + gp130 + LIFR -> gp130_colon_LIF_colon_LIFR, [k1 * gp130 * LIF * LIFR ] ;
"bind_ll_g_2", LIF + gp130 + LIFR -> gp130_colon_LIF_colon_LIFR, [k2 * LIFR * LIF * gp130 ] ;
"bind_go_l_3", gp130 + LIFR + OSM -> gp130_colon_OSM_colon_LIFR, [k3 * gp130 * OSM * LIFR ] ;
"bind_lo_g_4", gp130 + LIFR + OSM -> gp130_colon_OSM_colon_LIFR, [k4 * LIFR * OSM * gp130 ] ;
"bind_oo_g_5", gp130 + OSM + OSMR -> gp130_colon_OSM_colon_OSMR, [k5 * OSMR * OSM * gp130 ] ;
"bind_go_o_6", gp130 + OSM + OSMR -> gp130_colon_OSM_colon_OSMR, [k6 * gp130 * OSM * OSMR ] ;
```

```
"phospho_gll_7", gp130_colon_LIF_colon_LIFR ->
                 gp130_P_colon_LIF_colon_LIFR, [k7 * gp130_colon_LIF_colon_LIFR ] ;
"phospho_gll_8", gp130_colon_LIF_colon_LIFR ->
                 gp130_colon_LIF_colon_LIFR_P, [k8 * gp130_colon_LIF_colon_LIFR ] ;
"phospho_gll_9", gp130_P_colon_LIF_colon_LIFR ->
                 gp130_P_colon_LIF_colon_LIFR_P, [k9 * gp130_P_colon_LIF_colon_LIFR ] ;
"phospho_gll_10", gp130_colon_LIF_colon_LIFR_P ->
                 gp130_P_colon_LIF_colon_LIFR_P, [k10 * gp130_colon_LIF_colon_LIFR_P ] ;
"phospho_gol_11", gp130_colon_OSM_colon_LIFR ->
                 gp130_P_colon_OSM_colon_LIFR, [k11 * gp130_colon_OSM_colon_LIFR ] ;
"phospho_gol_12", gp130_colon_OSM_colon_LIFR ->
                 gp130_colon_OSM_colon_LIFR_P, [k12 * gp130_colon_OSM_colon_LIFR ] ;
"phospho_gol_13", gp130_P_colon_OSM_colon_LIFR ->
                 gp130_P_colon_OSM_colon_LIFR_P, [k13 * gp130_P_colon_OSM_colon_LIFR ] ;
"phospho_gol_14", gp130_colon_OSM_colon_LIFR_P ->
                 gp130_P_colon_OSM_colon_LIFR_P, [k14 * gp130_colon_OSM_colon_LIFR_P ] ;
"phospho_goo_15", gp130_colon_OSM_colon_OSMR ->
                 gp130_P_colon_OSM_colon_OSMR, [k15 * gp130_colon_OSM_colon_OSMR ] ;
"phospho_goo_16", gp130_colon_OSM_colon_OSMR ->
                 gp130_colon_OSM_colon_OSMR_P, [k16 * gp130_colon_OSM_colon_OSMR ] ;
"phospho_goo_17", gp130_P_colon_OSM_colon_OSMR ->
                 gp130_P_colon_OSM_colon_OSMR_P, [k17 * gp130_P_colon_OSM_colon_OSMR ] ;
"phospho_goo_18", gp130_colon_OSM_colon_OSMR_P ->
                 gp130_P_colon_OSM_colon_OSMR_P, [k18 * gp130_colon_OSM_colon_OSMR_P ] ;
"phospho_sgll_19", STAT3_colon_gp130_P_colon_LIF_colon_LIFR ->
                 STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P,
                 [k19 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR ] ;
"phospho_glls_20", gp130_colon_LIF_colon_LIFR_P_colon_STAT3 ->
                 gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3,
                 [k20 * gp130_colon_LIF_colon_LIFR_P_colon_STAT3 ] ;
"phospho_sgol_21", STAT3_colon_gp130_P_colon_OSM_colon_LIFR ->
                 STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P,
                 [k21 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR ] ;
"phospho_gols_22", gp130_colon_OSM_colon_LIFR_P_colon_STAT3 ->
                 gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3,
                 [k22 * gp130_colon_OSM_colon_LIFR_P_colon_STAT3 ] ;
"phospho_sgoo_23", STAT3_colon_gp130_P_colon_OSM_colon_OSMR ->
                 STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P,
                 [k23 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR ] ;
"phospho_goos_24", gp130_colon_OSM_colon_OSMR_P_colon_STAT3 ->
                 gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3,
                 [k24 * gp130_colon_OSM_colon_OSMR_P_colon_STAT3 ] ;
"bind_gPll_stat_25", gp130_P_colon_LIF_colon_LIFR + STAT3_c ->
                 STAT3_colon_gp130_P_colon_LIF_colon_LIFR,
                 [k25 * gp130_P_colon_LIF_colon_LIFR * STAT3_c ] ;
"unbind_gPll_stat_25", STAT3_colon_gp130_P_colon_LIF_colon_LIFR ->
                 gp130_P_colon_LIF_colon_LIFR + STAT3_c,
                 [km25 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR ] ;
"bind_gllP_stat_26", gp130_colon_LIF_colon_LIFR_P + STAT3_c ->
                 gp130_colon_LIF_colon_LIFR_P_colon_STAT3,
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                [k26 * gp130_colon_LIF_colon_LIFR_P * STAT3_c ] ;
"unbind_gllP_stat_26", gp130_colon_LIF_colon_LIFR_P_colon_STAT3 ->
                gp130_colon_LIF_colon_LIFR_P + STAT3_c,
                [km26 * gp130_colon_LIF_colon_LIFR_P_colon_STAT3 ] ;
"bind_gPllP_stat_27", gp130_P_colon_LIF_colon_LIFR_P + STAT3_c ->
                STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P,
                [k27 * gp130_P_colon_LIF_colon_LIFR_P * STAT3_c ] ;
"unbind_gPllP_stat_27", STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P ->
                gp130_P_colon_LIF_colon_LIFR_P + STAT3_c,
                [km27 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P ] ;
"bind_gPllP_stat_28", gp130_P_colon_LIF_colon_LIFR_P + STAT3_c ->
                gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3,
                [k28 * gp130_P_colon_LIF_colon_LIFR_P * STAT3_c ] ;
"unbind_gPllP_stat_28", gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ->
                gp130_P_colon_LIF_colon_LIFR_P + STAT3_c,
                [km28 * gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ] ;
"bind_sgPllP_stat_29", STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P + STAT3_c ->
                STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3,
                [k29 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P * STAT3_c ] ;
"unbind_sgPllP_stat_29", STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ->
                STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P + STAT3_c,
                [km29 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ] ;
"bind_gPllPs_stat_30", gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + STAT3_c ->
                STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3,
                [k30 * gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 * STAT3_c ] ;
"unbind_gPllPs_stat_30", STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ->
                gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + STAT3_c,
                [km30 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ] ;
"bind_gPol_stat_31", gp130_P_colon_OSM_colon_LIFR + STAT3_c ->
                STAT3_colon_gp130_P_colon_OSM_colon_LIFR,
                [k31 * gp130_P_colon_OSM_colon_LIFR * STAT3_c ] ;
"unbind_gPol_stat_31", STAT3_colon_gp130_P_colon_OSM_colon_LIFR ->
                gp130_P_colon_OSM_colon_LIFR + STAT3_c,
                [km31 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR ] ;
"bind_golP_stat_32", gp130_colon_OSM_colon_LIFR_P + STAT3_c ->
                gp130_colon_OSM_colon_LIFR_P_colon_STAT3,
                [k32 * gp130_colon_OSM_colon_LIFR_P * STAT3_c ] ;
"unbind_golP_stat_32", gp130_colon_OSM_colon_LIFR_P_colon_STAT3 ->
                gp130_colon_OSM_colon_LIFR_P + STAT3_c,
                [km32 * gp130_colon_OSM_colon_LIFR_P_colon_STAT3 ] ;
"bind_gPolP_stat_33", gp130_P_colon_OSM_colon_LIFR_P + STAT3_c ->
                STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P,
                [k33 * gp130_P_colon_OSM_colon_LIFR_P * STAT3_c ] ;
"unbind_gPolP_stat_33", STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P ->
                gp130_P_colon_OSM_colon_LIFR_P + STAT3_c,
                [km33 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P ] ;
"bind_gPolP_stat_34", gp130_P_colon_OSM_colon_LIFR_P + STAT3_c ->
                gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3,
                [k34 * gp130_P_colon_OSM_colon_LIFR_P * STAT3_c ] ;
"unbind_gPolP_stat_34", gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ->
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                gp130_P_colon_OSM_colon_LIFR_P + STAT3_c,
                [km34 * gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ] ;
"bind_sgPolP_stat_35", STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P + STAT3_c ->
                STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3,
                [k35 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P * STAT3_c ] ;
"unbind_sgPolP_stat_35", STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ->
                STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P + STAT3_c,
                [km35 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ] ;
"bind_gPolPs_stat_36", gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + STAT3_c ->
                STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3,
                [k36 * gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 * STAT3_c ] ;
"unbind_gPolPs_stat_36", STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ->
                gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + STAT3_c,
                [km36 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ] ;
"bind_gPoo_stat_37", gp130_P_colon_OSM_colon_OSMR + STAT3_c ->
                STAT3_colon_gp130_P_colon_OSM_colon_OSMR,
                [k37 * gp130_P_colon_OSM_colon_OSMR * STAT3_c ] ;
"unbind_gPoo_stat_37", STAT3_colon_gp130_P_colon_OSM_colon_OSMR ->
                gp130_P_colon_OSM_colon_OSMR + STAT3_c,
                [km37 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR ] ;
"bind_gooP_stat_38", gp130_colon_OSM_colon_OSMR_P + STAT3_c ->
                gp130_colon_OSM_colon_OSMR_P_colon_STAT3,
                [k38 * gp130_colon_OSM_colon_OSMR_P * STAT3_c ] ;
"unbind_gooP_stat_38", gp130_colon_OSM_colon_OSMR_P_colon_STAT3 ->
                gp130_colon_OSM_colon_OSMR_P + STAT3_c,
                [km38 * gp130_colon_OSM_colon_OSMR_P_colon_STAT3 ] ;
"bind_gPooP_stat_39", gp130_P_colon_OSM_colon_OSMR_P + STAT3_c ->
                STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P,
                [k39 * gp130_P_colon_OSM_colon_OSMR_P * STAT3_c ] ;
"unbind_gPooP_stat_39", STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P ->
                gp130_P_colon_OSM_colon_OSMR_P + STAT3_c,
                [km39 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P ] ;
"bind_gPooP_stat_40", gp130_P_colon_OSM_colon_OSMR_P + STAT3_c ->
                gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3,
                [k40 * gp130_P_colon_OSM_colon_OSMR_P * STAT3_c ] ;
"unbind_gPooP_stat_40", gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ->
                gp130_P_colon_OSM_colon_OSMR_P + STAT3_c,
                [km40 * gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ] ;
"bind_sgPooP_stat_41", STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P + STAT3_c ->
                STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3,
                [k41 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P * STAT3_c ] ;
"unbind_sgPooP_stat_41", STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ->
                STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P + STAT3_c,
                [km41 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ] ;
"bind_gPooPs_stat_42", gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + STAT3_c ->
                STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3,
                [k42 * gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 * STAT3_c ] ;
"unbind_gPooPs_stat_42", STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ->
                gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + STAT3_c,
                [km42 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ] ;
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"phospho_stat_sglls_43", STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ->
                STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3,
                [k43 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ] ;
"phospho_stat_sglls_44", STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ->
                STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P,
                [k44 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ] ;
"phospho_stat_sPglls_45", STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ->
                STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P,
                [k45 * STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ] ;
"phospho_stat_sgllsP_46", STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P ->
                STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P,
                [k46 * STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P ] ;
"phospho_stat_sgols_47", STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ->
                STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3,
                [k47 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ] ;
"phospho_stat_sgols_48", STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ->
                STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P,
                [k48 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ] ;
"phospho_stat_sPgols_49", STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ->
                STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P,
                [k49 * STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ] ;
"phospho_stat_sgolsP_50", STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P ->
                STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P,
                [k50 * STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P ] ;
"phospho_stat_sgoos_51", STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ->
                STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3,
                [k51 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ] ;
"phospho_stat_sgoos_52", STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ->
                STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P,
                [k52 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ] ;
"phospho_stat_sPgoos_53", STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ->
                STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P,
                [k53 * STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ] ;
"phospho_stat_sgoosP_54", STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P ->
                STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P,
                [k54 * STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P ] ;
"unbind_s_gll_55", STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P ->
                gp130_P_colon_LIF_colon_LIFR_P + STAT3_PD_c,
                [k55 * STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P ] ;
"unbind_s_gol_56", STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P ->
                gp130_P_colon_OSM_colon_LIFR_P + STAT3_PD_c,
                [k56 * STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P ] ;
"unbind_s_goo_57", STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P ->
                gp130_P_colon_OSM_colon_OSMR_P + STAT3_PD_c,
                [k57 * STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P ] ;
"reloc_stat_cn_58", STAT3_PD_c -> STAT3_PD_n, [(0.693 / k58) * STAT3_PD_c ] ;
"dephospho_dedimer_stat_59", STAT3_PD_n -> STAT3_n + STAT3_n, [k59 * STAT3_PD_n ] ;
"reloc_stat_nc_60", STAT3_n -> STAT3_c, [(0.693 / k60) * STAT3_n ] ;
"synth_socs_61",  -> SOCS3, [k61 * STAT3_PD_n ] ;
"bind_gPll_socs_62", gp130_P_colon_LIF_colon_LIFR + SOCS3 ->
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                SOCS3_colon_gp130_P_colon_LIF_colon_LIFR,
                [k62 * gp130_P_colon_LIF_colon_LIFR * SOCS3 ] ;
"unbind_gPll_socs_62", SOCS3_colon_gp130_P_colon_LIF_colon_LIFR ->
                gp130_P_colon_LIF_colon_LIFR + SOCS3,
                [km62 * SOCS3_colon_gp130_P_colon_LIF_colon_LIFR ] ;
"bind_gllP_socs_63", gp130_colon_LIF_colon_LIFR_P + SOCS3 ->
                gp130_colon_LIF_colon_LIFR_P_colon_SOCS3,
                [k63 * gp130_colon_LIF_colon_LIFR_P * SOCS3 ] ;
"unbind_gllP_socs_63", gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 ->
                gp130_colon_LIF_colon_LIFR_P + SOCS3,
                [km63 * gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 ] ;
"bind_gPllP_socs_64", gp130_P_colon_LIF_colon_LIFR_P + SOCS3 ->
                SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P,
                [k64 * gp130_P_colon_LIF_colon_LIFR_P * SOCS3 ] ;
"unbind_gPllP_socs_64", SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P ->
                gp130_P_colon_LIF_colon_LIFR_P + SOCS3,
                [km64 * SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P ] ;
"bind_gPllP_socs_65", gp130_P_colon_LIF_colon_LIFR_P + SOCS3 ->
                gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3,
                [k65 * gp130_P_colon_LIF_colon_LIFR_P * SOCS3 ] ;
"unbind_gPllP_socs_65", gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ->
                gp130_P_colon_LIF_colon_LIFR_P + SOCS3,
                [km65 * gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ] ;
"bind_sgPllP_socs_66", SOCS3 + SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P ->
                SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3,
                [k66 * SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P * SOCS3 ] ;
"unbind_sgPllP_socs_66", SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ->
                SOCS3 + SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P,
                [km66 * SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ] ;
"bind_gPllPs_socs_67", SOCS3 + gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ->
                SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3,
                [k67 * gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 * SOCS3 ] ;
"unbind_gPllPs_socs_67", SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ->
                SOCS3 + gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3,
                [km67 * SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ] ;
"bind_gPol_socs_68", gp130_P_colon_OSM_colon_LIFR + SOCS3 ->
                SOCS3_colon_gp130_P_colon_OSM_colon_LIFR,
                [k68 * gp130_P_colon_OSM_colon_LIFR * SOCS3 ] ;
"unbind_gPol_socs_68", SOCS3_colon_gp130_P_colon_OSM_colon_LIFR ->
                gp130_P_colon_OSM_colon_LIFR + SOCS3,
                [km68 * SOCS3_colon_gp130_P_colon_OSM_colon_LIFR ] ;
"bind_golP_socs_69", gp130_colon_OSM_colon_LIFR_P + SOCS3 ->
                gp130_colon_OSM_colon_LIFR_P_colon_SOCS3,
                [k69 * gp130_colon_OSM_colon_LIFR_P * SOCS3 ] ;
"unbind_golP_socs_69", gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 ->
                gp130_colon_OSM_colon_LIFR_P + SOCS3,
                [km69 * gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 ] ;
"bind_gPolP_socs_70", gp130_P_colon_OSM_colon_LIFR_P + SOCS3 ->
                SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P,
                [k70 * gp130_P_colon_OSM_colon_LIFR_P * SOCS3 ] ;
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"unbind_gPolP_socs_70", SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P ->
                gp130_P_colon_OSM_colon_LIFR_P + SOCS3,
                [km70 * SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P ] ;
"bind_gPolP_socs_71", gp130_P_colon_OSM_colon_LIFR_P + SOCS3 ->
                gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3,
                [k71 * gp130_P_colon_OSM_colon_LIFR_P * SOCS3 ] ;
"unbind_gPolP_socs_71", gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ->
                gp130_P_colon_OSM_colon_LIFR_P + SOCS3,
                [km71 * gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ] ;
"bind_sgPolP_socs_72", SOCS3 + SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P ->
                SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3,
                [k72 * SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P * SOCS3 ] ;
"unbind_sgPolP_socs_72", SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ->
                SOCS3 + SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P,
                [km72 * SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ] ;
"bind_gPolPs_socs_73", SOCS3 + gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ->
                SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3,
                [k73 * gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 * SOCS3 ] ;
"unbind_gPolPs_socs_73", SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ->
                SOCS3 + gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3,
                [km73 * SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ] ;
"bind_gPoo_socs_74", gp130_P_colon_OSM_colon_OSMR + SOCS3 ->
                SOCS3_colon_gp130_P_colon_OSM_colon_OSMR,
                [k74 * gp130_P_colon_OSM_colon_OSMR * SOCS3 ] ;
"unbind_gPoo_socs_74", SOCS3_colon_gp130_P_colon_OSM_colon_OSMR ->
                gp130_P_colon_OSM_colon_OSMR + SOCS3,
                [km74 * SOCS3_colon_gp130_P_colon_OSM_colon_OSMR ] ;
"bind_gooP_socs_75", gp130_colon_OSM_colon_OSMR_P + SOCS3 ->
                gp130_colon_OSM_colon_OSMR_P_colon_SOCS3,
                [k75 * gp130_colon_OSM_colon_OSMR_P * SOCS3 ] ;
"unbind_gooP_socs_75", gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 ->
                gp130_colon_OSM_colon_OSMR_P + SOCS3,
                [km75 * gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 ] ;
"bind_gPooP_socs_76", gp130_P_colon_OSM_colon_OSMR_P + SOCS3 ->
                SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P,
                [k76 * gp130_P_colon_OSM_colon_OSMR_P * SOCS3 ] ;
"unbind_gPooP_socs_76", SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P ->
                gp130_P_colon_OSM_colon_OSMR_P + SOCS3,
                [km76 * SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P ] ;
"bind_gPooP_socs_77", gp130_P_colon_OSM_colon_OSMR_P + SOCS3 ->
                gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3,
                [k77 * gp130_P_colon_OSM_colon_OSMR_P * SOCS3 ] ;
"unbind_gPooP_socs_77", gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ->
                gp130_P_colon_OSM_colon_OSMR_P + SOCS3,
                [km77 * gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ] ;
"bind_sgPooP_socs_78", SOCS3 + SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P ->
                SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3,
                [k78 * SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P * SOCS3 ] ;
"unbind_sgPooP_socs_78", SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ->
                SOCS3 + SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P,
```

```
                [km78 * SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ] ;
"bind_gPooPs_socs_79", SOCS3 + gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ->
                SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3,
                [k79 * gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 * SOCS3 ] ;
"unbind_gPooPs_socs_79", SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ->
                SOCS3 + gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3,
                [km79 * SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ] ;
"bind_pias_stat_80", STAT3_PD_n + PIAS3 -> PIAS3_colon_STAT3_PD_n,
                [k80 * PIAS3 * STAT3_PD_n ] ;
"unbind_pias_stat_80", PIAS3_colon_STAT3_PD_n -> STAT3_PD_n + PIAS3,
                [km80 * PIAS3_colon_STAT3_PD_n ] ;
"degr_socs_81", SOCS3 -> , [k81 * SOCS3 ] ;
```

B PRISM generated file

```
// PRISM model compiled from Bio-PEPA input file "_gp130_STAT_exp_all" by
// Bio-PEPA Workbench Version 0.9.9 "Chad Smith" [25-August-2008]

ctmc

const double _k1 = 0.000000804583443684188;
const double _k2 = 0.00000804583443684188;
const double _k3 = 0.00000804583443684188;
const double _k4 = 0.000000804583443684188;
const double _k5 = 0.00000804583443684188;
const double _k6 = 0.00000804583443684188;
const double _k7 = 0.2;
const double _k8 = 0.2;
const double _k9 = 0.2;
const double _k10 = 0.2;
const double _k11 = 0.2;
const double _k12 = 0.2;
const double _k13 = 0.2;
const double _k14 = 0.2;
const double _k15 = 0.2;
const double _k16 = 0.2;
const double _k17 = 0.2;
const double _k18 = 0.2;
const double _k19 = 0.2;
const double _k20 = 0.2;
const double _k21 = 0.2;
const double _k22 = 0.2;
const double _k23 = 0.2;
const double _k24 = 0.2;
const double _k25 = 0.000381503441478962;
const double _km25 = 0.06;
const double _k26 = 0.000381503441478962;
const double _km26 = 0.06;
const double _k27 = 0.000381503441478962;
const double _km27 = 0.06;
const double _k28 = 0.000381503441478962;
const double _km28 = 0.06;
const double _k29 = 0.000381503441478962;
const double _km29 = 0.06;
const double _k30 = 0.000381503441478962;
const double _km30 = 0.06;
const double _k31 = 0.000381503441478962;
const double _km31 = 0.06;
const double _k32 = 0.000381503441478962;
const double _km32 = 0.06;
const double _k33 = 0.000381503441478962;
const double _km33 = 0.06;
const double _k34 = 0.000381503441478962;
```

```
const double _km34 = 0.06;
const double _k35 = 0.000381503441478962;
const double _km35 = 0.06;
const double _k36 = 0.000381503441478962;
const double _km36 = 0.06;
const double _k37 = 0.000381503441478962;
const double _km37 = 0.06;
const double _k38 = 0.000381503441478962;
const double _km38 = 0.06;
const double _k39 = 0.000381503441478962;
const double _km39 = 0.06;
const double _k40 = 0.000381503441478962;
const double _km40 = 0.06;
const double _k41 = 0.000381503441478962;
const double _km41 = 0.06;
const double _k42 = 0.000381503441478962;
const double _km42 = 0.06;
const double _k43 = 0.2;
const double _k44 = 0.2;
const double _k45 = 0.2;
const double _k46 = 0.2;
const double _k47 = 0.2;
const double _k48 = 0.2;
const double _k49 = 0.2;
const double _k50 = 0.2;
const double _k51 = 0.2;
const double _k52 = 0.2;
const double _k53 = 0.2;
const double _k54 = 0.2;
const double _k55 = 1E+308;
const double _k56 = 1E+308;
const double _k57 = 1E+308;
const double _k58 = 1;
const double _k59 = 0.02;
const double _k60 = 15;
const double _k61 = 0.05;
const double _k62 = 0.0000476879301848702;
const double _km62 = 0.006;
const double _k63 = 0.0000476879301848702;
const double _km63 = 0.006;
const double _k64 = 0.0000476879301848702;
const double _km64 = 0.006;
const double _k65 = 0.0000476879301848702;
const double _km65 = 0.006;
const double _k66 = 0.0000476879301848702;
const double _km66 = 0.006;
const double _k67 = 0.0000476879301848702;
const double _km67 = 0.006;
const double _k68 = 0.0000476879301848702;
const double _km68 = 0.006;
```

```
const double _k69 = 0.0000476879301848702;
const double _km69 = 0.006;
const double _k70 = 0.0000476879301848702;
const double _km70 = 0.006;
const double _k71 = 0.0000476879301848702;
const double _km71 = 0.006;
const double _k72 = 0.0000476879301848702;
const double _km72 = 0.006;
const double _k73 = 0.0000476879301848702;
const double _km73 = 0.006;
const double _k74 = 0.0000476879301848702;
const double _km74 = 0.006;
const double _k75 = 0.0000476879301848702;
const double _km75 = 0.006;
const double _k76 = 0.0000476879301848702;
const double _km76 = 0.006;
const double _k77 = 0.0000476879301848702;
const double _km77 = 0.006;
const double _k78 = 0.0000476879301848702;
const double _km78 = 0.006;
const double _k79 = 0.0000476879301848702;
const double _km79 = 0.006;
const double _k80 = 0.000664451827242525;
const double _km80 = 0.4;
const double _k81 = 0.01;
const double _exosol = 0.00000000000991;
const double _cellMembrane = 0.000000126;
const double _cytosol = 0.00000000000209;
const double _nucleus = 0.00000000000025;
const double _na = 6.02E+023;

module Rates

  [_bind_gl_l_1] ((_k1 * _gp130 * _LIF * _LIFR  ) > 0) -> (_k1 * _gp130 * _LIF * _LIFR  ) : true;
  [_bind_ll_g_2] ((_k2 * _LIFR  * _LIF * _gp130 ) > 0) -> (_k2 * _LIFR  * _LIF * _gp130 ) : true;
  [_bind_go_l_3] ((_k3 * _gp130 * _OSM * _LIFR  ) > 0) -> (_k3 * _gp130 * _OSM * _LIFR  ) : true;
  [_bind_lo_g_4] ((_k4 * _LIFR  * _OSM * _gp130 ) > 0) -> (_k4 * _LIFR  * _OSM * _gp130 ) : true;
  [_bind_oo_g_5] ((_k5 * _OSMR  * _OSM * _gp130 ) > 0) -> (_k5 * _OSMR  * _OSM * _gp130 ) : true;
  [_bind_go_o_6] ((_k6 * _gp130 * _OSM * _OSMR  ) > 0) -> (_k6 * _gp130 * _OSM * _OSMR  ) : true;
  [_phospho_gll_7] ((_k7  * _gp130_colon_LIF_colon_LIFR   ) > 0) ->
                   (_k7  * _gp130_colon_LIF_colon_LIFR   ) : true;
  [_phospho_gll_8] ((_k8  * _gp130_colon_LIF_colon_LIFR   ) > 0) ->
                   (_k8  * _gp130_colon_LIF_colon_LIFR   ) : true;
  [_phospho_gll_9] ((_k9  * _gp130_P_colon_LIF_colon_LIFR ) > 0) ->
                   (_k9  * _gp130_P_colon_LIF_colon_LIFR ) : true;
  [_phospho_gll_10] ((_k10 * _gp130_colon_LIF_colon_LIFR_P ) > 0) ->
                   (_k10 * _gp130_colon_LIF_colon_LIFR_P ) : true;
  [_phospho_gol_11] ((_k11 * _gp130_colon_OSM_colon_LIFR   ) > 0) ->
                   (_k11 * _gp130_colon_OSM_colon_LIFR   ) : true;
  [_phospho_gol_12] ((_k12 * _gp130_colon_OSM_colon_LIFR   ) > 0) ->
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                  (_k12 * _gp130_colon_OSM_colon_LIFR   ) : true;
[_phospho_gol_13] ((_k13 * _gp130_P_colon_OSM_colon_LIFR ) > 0) ->
                  (_k13 * _gp130_P_colon_OSM_colon_LIFR ) : true;
[_phospho_gol_14] ((_k14 * _gp130_colon_OSM_colon_LIFR_P ) > 0) ->
                  (_k14 * _gp130_colon_OSM_colon_LIFR_P ) : true;
[_phospho_goo_15] ((_k15 * _gp130_colon_OSM_colon_OSMR   ) > 0) ->
                  (_k15 * _gp130_colon_OSM_colon_OSMR   ) : true;
[_phospho_goo_16] ((_k16 * _gp130_colon_OSM_colon_OSMR   ) > 0) ->
                  (_k16 * _gp130_colon_OSM_colon_OSMR   ) : true;
[_phospho_goo_17] ((_k17 * _gp130_P_colon_OSM_colon_OSMR ) > 0) ->
                  (_k17 * _gp130_P_colon_OSM_colon_OSMR ) : true;
[_phospho_goo_18] ((_k18 * _gp130_colon_OSM_colon_OSMR_P ) > 0) ->
                  (_k18 * _gp130_colon_OSM_colon_OSMR_P ) : true;
[_phospho_sgll_19] ((_k19 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR ) > 0) ->
                  (_k19 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR ) : true;
[_phospho_glls_20] ((_k20 * _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 ) > 0) ->
                  (_k20 * _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 ) : true;
[_phospho_sgol_21] ((_k21 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR ) > 0) ->
                  (_k21 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR ) : true;
[_phospho_gols_22] ((_k22 * _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 ) > 0) ->
                  (_k22 * _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 ) : true;
[_phospho_sgoo_23] ((_k23 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR ) > 0) ->
                  (_k23 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR ) : true;
[_phospho_goos_24] ((_k24 * _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 ) > 0) ->
                  (_k24 * _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 ) : true;
[_bind_gPll_stat_25] ((_k25  * _gp130_P_colon_LIF_colon_LIFR * _STAT3_c ) > 0) ->
                  (_k25  * _gp130_P_colon_LIF_colon_LIFR * _STAT3_c ) : true;
[_unbind_gPll_stat_25] ((_km25 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR ) > 0) ->
                  (_km25 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR ) : true;
[_bind_gllP_stat_26] ((_k26  * _gp130_colon_LIF_colon_LIFR_P * _STAT3_c ) > 0) ->
                  (_k26  * _gp130_colon_LIF_colon_LIFR_P * _STAT3_c ) : true;
[_unbind_gllP_stat_26] ((_km26 * _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 ) > 0) ->
                  (_km26 * _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 ) : true;
[_bind_gPllP_stat_27] ((_k27  * _gp130_P_colon_LIF_colon_LIFR_P * _STAT3_c ) > 0) ->
                  (_k27  * _gp130_P_colon_LIF_colon_LIFR_P * _STAT3_c ) : true;
[_unbind_gPllP_stat_27] ((_km27 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P ) > 0) ->
                  (_km27 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P ) : true;
[_bind_gPllP_stat_28] ((_k28  * _gp130_P_colon_LIF_colon_LIFR_P * _STAT3_c ) > 0) ->
                  (_k28  * _gp130_P_colon_LIF_colon_LIFR_P * _STAT3_c ) : true;
[_unbind_gPllP_stat_28] ((_km28 * _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) > 0) ->
                  (_km28 * _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) : true;
[_bind_sgPllP_stat_29] ((_k29  * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P * _STAT3_c ) > 0) ->
                  (_k29  * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P * _STAT3_c ) : true;
[_unbind_sgPllP_stat_29] ((_km29 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) > 0)
              -> (_km29 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) : true;
[_bind_gPllPs_stat_30] ((_k30  * _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 * _STAT3_c ) > 0) ->
                  (_k30  * _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 * _STAT3_c ) : true;
[_unbind_gPllPs_stat_30] ((_km30 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) > 0)
              -> (_km30 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) : true;
[_bind_gPol_stat_31] ((_k31  * _gp130_P_colon_OSM_colon_LIFR * _STAT3_c ) > 0) ->
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                (_k31  * _gp130_P_colon_OSM_colon_LIFR * _STAT3_c ) : true;
[_unbind_gPol_stat_31] ((_km31 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR ) > 0) ->
                (_km31 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR ) : true;
[_bind_golP_stat_32] ((_k32  * _gp130_colon_OSM_colon_LIFR_P * _STAT3_c ) > 0) ->
                (_k32  * _gp130_colon_OSM_colon_LIFR_P * _STAT3_c ) : true;
[_unbind_golP_stat_32] ((_km32 * _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 ) > 0) ->
                (_km32 * _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 ) : true;
[_bind_gPolP_stat_33] ((_k33  * _gp130_P_colon_OSM_colon_LIFR_P * _STAT3_c ) > 0) ->
                (_k33  * _gp130_P_colon_OSM_colon_LIFR_P * _STAT3_c ) : true;
[_unbind_gPolP_stat_33] ((_km33 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P ) > 0) ->
                (_km33 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P ) : true;
[_bind_gPolP_stat_34] ((_k34  * _gp130_P_colon_OSM_colon_LIFR_P * _STAT3_c ) > 0) ->
                (_k34  * _gp130_P_colon_OSM_colon_LIFR_P * _STAT3_c ) : true;
[_unbind_gPolP_stat_34] ((_km34 * _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) > 0) ->
                (_km34 * _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) : true;
[_bind_sgPolP_stat_35] ((_k35  * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P * _STAT3_c ) > 0) ->
                (_k35  * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P * _STAT3_c ) : true;
[_unbind_sgPolP_stat_35] ((_km35 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) > 0)
             -> (_km35 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) : true;
[_bind_gPolPs_stat_36] ((_k36  * _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 * _STAT3_c ) > 0) ->
                (_k36  * _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 * _STAT3_c ) : true;
[_unbind_gPolPs_stat_36] ((_km36 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) > 0)
             -> (_km36 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) : true;
[_bind_gPoo_stat_37] ((_k37  * _gp130_P_colon_OSM_colon_OSMR * _STAT3_c ) > 0) ->
                (_k37  * _gp130_P_colon_OSM_colon_OSMR * _STAT3_c ) : true;
[_unbind_gPoo_stat_37] ((_km37 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR ) > 0) ->
                (_km37 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR ) : true;
[_bind_gooP_stat_38] ((_k38  * _gp130_colon_OSM_colon_OSMR_P * _STAT3_c ) > 0) ->
                (_k38  * _gp130_colon_OSM_colon_OSMR_P * _STAT3_c ) : true;
[_unbind_gooP_stat_38] ((_km38 * _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 ) > 0) ->
                (_km38 * _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 ) : true;
[_bind_gPooP_stat_39] ((_k39  * _gp130_P_colon_OSM_colon_OSMR_P * _STAT3_c ) > 0) ->
                (_k39  * _gp130_P_colon_OSM_colon_OSMR_P * _STAT3_c ) : true;
[_unbind_gPooP_stat_39] ((_km39 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P ) > 0) ->
                (_km39 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P ) : true;
[_bind_gPooP_stat_40] ((_k40  * _gp130_P_colon_OSM_colon_OSMR_P * _STAT3_c ) > 0) ->
                (_k40  * _gp130_P_colon_OSM_colon_OSMR_P * _STAT3_c ) : true;
[_unbind_gPooP_stat_40] ((_km40 * _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) > 0) ->
                (_km40 * _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) : true;
[_bind_sgPooP_stat_41] ((_k41  * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P * _STAT3_c ) > 0)
             -> (_k41  * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P * _STAT3_c ) : true;
[_unbind_sgPooP_stat_41] ((_km41 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) > 0)
             -> (_km41 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) : true;
[_bind_gPooPs_stat_42] ((_k42  * _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 * _STAT3_c ) > 0)
             -> (_k42  * _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 * _STAT3_c ) : true;
[_unbind_gPooPs_stat_42] ((_km42 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) > 0)
             -> (_km42 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) : true;
[_phospho_stat_sglls_43] ((_k43 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) > 0)
             -> (_k43 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) : true;
[_phospho_stat_sglls_44] ((_k44 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) > 0)
```

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              -> (_k44 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) : true;
[_phospho_stat_sPglls_45] ((_k45 * _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3) > 0)
              -> (_k45 * _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 ) : true;
[_phospho_stat_sgllsP_46] ((_k46 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P) > 0)
              -> (_k46 * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P ) : true;
[_phospho_stat_sgols_47] ((_k47 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) > 0)
              -> (_k47 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) : true;
[_phospho_stat_sgols_48] ((_k48 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) > 0)
              -> (_k48 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) : true;
[_phospho_stat_sPgols_49] ((_k49 * _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3) > 0)
              -> (_k49 * _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 ) : true;
[_phospho_stat_sgolsP_50] ((_k50 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P) > 0)
              -> (_k50 * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P ) : true;
[_phospho_stat_sgoos_51] ((_k51 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) > 0)
              -> (_k51 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) : true;
[_phospho_stat_sgoos_52] ((_k52 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) > 0)
              -> (_k52 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) : true;
[_phospho_stat_sPgoos_53] ((_k53 * _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3) > 0)
              -> (_k53 * _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 ) : true;
[_phospho_stat_sgoosP_54] ((_k54 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P) > 0)
              -> (_k54 * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P ) : true;
[_unbind_s_gll_55] ((_k55 * _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P ) > 0)
              -> (_k55 * _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P ) : true;
[_unbind_s_gol_56] ((_k56 * _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P ) > 0)
              -> (_k56 * _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P ) : true;
[_unbind_s_goo_57] ((_k57 * _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P ) > 0)
              -> (_k57 * _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P ) : true;
[_reloc_stat_cn_58] (((0.693/_k58) * _STAT3_PD_c ) > 0) -> ((0.693/_k58) * _STAT3_PD_c) : true;
[_dephospho_dedimer_stat_59] ((_k59  * _STAT3_PD_n ) > 0) -> (_k59  * _STAT3_PD_n ) : true;
[_reloc_stat_nc_60] (((0.693/_k60) * _STAT3_n ) > 0) -> ((0.693/_k60) * _STAT3_n ) : true;
[_synth_socs_61] ((_k61  * _STAT3_PD_n ) > 0) -> (_k61  * _STAT3_PD_n ) : true;
[_bind_gPll_socs_62] ((_k62  * _gp130_P_colon_LIF_colon_LIFR * _SOCS3 ) > 0) ->
                (_k62  * _gp130_P_colon_LIF_colon_LIFR              * _SOCS3 ) : true;
[_unbind_gPll_socs_62] ((_km62 * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR ) > 0) ->
                (_km62 * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR ) : true;
[_bind_gllP_socs_63] ((_k63  * _gp130_colon_LIF_colon_LIFR_P * _SOCS3 ) > 0) ->
                (_k63  * _gp130_colon_LIF_colon_LIFR_P * _SOCS3 ) : true;
[_unbind_gllP_socs_63] ((_km63 * _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 ) > 0) ->
                (_km63 * _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 ) : true;
[_bind_gPllP_socs_64] ((_k64  * _gp130_P_colon_LIF_colon_LIFR_P * _SOCS3 ) > 0) ->
                (_k64  * _gp130_P_colon_LIF_colon_LIFR_P * _SOCS3 ) : true;
[_unbind_gPllP_socs_64] ((_km64 * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P ) > 0) ->
                (_km64 * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P ) : true;
[_bind_gPllP_socs_65] ((_k65  * _gp130_P_colon_LIF_colon_LIFR_P * _SOCS3 ) > 0) ->
                (_k65  * _gp130_P_colon_LIF_colon_LIFR_P * _SOCS3 ) : true;
[_unbind_gPllP_socs_65] ((_km65 * _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ) > 0) ->
                (_km65 * _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ) : true;
[_bind_sgPllP_socs_66] ((_k66  * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P * _SOCS3 ) > 0) ->
                (_k66  * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P * _SOCS3 ) : true;
[_unbind_sgPllP_socs_66] ((_km66 * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ) > 0)
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              -> (_km66 * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ) : true;
[_bind_gPllPs_socs_67] ((_k67  * _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 * _SOCS3 ) > 0) ->
                (_k67  * _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 * _SOCS3 ) : true;
[_unbind_gPllPs_socs_67] ((_km67 * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ) > 0)
              -> (_km67 * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 ) : true;
[_bind_gPol_socs_68] ((_k68  * _gp130_P_colon_OSM_colon_LIFR * _SOCS3 ) > 0) ->
                (_k68  * _gp130_P_colon_OSM_colon_LIFR * _SOCS3 ) : true;
[_unbind_gPol_socs_68] ((_km68 * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR ) > 0) ->
                (_km68 * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR ) : true;
[_bind_golP_socs_69] ((_k69  * _gp130_colon_OSM_colon_LIFR_P * _SOCS3 ) > 0) ->
                (_k69  * _gp130_colon_OSM_colon_LIFR_P * _SOCS3 ) : true;
[_unbind_golP_socs_69] ((_km69 * _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 ) > 0) ->
                (_km69 * _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 ) : true;
[_bind_gPolP_socs_70] ((_k70  * _gp130_P_colon_OSM_colon_LIFR_P * _SOCS3 ) > 0) ->
                (_k70  * _gp130_P_colon_OSM_colon_LIFR_P * _SOCS3 ) : true;
[_unbind_gPolP_socs_70] ((_km70 * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P ) > 0) ->
                (_km70 * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P ) : true;
[_bind_gPolP_socs_71] ((_k71  * _gp130_P_colon_OSM_colon_LIFR_P * _SOCS3 ) > 0) ->
                (_k71  * _gp130_P_colon_OSM_colon_LIFR_P * _SOCS3 ) : true;
[_unbind_gPolP_socs_71] ((_km71 * _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ) > 0) ->
                (_km71 * _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ) : true;
[_bind_sgPolP_socs_72] ((_k72  * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P * _SOCS3 ) > 0) ->
                (_k72  * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P * _SOCS3 ) : true;
[_unbind_sgPolP_socs_72] ((_km72 * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ) > 0)
              -> (_km72 * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ) : true;
[_bind_gPolPs_socs_73] ((_k73  * _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 * _SOCS3 ) > 0) ->
                (_k73  * _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 * _SOCS3 ) : true;
[_unbind_gPolPs_socs_73] ((_km73 * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ) > 0)
              -> (_km73 * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 ) : true;
[_bind_gPoo_socs_74] ((_k74  * _gp130_P_colon_OSM_colon_OSMR * _SOCS3 ) > 0) ->
                (_k74  * _gp130_P_colon_OSM_colon_OSMR * _SOCS3 ) : true;
[_unbind_gPoo_socs_74] ((_km74 * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR ) > 0) ->
                (_km74 * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR ) : true;
[_bind_gooP_socs_75] ((_k75  * _gp130_colon_OSM_colon_OSMR_P * _SOCS3 ) > 0) ->
                (_k75  * _gp130_colon_OSM_colon_OSMR_P * _SOCS3 ) : true;
[_unbind_gooP_socs_75] ((_km75 * _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 ) > 0) ->
                (_km75 * _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 ) : true;
[_bind_gPooP_socs_76] ((_k76  * _gp130_P_colon_OSM_colon_OSMR_P * _SOCS3 ) > 0) ->
                (_k76  * _gp130_P_colon_OSM_colon_OSMR_P * _SOCS3 ) : true;
[_unbind_gPooP_socs_76] ((_km76 * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P ) > 0) ->
                (_km76 * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P ) : true;
[_bind_gPooP_socs_77] ((_k77  * _gp130_P_colon_OSM_colon_OSMR_P * _SOCS3 ) > 0) ->
                (_k77  * _gp130_P_colon_OSM_colon_OSMR_P * _SOCS3 ) : true;
[_unbind_gPooP_socs_77] ((_km77 * _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ) > 0) ->
                (_km77 * _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ) : true;
[_bind_sgPooP_socs_78] ((_k78  * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P * _SOCS3 ) > 0) ->
                (_k78  * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P * _SOCS3 ) : true;
[_unbind_sgPooP_socs_78] ((_km78 * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ) > 0)
              -> (_km78 * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ) : true;
[_bind_gPooPs_socs_79] ((_k79  * _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 * _SOCS3 ) > 0) ->
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                    (_k79  * _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 * _SOCS3 ) : true;
  [_unbind_gPooPs_socs_79] ((_km79 * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ) > 0)
                -> (_km79 * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 ) : true;
  [_bind_pias_stat_80] ((_k80  * _PIAS3 * _STAT3_PD_n ) > 0) ->
                    (_k80  * _PIAS3 * _STAT3_PD_n ) : true;
  [_unbind_pias_stat_80] ((_km80 * _PIAS3_colon_STAT3_PD_n ) > 0) ->
                    (_km80 * _PIAS3_colon_STAT3_PD_n ) : true;
  [_degr_socs_81] ((_k81 * _SOCS3 ) > 0) -> (_k81 * _SOCS3 ) : true;

endmodule

const int MAX = 3000 + 1000 + 1000 + 3000 + 1000 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 +
                0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 +
                0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 3000 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 +
                0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 1000 + 0 + 1;

module _LIF

  _LIF : [0..MAX] init 3000;

  [_bind_gl_l_1] (_LIF >= 1) -> 1 : (_LIF' = _LIF - 1);
  [_bind_ll_g_2] (_LIF >= 1) -> 1 : (_LIF' = _LIF - 1);

endmodule

module _gp130

  _gp130 : [0..MAX] init 1000;

  [_bind_gl_l_1] (_gp130 >= 1) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_go_l_3] (_gp130 >= 1) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_go_o_6] (_gp130 >= 1) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_ll_g_2] (_gp130 >= 1) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_lo_g_4] (_gp130 >= 1) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_oo_g_5] (_gp130 >= 1) -> 1 : (_gp130' = _gp130 - 1);

endmodule

module _LIFR

  _LIFR : [0..MAX] init 1000;

  [_bind_ll_g_2] (_LIFR >= 1) -> 1 : (_LIFR' = _LIFR - 1);
  [_bind_lo_g_4] (_LIFR >= 1) -> 1 : (_LIFR' = _LIFR - 1);
  [_bind_gl_l_1] (_LIFR >= 1) -> 1 : (_LIFR' = _LIFR - 1);
  [_bind_go_l_3] (_LIFR >= 1) -> 1 : (_LIFR' = _LIFR - 1);

endmodule

module _OSM
```

```
  _OSM : [0..MAX] init 3000;

  [_bind_go_l_3] (_OSM >= 1) -> 1 : (_OSM' = _OSM - 1);
  [_bind_lo_g_4] (_OSM >= 1) -> 1 : (_OSM' = _OSM - 1);
  [_bind_oo_g_5] (_OSM >= 1) -> 1 : (_OSM' = _OSM - 1);
  [_bind_go_o_6] (_OSM >= 1) -> 1 : (_OSM' = _OSM - 1);

endmodule

module _OSMR

  _OSMR : [0..MAX] init 1000;

  [_bind_oo_g_5] (_OSMR >= 1) -> 1 : (_OSMR' = _OSMR - 1);
  [_bind_go_o_6] (_OSMR >= 1) -> 1 : (_OSMR' = _OSMR - 1);

endmodule

module _gp130_colon_LIF_colon_LIFR

  _gp130_colon_LIF_colon_LIFR : [0..MAX] init 0;

  [_bind_gl_l_1] (_gp130_colon_LIF_colon_LIFR + 1 <= MAX) ->
                 1 : (_gp130_colon_LIF_colon_LIFR' = _gp130_colon_LIF_colon_LIFR + 1);
  [_bind_ll_g_2] (_gp130_colon_LIF_colon_LIFR + 1 <= MAX) ->
                 1 : (_gp130_colon_LIF_colon_LIFR' = _gp130_colon_LIF_colon_LIFR + 1);
  [_phospho_gll_7] (_gp130_colon_LIF_colon_LIFR >= 1) ->
                 1 : (_gp130_colon_LIF_colon_LIFR' = _gp130_colon_LIF_colon_LIFR - 1);
  [_phospho_gll_8] (_gp130_colon_LIF_colon_LIFR >= 1) ->
                 1 : (_gp130_colon_LIF_colon_LIFR' = _gp130_colon_LIF_colon_LIFR - 1);

endmodule

module _gp130_colon_OSM_colon_LIFR

  _gp130_colon_OSM_colon_LIFR : [0..MAX] init 0;

  [_bind_go_l_3] (_gp130_colon_OSM_colon_LIFR + 1 <= MAX) ->
                 1 : (_gp130_colon_OSM_colon_LIFR' = _gp130_colon_OSM_colon_LIFR + 1);
  [_bind_lo_g_4] (_gp130_colon_OSM_colon_LIFR + 1 <= MAX) ->
                 1 : (_gp130_colon_OSM_colon_LIFR' = _gp130_colon_OSM_colon_LIFR + 1);
  [_phospho_gol_11] (_gp130_colon_OSM_colon_LIFR >= 1) ->
                 1 : (_gp130_colon_OSM_colon_LIFR' = _gp130_colon_OSM_colon_LIFR - 1);
  [_phospho_gol_12] (_gp130_colon_OSM_colon_LIFR >= 1) ->
                 1 : (_gp130_colon_OSM_colon_LIFR' = _gp130_colon_OSM_colon_LIFR - 1);

endmodule

module _gp130_colon_OSM_colon_OSMR
```

```
  _gp130_colon_OSM_colon_OSMR : [0..MAX] init 0;

  [_bind_oo_g_5] (_gp130_colon_OSM_colon_OSMR + 1 <= MAX) ->
                1 : (_gp130_colon_OSM_colon_OSMR' = _gp130_colon_OSM_colon_OSMR + 1);
  [_bind_go_o_6] (_gp130_colon_OSM_colon_OSMR + 1 <= MAX) ->
                1 : (_gp130_colon_OSM_colon_OSMR' = _gp130_colon_OSM_colon_OSMR + 1);
  [_phospho_goo_15] (_gp130_colon_OSM_colon_OSMR >= 1) ->
                1 : (_gp130_colon_OSM_colon_OSMR' = _gp130_colon_OSM_colon_OSMR - 1);
  [_phospho_goo_16] (_gp130_colon_OSM_colon_OSMR >= 1) ->
                1 : (_gp130_colon_OSM_colon_OSMR' = _gp130_colon_OSM_colon_OSMR - 1);

endmodule

module _gp130_P_colon_LIF_colon_LIFR

  _gp130_P_colon_LIF_colon_LIFR : [0..MAX] init 0;

  [_phospho_gll_7] (_gp130_P_colon_LIF_colon_LIFR + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR' = _gp130_P_colon_LIF_colon_LIFR + 1);
  [_phospho_gll_9] (_gp130_P_colon_LIF_colon_LIFR >= 1) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR' = _gp130_P_colon_LIF_colon_LIFR - 1);
  [_bind_gPll_stat_25] (_gp130_P_colon_LIF_colon_LIFR >= 1) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR' = _gp130_P_colon_LIF_colon_LIFR - 1);
  [_unbind_gPll_stat_25] (_gp130_P_colon_LIF_colon_LIFR + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR' = _gp130_P_colon_LIF_colon_LIFR + 1);
  [_bind_gPll_socs_62] (_gp130_P_colon_LIF_colon_LIFR >= 1) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR' = _gp130_P_colon_LIF_colon_LIFR - 1);
  [_unbind_gPll_socs_62] (_gp130_P_colon_LIF_colon_LIFR + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR' = _gp130_P_colon_LIF_colon_LIFR + 1);

endmodule

module _gp130_colon_LIF_colon_LIFR_P

  _gp130_colon_LIF_colon_LIFR_P : [0..MAX] init 0;

  [_phospho_gll_8] (_gp130_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_colon_LIF_colon_LIFR_P' = _gp130_colon_LIF_colon_LIFR_P + 1);
  [_phospho_gll_10] (_gp130_colon_LIF_colon_LIFR_P >= 1) ->
                1 : (_gp130_colon_LIF_colon_LIFR_P' = _gp130_colon_LIF_colon_LIFR_P - 1);
  [_bind_gllP_stat_26] (_gp130_colon_LIF_colon_LIFR_P >= 1) ->
                1 : (_gp130_colon_LIF_colon_LIFR_P' = _gp130_colon_LIF_colon_LIFR_P - 1);
  [_unbind_gllP_stat_26] (_gp130_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_colon_LIF_colon_LIFR_P' = _gp130_colon_LIF_colon_LIFR_P + 1);
  [_bind_gllP_socs_63] (_gp130_colon_LIF_colon_LIFR_P >= 1) ->
                1 : (_gp130_colon_LIF_colon_LIFR_P' = _gp130_colon_LIF_colon_LIFR_P - 1);
  [_unbind_gllP_socs_63] (_gp130_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_colon_LIF_colon_LIFR_P' = _gp130_colon_LIF_colon_LIFR_P + 1);
```

```
endmodule

module _gp130_P_colon_LIF_colon_LIFR_P

  _gp130_P_colon_LIF_colon_LIFR_P : [0..MAX] init 0;

  [_phospho_gll_9] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_phospho_gll_10] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_bind_gPllP_stat_27] (_gp130_P_colon_LIF_colon_LIFR_P >= 1) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P - 1);
  [_unbind_gPllP_stat_27] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_bind_gPllP_stat_28] (_gp130_P_colon_LIF_colon_LIFR_P >= 1) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P - 1);
  [_unbind_gPllP_stat_28] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_unbind_s_gll_55] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_bind_gPllP_socs_64] (_gp130_P_colon_LIF_colon_LIFR_P >= 1) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P - 1);
  [_unbind_gPllP_socs_64] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_bind_gPllP_socs_65] (_gp130_P_colon_LIF_colon_LIFR_P >= 1) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P - 1);
  [_unbind_gPllP_socs_65] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_LIFR

  _gp130_P_colon_OSM_colon_LIFR : [0..MAX] init 0;

  [_phospho_gol_11] (_gp130_P_colon_OSM_colon_LIFR + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR' = _gp130_P_colon_OSM_colon_LIFR + 1);
  [_phospho_gol_13] (_gp130_P_colon_OSM_colon_LIFR >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR' = _gp130_P_colon_OSM_colon_LIFR - 1);
  [_bind_gPol_stat_31] (_gp130_P_colon_OSM_colon_LIFR >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR' = _gp130_P_colon_OSM_colon_LIFR - 1);
  [_unbind_gPol_stat_31] (_gp130_P_colon_OSM_colon_LIFR + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR' = _gp130_P_colon_OSM_colon_LIFR + 1);
  [_bind_gPol_socs_68] (_gp130_P_colon_OSM_colon_LIFR >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR' = _gp130_P_colon_OSM_colon_LIFR - 1);
  [_unbind_gPol_socs_68] (_gp130_P_colon_OSM_colon_LIFR + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR' = _gp130_P_colon_OSM_colon_LIFR + 1);

endmodule
```

```
module _gp130_colon_OSM_colon_LIFR_P

  _gp130_colon_OSM_colon_LIFR_P : [0..MAX] init 0;

  [_phospho_gol_12] (_gp130_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_colon_OSM_colon_LIFR_P' = _gp130_colon_OSM_colon_LIFR_P + 1);
  [_phospho_gol_14] (_gp130_colon_OSM_colon_LIFR_P >= 1) ->
                1 : (_gp130_colon_OSM_colon_LIFR_P' = _gp130_colon_OSM_colon_LIFR_P - 1);
  [_bind_golP_stat_32] (_gp130_colon_OSM_colon_LIFR_P >= 1) ->
                1 : (_gp130_colon_OSM_colon_LIFR_P' = _gp130_colon_OSM_colon_LIFR_P - 1);
  [_unbind_golP_stat_32] (_gp130_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_colon_OSM_colon_LIFR_P' = _gp130_colon_OSM_colon_LIFR_P + 1);
  [_bind_golP_socs_69] (_gp130_colon_OSM_colon_LIFR_P >= 1) ->
                1 : (_gp130_colon_OSM_colon_LIFR_P' = _gp130_colon_OSM_colon_LIFR_P - 1);
  [_unbind_golP_socs_69] (_gp130_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_colon_OSM_colon_LIFR_P' = _gp130_colon_OSM_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_LIFR_P

  _gp130_P_colon_OSM_colon_LIFR_P : [0..MAX] init 0;

  [_phospho_gol_13] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_phospho_gol_14] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_bind_gPolP_stat_33] (_gp130_P_colon_OSM_colon_LIFR_P >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P - 1);
  [_unbind_gPolP_stat_33] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_bind_gPolP_stat_34] (_gp130_P_colon_OSM_colon_LIFR_P >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P - 1);
  [_unbind_gPolP_stat_34] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_unbind_s_gol_56] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_bind_gPolP_socs_70] (_gp130_P_colon_OSM_colon_LIFR_P >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P - 1);
  [_unbind_gPolP_socs_70] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_bind_gPolP_socs_71] (_gp130_P_colon_OSM_colon_LIFR_P >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P - 1);
  [_unbind_gPolP_socs_71] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_OSMR
```

```
  _gp130_P_colon_OSM_colon_OSMR : [0..MAX] init 0;

  [_phospho_goo_15] (_gp130_P_colon_OSM_colon_OSMR + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR' = _gp130_P_colon_OSM_colon_OSMR + 1);
  [_phospho_goo_17] (_gp130_P_colon_OSM_colon_OSMR >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR' = _gp130_P_colon_OSM_colon_OSMR - 1);
  [_bind_gPoo_stat_37] (_gp130_P_colon_OSM_colon_OSMR >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR' = _gp130_P_colon_OSM_colon_OSMR - 1);
  [_unbind_gPoo_stat_37] (_gp130_P_colon_OSM_colon_OSMR + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR' = _gp130_P_colon_OSM_colon_OSMR + 1);
  [_bind_gPoo_socs_74] (_gp130_P_colon_OSM_colon_OSMR >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR' = _gp130_P_colon_OSM_colon_OSMR - 1);
  [_unbind_gPoo_socs_74] (_gp130_P_colon_OSM_colon_OSMR + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR' = _gp130_P_colon_OSM_colon_OSMR + 1);

endmodule

module _gp130_colon_OSM_colon_OSMR_P

  _gp130_colon_OSM_colon_OSMR_P : [0..MAX] init 0;

  [_phospho_goo_16] (_gp130_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_colon_OSM_colon_OSMR_P' = _gp130_colon_OSM_colon_OSMR_P + 1);
  [_phospho_goo_18] (_gp130_colon_OSM_colon_OSMR_P >= 1) ->
                1 : (_gp130_colon_OSM_colon_OSMR_P' = _gp130_colon_OSM_colon_OSMR_P - 1);
  [_bind_gooP_stat_38] (_gp130_colon_OSM_colon_OSMR_P >= 1) ->
                1 : (_gp130_colon_OSM_colon_OSMR_P' = _gp130_colon_OSM_colon_OSMR_P - 1);
  [_unbind_gooP_stat_38] (_gp130_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_colon_OSM_colon_OSMR_P' = _gp130_colon_OSM_colon_OSMR_P + 1);
  [_bind_gooP_socs_75] (_gp130_colon_OSM_colon_OSMR_P >= 1) ->
                1 : (_gp130_colon_OSM_colon_OSMR_P' = _gp130_colon_OSM_colon_OSMR_P - 1);
  [_unbind_gooP_socs_75] (_gp130_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_colon_OSM_colon_OSMR_P' = _gp130_colon_OSM_colon_OSMR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_OSMR_P

  _gp130_P_colon_OSM_colon_OSMR_P : [0..MAX] init 0;

  [_phospho_goo_17] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_phospho_goo_18] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_bind_gPooP_stat_39] (_gp130_P_colon_OSM_colon_OSMR_P >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P - 1);
  [_unbind_gPooP_stat_39] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_bind_gPooP_stat_40] (_gp130_P_colon_OSM_colon_OSMR_P >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P - 1);
```

```
  [_unbind_gPooP_stat_40] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_unbind_s_goo_57] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_bind_gPooP_socs_76] (_gp130_P_colon_OSM_colon_OSMR_P >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P - 1);
  [_unbind_gPooP_socs_76] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_bind_gPooP_socs_77] (_gp130_P_colon_OSM_colon_OSMR_P >= 1) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P - 1);
  [_unbind_gPooP_socs_77] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);

endmodule

module _STAT3_colon_gp130_P_colon_LIF_colon_LIFR

  _STAT3_colon_gp130_P_colon_LIF_colon_LIFR : [0..MAX] init 0;

  [_bind_gPll_stat_25] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR + 1 <= MAX) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR' = _STAT3_colon_gp130_P_colon_LIF_colon_LIFR + 1);
  [_unbind_gPll_stat_25] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR' = _STAT3_colon_gp130_P_colon_LIF_colon_LIFR - 1);
  [_phospho_sgll_19] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR' = _STAT3_colon_gp130_P_colon_LIF_colon_LIFR - 1);

endmodule

module _gp130_colon_LIF_colon_LIFR_P_colon_STAT3

  _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_gllP_stat_26] (_gp130_colon_LIF_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
     (_gp130_colon_LIF_colon_LIFR_P_colon_STAT3' = _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 + 1);
  [_unbind_gllP_stat_26] (_gp130_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_gp130_colon_LIF_colon_LIFR_P_colon_STAT3' = _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);
  [_phospho_glls_20] (_gp130_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_gp130_colon_LIF_colon_LIFR_P_colon_STAT3' = _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);

endmodule

module _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P

  _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P : [0..MAX] init 0;

  [_bind_gPllP_stat_27] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_unbind_gPllP_stat_27] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P - 1);
  [_bind_sgPllP_stat_29] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P >= 1) -> 1 :
```

```
  (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P - 1);
  [_unbind_sgPllP_stat_29] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_phospho_sgll_19] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3

  _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_gPllP_stat_28] (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1);
  [_unbind_gPllP_stat_28] (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);
  [_bind_gPllPs_stat_30] (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);
  [_unbind_gPllPs_stat_30] (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1);
  [_phospho_glls_20] (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1);

endmodule

module _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3

  _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_sgPllP_stat_29] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1);
  [_unbind_sgPllP_stat_29] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);
  [_bind_gPllPs_stat_30] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1);
  [_unbind_gPllPs_stat_30] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);
  [_phospho_stat_sglls_43] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);
  [_phospho_stat_sglls_44] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);

endmodule
```

```
module _STAT3_colon_gp130_P_colon_OSM_colon_LIFR

  _STAT3_colon_gp130_P_colon_OSM_colon_LIFR : [0..MAX] init 0;

  [_bind_gPol_stat_31] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR' = _STAT3_colon_gp130_P_colon_OSM_colon_LIFR + 1);
  [_unbind_gPol_stat_31] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR' = _STAT3_colon_gp130_P_colon_OSM_colon_LIFR - 1);
  [_phospho_sgol_21] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR' = _STAT3_colon_gp130_P_colon_OSM_colon_LIFR - 1);

endmodule

module _gp130_colon_OSM_colon_LIFR_P_colon_STAT3

  _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_golP_stat_32] (_gp130_colon_OSM_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_colon_OSM_colon_LIFR_P_colon_STAT3' = _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 + 1);
  [_unbind_golP_stat_32] (_gp130_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_colon_OSM_colon_LIFR_P_colon_STAT3' = _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);
  [_phospho_gols_22] (_gp130_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_colon_OSM_colon_LIFR_P_colon_STAT3' = _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);

endmodule

module _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P

  _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P : [0..MAX] init 0;

  [_bind_gPolP_stat_33] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_unbind_gPolP_stat_33] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P - 1);
  [_bind_sgPolP_stat_35] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P - 1);
  [_unbind_sgPolP_stat_35] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_phospho_sgol_21] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3

  _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_gPolP_stat_34] (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1);
  [_unbind_gPolP_stat_34] (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
```

```
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);
  [_bind_gPolPs_stat_36] (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);
  [_unbind_gPolPs_stat_36] (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1);
  [_phospho_gols_22] (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1);

endmodule

module _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3

  _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_sgPolP_stat_35] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1);
  [_unbind_sgPolP_stat_35] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);
  [_bind_gPolPs_stat_36] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1 <= MAX) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1);
  [_unbind_gPolPs_stat_36] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);
  [_phospho_stat_sgols_47] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);
  [_phospho_stat_sgols_48] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);

endmodule

module _STAT3_colon_gp130_P_colon_OSM_colon_OSMR

  _STAT3_colon_gp130_P_colon_OSM_colon_OSMR : [0..MAX] init 0;

  [_bind_gPoo_stat_37] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR' = _STAT3_colon_gp130_P_colon_OSM_colon_OSMR + 1);
  [_unbind_gPoo_stat_37] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR' = _STAT3_colon_gp130_P_colon_OSM_colon_OSMR - 1);
  [_phospho_sgoo_23] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR' = _STAT3_colon_gp130_P_colon_OSM_colon_OSMR - 1);

endmodule

module _gp130_colon_OSM_colon_OSMR_P_colon_STAT3
```

```
  _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_gooP_stat_38] (_gp130_colon_OSM_colon_OSMR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_colon_OSM_colon_OSMR_P_colon_STAT3' = _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 + 1);
  [_unbind_gooP_stat_38] (_gp130_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_colon_OSM_colon_OSMR_P_colon_STAT3' = _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);
  [_phospho_goos_24] (_gp130_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_colon_OSM_colon_OSMR_P_colon_STAT3' = _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);

endmodule

module _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P

  _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P : [0..MAX] init 0;

  [_bind_gPooP_stat_39] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_unbind_gPooP_stat_39] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P - 1);
  [_bind_sgPooP_stat_41] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P >= 1) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P - 1);
  [_unbind_sgPooP_stat_41] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_phospho_sgoo_23] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) -> 1 :
  (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3

  _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_gPooP_stat_40] (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1);
  [_unbind_gPooP_stat_40] (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);
  [_bind_gPooPs_stat_42] (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1) -> 1 :
  (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);
  [_unbind_gPooPs_stat_42] (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1);
  [_phospho_goos_24] (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1);

endmodule

module _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3

  _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 : [0..MAX] init 0;

  [_bind_sgPooP_stat_41] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1 <= MAX) -> 1 :
```

```
     (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1);
  [_unbind_sgPooP_stat_41] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);
  [_bind_gPooPs_stat_42] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1 <= MAX) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1);
  [_unbind_gPooPs_stat_42] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);
  [_phospho_stat_sgoos_51] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);
  [_phospho_stat_sgoos_52] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1) -> 1 :
     (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' =
      _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);

endmodule

module _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3

  _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 : [0..MAX] init 0;

  [_phospho_stat_sglls_43] (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' =
            _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 + 1);
  [_phospho_stat_sPglls_45] (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 >= 1)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3' =
            _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 - 1);

endmodule

module _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P

  _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P : [0..MAX] init 0;

  [_phospho_stat_sglls_44] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P + 1 <= MAX)
     -> 1 : (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P + 1);
  [_phospho_stat_sgllsP_46] (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P >= 1)
     -> 1 : (_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P - 1);

endmodule

module _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P

  _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P : [0..MAX] init 0;
```

```
  [_phospho_stat_sPglls_45] (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P + 1);
  [_phospho_stat_sgllsP_46] (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P + 1);
  [_unbind_s_gll_55] (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P >= 1)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P - 1);

endmodule

module _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3

  _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 : [0..MAX] init 0;

  [_phospho_stat_sgols_47] (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' =
             _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 + 1);
  [_phospho_stat_sPgols_49] (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 >= 1)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3' =
             _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 - 1);

endmodule

module _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P

  _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P : [0..MAX] init 0;

  [_phospho_stat_sgols_48] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P + 1 <= MAX)
    -> 1 : (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P + 1);
  [_phospho_stat_sgolsP_50] (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P >= 1)
    -> 1 : (_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P - 1);

endmodule

module _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P

  _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P : [0..MAX] init 0;

  [_phospho_stat_sPgols_49] (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P + 1);
  [_phospho_stat_sgolsP_50] (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P' =
             _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P + 1);
  [_unbind_s_gol_56] (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P >= 1)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P' =
```

```
            _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P - 1);

endmodule

module _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3

  _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 : [0..MAX] init 0;

  [_phospho_stat_sgoos_51] (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' =
            _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 + 1);
  [_phospho_stat_sPgoos_53] (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 >= 1)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3' =
            _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 - 1);

endmodule

module _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P

  _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P : [0..MAX] init 0;

  [_phospho_stat_sgoos_52] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P + 1 <= MAX)
    -> 1 : (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P' =
            _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P + 1);
  [_phospho_stat_sgoosP_54] (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P >= 1)
    -> 1 : (_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P' =
            _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P - 1);

endmodule

module _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P

  _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P : [0..MAX] init 0;

  [_phospho_stat_sPgoos_53] (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P' =
            _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P + 1);
  [_phospho_stat_sgoosP_54] (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P + 1 <= MAX)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P' =
            _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P + 1);
  [_unbind_s_goo_57] (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P >= 1)
    -> 1 : (_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P' =
            _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P - 1);

endmodule

module _STAT3_c

  _STAT3_c : [0..MAX] init 3000;
```

```
  [_bind_gPll_stat_25] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPll_stat_25] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gllP_stat_26] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gllP_stat_26] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPllP_stat_27] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPllP_stat_27] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPllP_stat_28] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPllP_stat_28] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_sgPllP_stat_29] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_sgPllP_stat_29] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPllPs_stat_30] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPllPs_stat_30] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPol_stat_31] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPol_stat_31] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_golP_stat_32] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_golP_stat_32] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPolP_stat_33] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPolP_stat_33] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPolP_stat_34] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPolP_stat_34] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_sgPolP_stat_35] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_sgPolP_stat_35] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPolPs_stat_36] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPolPs_stat_36] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPoo_stat_37] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPoo_stat_37] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gooP_stat_38] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gooP_stat_38] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPooP_stat_39] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPooP_stat_39] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPooP_stat_40] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPooP_stat_40] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_sgPooP_stat_41] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_sgPooP_stat_41] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_gPooPs_stat_42] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_gPooPs_stat_42] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_reloc_stat_nc_60] (_STAT3_c + 1 <= MAX) -> 1 : (_STAT3_c' = _STAT3_c + 1);

endmodule

module _STAT3_PD_c

  _STAT3_PD_c : [0..MAX] init 0;

  [_unbind_s_gll_55] (_STAT3_PD_c + 1 <= MAX) -> 1 : (_STAT3_PD_c' = _STAT3_PD_c + 1);
  [_unbind_s_gol_56] (_STAT3_PD_c + 1 <= MAX) -> 1 : (_STAT3_PD_c' = _STAT3_PD_c + 1);
  [_unbind_s_goo_57] (_STAT3_PD_c + 1 <= MAX) -> 1 : (_STAT3_PD_c' = _STAT3_PD_c + 1);
  [_reloc_stat_cn_58] (_STAT3_PD_c >= 1) -> 1 : (_STAT3_PD_c' = _STAT3_PD_c - 1);

endmodule
```

```
module _STAT3_PD_n

  _STAT3_PD_n : [0..MAX] init 0;

  [_reloc_stat_cn_58] (_STAT3_PD_n + 1 <= MAX) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n + 1);
  [_synth_socs_61] (_STAT3_PD_n + 0 <= MAX) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n + 0);
  [_dephospho_dedimer_stat_59] (_STAT3_PD_n >= 1) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n - 1);
  [_bind_pias_stat_80] (_STAT3_PD_n >= 1) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n - 1);
  [_unbind_pias_stat_80] (_STAT3_PD_n + 1 <= MAX) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n + 1);

endmodule

module _STAT3_n

  _STAT3_n : [0..MAX] init 0;

  [_dephospho_dedimer_stat_59] (_STAT3_n + 2 <= MAX) -> 1 : (_STAT3_n' = _STAT3_n + 2);
  [_reloc_stat_nc_60] (_STAT3_n >= 1) -> 1 : (_STAT3_n' = _STAT3_n - 1);

endmodule

module _SOCS3

  _SOCS3 : [0..MAX] init 0;

  [_synth_socs_61] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_degr_socs_81] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_bind_gPll_socs_62] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPll_socs_62] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gllP_socs_63] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gllP_socs_63] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPllP_socs_64] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPllP_socs_64] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPllP_socs_65] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPllP_socs_65] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_sgPllP_socs_66] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_sgPllP_socs_66] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPllPs_socs_67] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPllPs_socs_67] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPol_socs_68] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPol_socs_68] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_golP_socs_69] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_golP_socs_69] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPolP_socs_70] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPolP_socs_70] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPolP_socs_71] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPolP_socs_71] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_sgPolP_socs_72] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_sgPolP_socs_72] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
```

```
  [_bind_gPolPs_socs_73] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPolPs_socs_73] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPoo_socs_74] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPoo_socs_74] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gooP_socs_75] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gooP_socs_75] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPooP_socs_76] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPooP_socs_76] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPooP_socs_77] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPooP_socs_77] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_sgPooP_socs_78] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_sgPooP_socs_78] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_gPooPs_socs_79] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_gPooPs_socs_79] (_SOCS3 + 1 <= MAX) -> 1 : (_SOCS3' = _SOCS3 + 1);

endmodule

module _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR

  _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR : [0..MAX] init 0;

  [_bind_gPll_socs_62] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR + 1 <= MAX) -> 1 :
  (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR' = _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR + 1);
  [_unbind_gPll_socs_62] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR >= 1) -> 1 :
  (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR' = _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR - 1);

endmodule

module _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3

  _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 : [0..MAX] init 0;

  [_bind_gllP_socs_63] (_gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
  (_gp130_colon_LIF_colon_LIFR_P_colon_SOCS3' = _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1);
  [_unbind_gllP_socs_63] (_gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 >= 1) -> 1 :
  (_gp130_colon_LIF_colon_LIFR_P_colon_SOCS3' = _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 - 1);

endmodule

module _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P

  _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P : [0..MAX] init 0;

  [_bind_gPllP_socs_64] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_unbind_gPllP_socs_64] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P >= 1) -> 1 :
  (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P - 1);
  [_bind_sgPllP_socs_66] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P >= 1) -> 1 :
  (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P - 1);
  [_unbind_sgPllP_socs_66] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1 <= MAX) -> 1 :
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  (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P' = _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3

  _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 : [0..MAX] init 0;

  [_bind_gPllP_socs_65] (_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1);
  [_unbind_gPllP_socs_65] (_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 >= 1) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 - 1);
  [_bind_gPllPs_socs_67] (_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 >= 1) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 - 1);
  [_unbind_gPllPs_socs_67] (_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3' = _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1);

endmodule

module _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3

  _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 : [0..MAX] init 0;

  [_bind_sgPllP_socs_66] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1 <= MAX)
    -> 1 : (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3' =
             _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1);
  [_unbind_sgPllP_socs_66] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 >= 1)
    -> 1 : (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3' =
             _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 - 1);
  [_bind_gPllPs_socs_67] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1 <= MAX)
    -> 1 : (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3' =
             _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 + 1);
  [_unbind_gPllPs_socs_67] (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 >= 1)
    -> 1 : (_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3' =
             _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 - 1);

endmodule

module _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR

  _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR : [0..MAX] init 0;

  [_bind_gPol_socs_68] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR + 1 <= MAX) -> 1 :
  (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR' = _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR + 1);
  [_unbind_gPol_socs_68] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR >= 1) -> 1 :
  (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR' = _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR - 1);

endmodule

module _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3
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  _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 : [0..MAX] init 0;

  [_bind_golP_socs_69] (_gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
  (_gp130_colon_OSM_colon_LIFR_P_colon_SOCS3' = _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1);
  [_unbind_golP_socs_69] (_gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 >= 1) -> 1 :
  (_gp130_colon_OSM_colon_LIFR_P_colon_SOCS3' = _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 - 1);

endmodule

module _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P

  _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P : [0..MAX] init 0;

  [_bind_gPolP_socs_70] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_unbind_gPolP_socs_70] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P >= 1) -> 1 :
  (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P - 1);
  [_bind_sgPolP_socs_72] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P >= 1) -> 1 :
  (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P - 1);
  [_unbind_sgPolP_socs_72] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1 <= MAX) -> 1 :
  (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P' = _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3

  _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 : [0..MAX] init 0;

  [_bind_gPolP_socs_71] (_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1);
  [_unbind_gPolP_socs_71] (_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 >= 1) -> 1 :
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 - 1);
  [_bind_gPolPs_socs_73] (_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 >= 1) -> 1 :
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 - 1);
  [_unbind_gPolPs_socs_73] (_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
  (_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3' = _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1);

endmodule

module _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3

  _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 : [0..MAX] init 0;

  [_bind_sgPolP_socs_72] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1 <= MAX)
    -> 1 : (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3' =
            _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1);
  [_unbind_sgPolP_socs_72] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 >= 1)
    -> 1 : (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3' =
            _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 - 1);
```

```
  [_bind_gPolPs_socs_73] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1 <= MAX)
    -> 1 : (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3' =
            _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 + 1);
  [_unbind_gPolPs_socs_73] (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 >= 1)
    -> 1 : (_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3' =
            _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 - 1);

endmodule

module _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR

  _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR : [0..MAX] init 0;

  [_bind_gPoo_socs_74] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR + 1 <= MAX) -> 1 :
  (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR' = _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR + 1);
  [_unbind_gPoo_socs_74] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR >= 1) -> 1 :
 (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR' = _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR - 1);

endmodule

module _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3

  _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 : [0..MAX] init 0;

  [_bind_gooP_socs_75] (_gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
 (_gp130_colon_OSM_colon_OSMR_P_colon_SOCS3' = _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1);
  [_unbind_gooP_socs_75] (_gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 >= 1) -> 1 :
 (_gp130_colon_OSM_colon_OSMR_P_colon_SOCS3' = _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 - 1);

endmodule

module _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P

  _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P : [0..MAX] init 0;

  [_bind_gPooP_socs_76] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) -> 1 :
 (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1);
  [_unbind_gPooP_socs_76] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P >= 1) -> 1 :
 (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P - 1);
  [_bind_sgPooP_socs_78] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P >= 1) -> 1 :
 (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P - 1);
  [_unbind_sgPooP_socs_78] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1 <= MAX) -> 1 :
 (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P' = _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3

  _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 : [0..MAX] init 0;
```

```
  [_bind_gPooP_socs_77] (_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
 (_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1);
  [_unbind_gPooP_socs_77] (_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 >= 1) -> 1 :
 (_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 - 1);
  [_bind_gPooPs_socs_79] (_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 >= 1) -> 1 :
 (_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 - 1);
  [_unbind_gPooPs_socs_79] (_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1 <= MAX) -> 1 :
 (_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3' = _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1);

endmodule

module _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3

  _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 : [0..MAX] init 0;

  [_bind_sgPooP_socs_78] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1 <= MAX)
    -> 1 : (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3' =
             _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1);
  [_unbind_sgPooP_socs_78] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 >= 1)
    -> 1 : (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3' =
             _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 - 1);
  [_bind_gPooPs_socs_79] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1 <= MAX)
    -> 1 : (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3' =
             _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 + 1);
  [_unbind_gPooPs_socs_79] (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 >= 1)
    -> 1 : (_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3' =
             _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 - 1);

endmodule

module _PIAS3

  _PIAS3 : [0..MAX] init 1000;

  [_bind_pias_stat_80] (_PIAS3 >= 1) -> 1 : (_PIAS3' = _PIAS3 - 1);
  [_unbind_pias_stat_80] (_PIAS3 + 1 <= MAX) -> 1 : (_PIAS3' = _PIAS3 + 1);

endmodule

module _PIAS3_colon_STAT3_PD_n

  _PIAS3_colon_STAT3_PD_n : [0..MAX] init 0;

  [_bind_pias_stat_80] (_PIAS3_colon_STAT3_PD_n + 1 <= MAX) ->
                       1 : (_PIAS3_colon_STAT3_PD_n' = _PIAS3_colon_STAT3_PD_n + 1);
  [_unbind_pias_stat_80] (_PIAS3_colon_STAT3_PD_n >= 1) ->
                       1 : (_PIAS3_colon_STAT3_PD_n' = _PIAS3_colon_STAT3_PD_n - 1);

endmodule
```

```
module _res

  _res : [0..MAX] init 1;

  [_degr_socs_81] (_res + 0 <= MAX) -> 1 : (_res' = _res + 0);

endmodule


// count rewards: "number of occurrences of bind_gl_l_1"
rewards "_bind_gl_l_1"
  [_bind_gl_l_1] true : 1;
endrewards

// count rewards: "number of occurrences of bind_ll_g_2"
rewards "_bind_ll_g_2"
  [_bind_ll_g_2] true : 1;
endrewards

// count rewards: "number of occurrences of bind_go_l_3"
rewards "_bind_go_l_3"
  [_bind_go_l_3] true : 1;
endrewards

// count rewards: "number of occurrences of bind_lo_g_4"
rewards "_bind_lo_g_4"
  [_bind_lo_g_4] true : 1;
endrewards

// count rewards: "number of occurrences of bind_oo_g_5"
rewards "_bind_oo_g_5"
  [_bind_oo_g_5] true : 1;
endrewards

// count rewards: "number of occurrences of bind_go_o_6"
rewards "_bind_go_o_6"
  [_bind_go_o_6] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gll_7"
rewards "_phospho_gll_7"
  [_phospho_gll_7] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gll_8"
rewards "_phospho_gll_8"
  [_phospho_gll_8] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gll_9"
```

```
rewards "_phospho_gll_9"
  [_phospho_gll_9] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gll_10"
rewards "_phospho_gll_10"
  [_phospho_gll_10] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gol_11"
rewards "_phospho_gol_11"
  [_phospho_gol_11] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gol_12"
rewards "_phospho_gol_12"
  [_phospho_gol_12] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gol_13"
rewards "_phospho_gol_13"
  [_phospho_gol_13] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gol_14"
rewards "_phospho_gol_14"
  [_phospho_gol_14] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goo_15"
rewards "_phospho_goo_15"
  [_phospho_goo_15] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goo_16"
rewards "_phospho_goo_16"
  [_phospho_goo_16] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goo_17"
rewards "_phospho_goo_17"
  [_phospho_goo_17] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goo_18"
rewards "_phospho_goo_18"
  [_phospho_goo_18] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_sgll_19"
```

```
rewards "_phospho_sgll_19"
  [_phospho_sgll_19] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_glls_20"
rewards "_phospho_glls_20"
  [_phospho_glls_20] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_sgol_21"
rewards "_phospho_sgol_21"
  [_phospho_sgol_21] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gols_22"
rewards "_phospho_gols_22"
  [_phospho_gols_22] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_sgoo_23"
rewards "_phospho_sgoo_23"
  [_phospho_sgoo_23] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goos_24"
rewards "_phospho_goos_24"
  [_phospho_goos_24] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPll_stat_25"
rewards "_bind_gPll_stat_25"
  [_bind_gPll_stat_25] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPll_stat_25"
rewards "_unbind_gPll_stat_25"
  [_unbind_gPll_stat_25] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gllP_stat_26"
rewards "_bind_gllP_stat_26"
  [_bind_gllP_stat_26] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gllP_stat_26"
rewards "_unbind_gllP_stat_26"
  [_unbind_gllP_stat_26] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPllP_stat_27"
```

```
rewards "_bind_gPllP_stat_27"
  [_bind_gPllP_stat_27] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPllP_stat_27"
rewards "_unbind_gPllP_stat_27"
  [_unbind_gPllP_stat_27] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPllP_stat_28"
rewards "_bind_gPllP_stat_28"
  [_bind_gPllP_stat_28] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPllP_stat_28"
rewards "_unbind_gPllP_stat_28"
  [_unbind_gPllP_stat_28] true : 1;
endrewards

// count rewards: "number of occurrences of bind_sgPllP_stat_29"
rewards "_bind_sgPllP_stat_29"
  [_bind_sgPllP_stat_29] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_sgPllP_stat_29"
rewards "_unbind_sgPllP_stat_29"
  [_unbind_sgPllP_stat_29] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPllPs_stat_30"
rewards "_bind_gPllPs_stat_30"
  [_bind_gPllPs_stat_30] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPllPs_stat_30"
rewards "_unbind_gPllPs_stat_30"
  [_unbind_gPllPs_stat_30] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPol_stat_31"
rewards "_bind_gPol_stat_31"
  [_bind_gPol_stat_31] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPol_stat_31"
rewards "_unbind_gPol_stat_31"
  [_unbind_gPol_stat_31] true : 1;
endrewards

// count rewards: "number of occurrences of bind_golP_stat_32"
```

```
rewards "_bind_golP_stat_32"
  [_bind_golP_stat_32] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_golP_stat_32"
rewards "_unbind_golP_stat_32"
  [_unbind_golP_stat_32] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPolP_stat_33"
rewards "_bind_gPolP_stat_33"
  [_bind_gPolP_stat_33] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPolP_stat_33"
rewards "_unbind_gPolP_stat_33"
  [_unbind_gPolP_stat_33] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPolP_stat_34"
rewards "_bind_gPolP_stat_34"
  [_bind_gPolP_stat_34] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPolP_stat_34"
rewards "_unbind_gPolP_stat_34"
  [_unbind_gPolP_stat_34] true : 1;
endrewards

// count rewards: "number of occurrences of bind_sgPolP_stat_35"
rewards "_bind_sgPolP_stat_35"
  [_bind_sgPolP_stat_35] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_sgPolP_stat_35"
rewards "_unbind_sgPolP_stat_35"
  [_unbind_sgPolP_stat_35] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPolPs_stat_36"
rewards "_bind_gPolPs_stat_36"
  [_bind_gPolPs_stat_36] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPolPs_stat_36"
rewards "_unbind_gPolPs_stat_36"
  [_unbind_gPolPs_stat_36] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPoo_stat_37"
```

```
rewards "_bind_gPoo_stat_37"
  [_bind_gPoo_stat_37] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPoo_stat_37"
rewards "_unbind_gPoo_stat_37"
  [_unbind_gPoo_stat_37] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gooP_stat_38"
rewards "_bind_gooP_stat_38"
  [_bind_gooP_stat_38] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gooP_stat_38"
rewards "_unbind_gooP_stat_38"
  [_unbind_gooP_stat_38] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPooP_stat_39"
rewards "_bind_gPooP_stat_39"
  [_bind_gPooP_stat_39] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPooP_stat_39"
rewards "_unbind_gPooP_stat_39"
  [_unbind_gPooP_stat_39] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPooP_stat_40"
rewards "_bind_gPooP_stat_40"
  [_bind_gPooP_stat_40] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPooP_stat_40"
rewards "_unbind_gPooP_stat_40"
  [_unbind_gPooP_stat_40] true : 1;
endrewards

// count rewards: "number of occurrences of bind_sgPooP_stat_41"
rewards "_bind_sgPooP_stat_41"
  [_bind_sgPooP_stat_41] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_sgPooP_stat_41"
rewards "_unbind_sgPooP_stat_41"
  [_unbind_sgPooP_stat_41] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPooPs_stat_42"
```

```
rewards "_bind_gPooPs_stat_42"
  [_bind_gPooPs_stat_42] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPooPs_stat_42"
rewards "_unbind_gPooPs_stat_42"
  [_unbind_gPooPs_stat_42] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sglls_43"
rewards "_phospho_stat_sglls_43"
  [_phospho_stat_sglls_43] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sglls_44"
rewards "_phospho_stat_sglls_44"
  [_phospho_stat_sglls_44] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sPglls_45"
rewards "_phospho_stat_sPglls_45"
  [_phospho_stat_sPglls_45] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sgllsP_46"
rewards "_phospho_stat_sgllsP_46"
  [_phospho_stat_sgllsP_46] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sgols_47"
rewards "_phospho_stat_sgols_47"
  [_phospho_stat_sgols_47] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sgols_48"
rewards "_phospho_stat_sgols_48"
  [_phospho_stat_sgols_48] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sPgols_49"
rewards "_phospho_stat_sPgols_49"
  [_phospho_stat_sPgols_49] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sgolsP_50"
rewards "_phospho_stat_sgolsP_50"
  [_phospho_stat_sgolsP_50] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sgoos_51"
```

```
rewards "_phospho_stat_sgoos_51"
  [_phospho_stat_sgoos_51] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sgoos_52"
rewards "_phospho_stat_sgoos_52"
  [_phospho_stat_sgoos_52] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sPgoos_53"
rewards "_phospho_stat_sPgoos_53"
  [_phospho_stat_sPgoos_53] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_sgoosP_54"
rewards "_phospho_stat_sgoosP_54"
  [_phospho_stat_sgoosP_54] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_s_gll_55"
rewards "_unbind_s_gll_55"
  [_unbind_s_gll_55] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_s_gol_56"
rewards "_unbind_s_gol_56"
  [_unbind_s_gol_56] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_s_goo_57"
rewards "_unbind_s_goo_57"
  [_unbind_s_goo_57] true : 1;
endrewards

// count rewards: "number of occurrences of reloc_stat_cn_58"
rewards "_reloc_stat_cn_58"
  [_reloc_stat_cn_58] true : 1;
endrewards

// count rewards: "number of occurrences of dephospho_dedimer_stat_59"
rewards "_dephospho_dedimer_stat_59"
  [_dephospho_dedimer_stat_59] true : 1;
endrewards

// count rewards: "number of occurrences of reloc_stat_nc_60"
rewards "_reloc_stat_nc_60"
  [_reloc_stat_nc_60] true : 1;
endrewards

// count rewards: "number of occurrences of synth_socs_61"
```

```
rewards "_synth_socs_61"
  [_synth_socs_61] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPll_socs_62"
rewards "_bind_gPll_socs_62"
  [_bind_gPll_socs_62] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPll_socs_62"
rewards "_unbind_gPll_socs_62"
  [_unbind_gPll_socs_62] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gllP_socs_63"
rewards "_bind_gllP_socs_63"
  [_bind_gllP_socs_63] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gllP_socs_63"
rewards "_unbind_gllP_socs_63"
  [_unbind_gllP_socs_63] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPllP_socs_64"
rewards "_bind_gPllP_socs_64"
  [_bind_gPllP_socs_64] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPllP_socs_64"
rewards "_unbind_gPllP_socs_64"
  [_unbind_gPllP_socs_64] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPllP_socs_65"
rewards "_bind_gPllP_socs_65"
  [_bind_gPllP_socs_65] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPllP_socs_65"
rewards "_unbind_gPllP_socs_65"
  [_unbind_gPllP_socs_65] true : 1;
endrewards

// count rewards: "number of occurrences of bind_sgPllP_socs_66"
rewards "_bind_sgPllP_socs_66"
  [_bind_sgPllP_socs_66] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_sgPllP_socs_66"
```

```
rewards "_unbind_sgPllP_socs_66"
  [_unbind_sgPllP_socs_66] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPllPs_socs_67"
rewards "_bind_gPllPs_socs_67"
  [_bind_gPllPs_socs_67] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPllPs_socs_67"
rewards "_unbind_gPllPs_socs_67"
  [_unbind_gPllPs_socs_67] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPol_socs_68"
rewards "_bind_gPol_socs_68"
  [_bind_gPol_socs_68] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPol_socs_68"
rewards "_unbind_gPol_socs_68"
  [_unbind_gPol_socs_68] true : 1;
endrewards

// count rewards: "number of occurrences of bind_golP_socs_69"
rewards "_bind_golP_socs_69"
  [_bind_golP_socs_69] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_golP_socs_69"
rewards "_unbind_golP_socs_69"
  [_unbind_golP_socs_69] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPolP_socs_70"
rewards "_bind_gPolP_socs_70"
  [_bind_gPolP_socs_70] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPolP_socs_70"
rewards "_unbind_gPolP_socs_70"
  [_unbind_gPolP_socs_70] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPolP_socs_71"
rewards "_bind_gPolP_socs_71"
  [_bind_gPolP_socs_71] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPolP_socs_71"
```

```
rewards "_unbind_gPolP_socs_71"
  [_unbind_gPolP_socs_71] true : 1;
endrewards

// count rewards: "number of occurrences of bind_sgPolP_socs_72"
rewards "_bind_sgPolP_socs_72"
  [_bind_sgPolP_socs_72] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_sgPolP_socs_72"
rewards "_unbind_sgPolP_socs_72"
  [_unbind_sgPolP_socs_72] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPolPs_socs_73"
rewards "_bind_gPolPs_socs_73"
  [_bind_gPolPs_socs_73] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPolPs_socs_73"
rewards "_unbind_gPolPs_socs_73"
  [_unbind_gPolPs_socs_73] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPoo_socs_74"
rewards "_bind_gPoo_socs_74"
  [_bind_gPoo_socs_74] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPoo_socs_74"
rewards "_unbind_gPoo_socs_74"
  [_unbind_gPoo_socs_74] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gooP_socs_75"
rewards "_bind_gooP_socs_75"
  [_bind_gooP_socs_75] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gooP_socs_75"
rewards "_unbind_gooP_socs_75"
  [_unbind_gooP_socs_75] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPooP_socs_76"
rewards "_bind_gPooP_socs_76"
  [_bind_gPooP_socs_76] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPooP_socs_76"
```

```
rewards "_unbind_gPooP_socs_76"
  [_unbind_gPooP_socs_76] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPooP_socs_77"
rewards "_bind_gPooP_socs_77"
  [_bind_gPooP_socs_77] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPooP_socs_77"
rewards "_unbind_gPooP_socs_77"
  [_unbind_gPooP_socs_77] true : 1;
endrewards

// count rewards: "number of occurrences of bind_sgPooP_socs_78"
rewards "_bind_sgPooP_socs_78"
  [_bind_sgPooP_socs_78] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_sgPooP_socs_78"
rewards "_unbind_sgPooP_socs_78"
  [_unbind_sgPooP_socs_78] true : 1;
endrewards

// count rewards: "number of occurrences of bind_gPooPs_socs_79"
rewards "_bind_gPooPs_socs_79"
  [_bind_gPooPs_socs_79] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_gPooPs_socs_79"
rewards "_unbind_gPooPs_socs_79"
  [_unbind_gPooPs_socs_79] true : 1;
endrewards

// count rewards: "number of occurrences of bind_pias_stat_80"
rewards "_bind_pias_stat_80"
  [_bind_pias_stat_80] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_pias_stat_80"
rewards "_unbind_pias_stat_80"
  [_unbind_pias_stat_80] true : 1;
endrewards

// count rewards: "number of occurrences of degr_socs_81"
rewards "_degr_socs_81"
  [_degr_socs_81] true : 1;
endrewards

// rewards: "number of LIF molecules present"
```

```
rewards "_LIF"
  true : _LIF;
endrewards

// rewards: "square of number of LIF molecules present"
rewards "_LIF_squared"
  true : _LIF * _LIF;
endrewards

// rewards: "number of gp130 molecules present"
rewards "_gp130"
  true : _gp130;
endrewards

// rewards: "square of number of gp130 molecules present"
rewards "_gp130_squared"
  true : _gp130 * _gp130;
endrewards

// rewards: "number of LIFR molecules present"
rewards "_LIFR"
  true : _LIFR;
endrewards

// rewards: "square of number of LIFR molecules present"
rewards "_LIFR_squared"
  true : _LIFR * _LIFR;
endrewards

// rewards: "number of OSM molecules present"
rewards "_OSM"
  true : _OSM;
endrewards

// rewards: "square of number of OSM molecules present"
rewards "_OSM_squared"
  true : _OSM * _OSM;
endrewards

// rewards: "number of OSMR molecules present"
rewards "_OSMR"
  true : _OSMR;
endrewards

// rewards: "square of number of OSMR molecules present"
rewards "_OSMR_squared"
  true : _OSMR * _OSMR;
endrewards

// rewards: "number of gp130:LIF:LIFR molecules present"
```

```
rewards "_gp130_colon_LIF_colon_LIFR"
  true : _gp130_colon_LIF_colon_LIFR;
endrewards

// rewards: "square of number of gp130:LIF:LIFR molecules present"
rewards "_gp130_colon_LIF_colon_LIFR_squared"
  true : _gp130_colon_LIF_colon_LIFR * _gp130_colon_LIF_colon_LIFR;
endrewards

// rewards: "number of gp130:OSM:LIFR molecules present"
rewards "_gp130_colon_OSM_colon_LIFR"
  true : _gp130_colon_OSM_colon_LIFR;
endrewards

// rewards: "square of number of gp130:OSM:LIFR molecules present"
rewards "_gp130_colon_OSM_colon_LIFR_squared"
  true : _gp130_colon_OSM_colon_LIFR * _gp130_colon_OSM_colon_LIFR;
endrewards

// rewards: "number of gp130:OSM:OSMR molecules present"
rewards "_gp130_colon_OSM_colon_OSMR"
  true : _gp130_colon_OSM_colon_OSMR;
endrewards

// rewards: "square of number of gp130:OSM:OSMR molecules present"
rewards "_gp130_colon_OSM_colon_OSMR_squared"
  true : _gp130_colon_OSM_colon_OSMR * _gp130_colon_OSM_colon_OSMR;
endrewards

// rewards: "number of gp130_P:LIF:LIFR molecules present"
rewards "_gp130_P_colon_LIF_colon_LIFR"
  true : _gp130_P_colon_LIF_colon_LIFR;
endrewards

// rewards: "square of number of gp130_P:LIF:LIFR molecules present"
rewards "_gp130_P_colon_LIF_colon_LIFR_squared"
  true : _gp130_P_colon_LIF_colon_LIFR * _gp130_P_colon_LIF_colon_LIFR;
endrewards

// rewards: "number of gp130:LIF:LIFR_P molecules present"
rewards "_gp130_colon_LIF_colon_LIFR_P"
  true : _gp130_colon_LIF_colon_LIFR_P;
endrewards

// rewards: "square of number of gp130:LIF:LIFR_P molecules present"
rewards "_gp130_colon_LIF_colon_LIFR_P_squared"
  true : _gp130_colon_LIF_colon_LIFR_P * _gp130_colon_LIF_colon_LIFR_P;
endrewards

// rewards: "number of gp130_P:LIF:LIFR_P molecules present"
```

```
rewards "_gp130_P_colon_LIF_colon_LIFR_P"
  true : _gp130_P_colon_LIF_colon_LIFR_P;
endrewards

// rewards: "square of number of gp130_P:LIF:LIFR_P molecules present"
rewards "_gp130_P_colon_LIF_colon_LIFR_P_squared"
  true : _gp130_P_colon_LIF_colon_LIFR_P * _gp130_P_colon_LIF_colon_LIFR_P;
endrewards

// rewards: "number of gp130_P:OSM:LIFR molecules present"
rewards "_gp130_P_colon_OSM_colon_LIFR"
  true : _gp130_P_colon_OSM_colon_LIFR;
endrewards

// rewards: "square of number of gp130_P:OSM:LIFR molecules present"
rewards "_gp130_P_colon_OSM_colon_LIFR_squared"
  true : _gp130_P_colon_OSM_colon_LIFR * _gp130_P_colon_OSM_colon_LIFR;
endrewards

// rewards: "number of gp130:OSM:LIFR_P molecules present"
rewards "_gp130_colon_OSM_colon_LIFR_P"
  true : _gp130_colon_OSM_colon_LIFR_P;
endrewards

// rewards: "square of number of gp130:OSM:LIFR_P molecules present"
rewards "_gp130_colon_OSM_colon_LIFR_P_squared"
  true : _gp130_colon_OSM_colon_LIFR_P * _gp130_colon_OSM_colon_LIFR_P;
endrewards

// rewards: "number of gp130_P:OSM:LIFR_P molecules present"
rewards "_gp130_P_colon_OSM_colon_LIFR_P"
  true : _gp130_P_colon_OSM_colon_LIFR_P;
endrewards

// rewards: "square of number of gp130_P:OSM:LIFR_P molecules present"
rewards "_gp130_P_colon_OSM_colon_LIFR_P_squared"
  true : _gp130_P_colon_OSM_colon_LIFR_P * _gp130_P_colon_OSM_colon_LIFR_P;
endrewards

// rewards: "number of gp130_P:OSM:OSMR molecules present"
rewards "_gp130_P_colon_OSM_colon_OSMR"
  true : _gp130_P_colon_OSM_colon_OSMR;
endrewards

// rewards: "square of number of gp130_P:OSM:OSMR molecules present"
rewards "_gp130_P_colon_OSM_colon_OSMR_squared"
  true : _gp130_P_colon_OSM_colon_OSMR * _gp130_P_colon_OSM_colon_OSMR;
endrewards

// rewards: "number of gp130:OSM:OSMR_P molecules present"
```

```
rewards "_gp130_colon_OSM_colon_OSMR_P"
  true : _gp130_colon_OSM_colon_OSMR_P;
endrewards

// rewards: "square of number of gp130:OSM:OSMR_P molecules present"
rewards "_gp130_colon_OSM_colon_OSMR_P_squared"
  true : _gp130_colon_OSM_colon_OSMR_P * _gp130_colon_OSM_colon_OSMR_P;
endrewards

// rewards: "number of gp130_P:OSM:OSMR_P molecules present"
rewards "_gp130_P_colon_OSM_colon_OSMR_P"
  true : _gp130_P_colon_OSM_colon_OSMR_P;
endrewards

// rewards: "square of number of gp130_P:OSM:OSMR_P molecules present"
rewards "_gp130_P_colon_OSM_colon_OSMR_P_squared"
  true : _gp130_P_colon_OSM_colon_OSMR_P * _gp130_P_colon_OSM_colon_OSMR_P;
endrewards

// rewards: "number of STAT3:gp130_P:LIF:LIFR molecules present"
rewards "_STAT3_colon_gp130_P_colon_LIF_colon_LIFR"
  true : _STAT3_colon_gp130_P_colon_LIF_colon_LIFR;
endrewards

// rewards: "square of number of STAT3:gp130_P:LIF:LIFR molecules present"
rewards "_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_squared"
  true : _STAT3_colon_gp130_P_colon_LIF_colon_LIFR * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR;
endrewards

// rewards: "number of gp130:LIF:LIFR_P:STAT3 molecules present"
rewards "_gp130_colon_LIF_colon_LIFR_P_colon_STAT3"
  true : _gp130_colon_LIF_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "square of number of gp130:LIF:LIFR_P:STAT3 molecules present"
rewards "_gp130_colon_LIF_colon_LIFR_P_colon_STAT3_squared"
  true : _gp130_colon_LIF_colon_LIFR_P_colon_STAT3 * _gp130_colon_LIF_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:LIF:LIFR_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P"
  true : _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P;
endrewards

// rewards: "square of number of STAT3:gp130_P:LIF:LIFR_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_squared"
  true : _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P * _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P;
endrewards

// rewards: "number of gp130_P:LIF:LIFR_P:STAT3 molecules present"
```

```
rewards "_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3"
  true : _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "square of number of gp130_P:LIF:LIFR_P:STAT3 molecules present"
rewards "_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_squared"
  true : _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 * _gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:LIF:LIFR_P:STAT3 molecules present"
rewards "_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3"
  true : _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "square of number of STAT3:gp130_P:LIF:LIFR_P:STAT3 molecules present"
rewards "_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_squared"
  true : _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 *
         _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:OSM:LIFR molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_LIFR"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_LIFR;
endrewards

// rewards: "square of number of STAT3:gp130_P:OSM:LIFR molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_squared"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_LIFR * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR;
endrewards

// rewards: "number of gp130:OSM:LIFR_P:STAT3 molecules present"
rewards "_gp130_colon_OSM_colon_LIFR_P_colon_STAT3"
  true : _gp130_colon_OSM_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "square of number of gp130:OSM:LIFR_P:STAT3 molecules present"
rewards "_gp130_colon_OSM_colon_LIFR_P_colon_STAT3_squared"
  true : _gp130_colon_OSM_colon_LIFR_P_colon_STAT3 * _gp130_colon_OSM_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:OSM:LIFR_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P;
endrewards

// rewards: "square of number of STAT3:gp130_P:OSM:LIFR_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_squared"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P * _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P;
endrewards
```

```
// rewards: "number of gp130_P:OSM:LIFR_P:STAT3 molecules present"
rewards "_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3"
  true : _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "square of number of gp130_P:OSM:LIFR_P:STAT3 molecules present"
rewards "_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_squared"
  true : _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 * _gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:OSM:LIFR_P:STAT3 molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "square of number of STAT3:gp130_P:OSM:LIFR_P:STAT3 molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_squared"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 *
         _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:OSM:OSMR molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_OSMR"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_OSMR;
endrewards

// rewards: "square of number of STAT3:gp130_P:OSM:OSMR molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_squared"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_OSMR * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR;
endrewards

// rewards: "number of gp130:OSM:OSMR_P:STAT3 molecules present"
rewards "_gp130_colon_OSM_colon_OSMR_P_colon_STAT3"
  true : _gp130_colon_OSM_colon_OSMR_P_colon_STAT3;
endrewards

// rewards: "square of number of gp130:OSM:OSMR_P:STAT3 molecules present"
rewards "_gp130_colon_OSM_colon_OSMR_P_colon_STAT3_squared"
  true : _gp130_colon_OSM_colon_OSMR_P_colon_STAT3 * _gp130_colon_OSM_colon_OSMR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:OSM:OSMR_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P;
endrewards

// rewards: "square of number of STAT3:gp130_P:OSM:OSMR_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_squared"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P * _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P;
endrewards
```

```
// rewards: "number of gp130_P:OSM:OSMR_P:STAT3 molecules present"
rewards "_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3"
  true : _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3;
endrewards

// rewards: "square of number of gp130_P:OSM:OSMR_P:STAT3 molecules present"
rewards "_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_squared"
  true : _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 * _gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:OSM:OSMR_P:STAT3 molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3;
endrewards

// rewards: "square of number of STAT3:gp130_P:OSM:OSMR_P:STAT3 molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_squared"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 *
         _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3_P:gp130_P:LIF:LIFR_P:STAT3 molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3"
  true : _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "square of number of STAT3_P:gp130_P:LIF:LIFR_P:STAT3 molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_squared"
  true : _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3 *
         _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:LIF:LIFR_P:STAT3_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P"
  true : _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P;
endrewards

// rewards: "square of number of STAT3:gp130_P:LIF:LIFR_P:STAT3_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P_squared"
  true : _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P *
         _STAT3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P;
endrewards

// rewards: "number of STAT3_P:gp130_P:LIF:LIFR_P:STAT3_P molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P"
  true : _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P;
endrewards

// rewards: "square of number of STAT3_P:gp130_P:LIF:LIFR_P:STAT3_P molecules present"
```

```
rewards "_STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P_squared"
  true : _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P *
         _STAT3_P_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_STAT3_P;
endrewards

// rewards: "number of STAT3_P:gp130_P:OSM:LIFR_P:STAT3 molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3"
  true : _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "square of number of STAT3_P:gp130_P:OSM:LIFR_P:STAT3 molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_squared"
  true : _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3 *
         _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:OSM:LIFR_P:STAT3_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P;
endrewards

// rewards: "square of number of STAT3:gp130_P:OSM:LIFR_P:STAT3_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P_squared"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P *
         _STAT3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P;
endrewards

// rewards: "number of STAT3_P:gp130_P:OSM:LIFR_P:STAT3_P molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P"
  true : _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P;
endrewards

// rewards: "square of number of STAT3_P:gp130_P:OSM:LIFR_P:STAT3_P molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P_squared"
  true : _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P *
         _STAT3_P_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_STAT3_P;
endrewards

// rewards: "number of STAT3_P:gp130_P:OSM:OSMR_P:STAT3 molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3"
  true : _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3;
endrewards

// rewards: "square of number of STAT3_P:gp130_P:OSM:OSMR_P:STAT3 molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_squared"
  true : _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3 *
         _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3;
endrewards

// rewards: "number of STAT3:gp130_P:OSM:OSMR_P:STAT3_P molecules present"
```

```
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P;
endrewards

// rewards: "square of number of STAT3:gp130_P:OSM:OSMR_P:STAT3_P molecules present"
rewards "_STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P_squared"
  true : _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P *
         _STAT3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P;
endrewards

// rewards: "number of STAT3_P:gp130_P:OSM:OSMR_P:STAT3_P molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P"
  true : _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P;
endrewards

// rewards: "square of number of STAT3_P:gp130_P:OSM:OSMR_P:STAT3_P molecules present"
rewards "_STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P_squared"
  true : _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P *
         _STAT3_P_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_STAT3_P;
endrewards

// rewards: "number of STAT3_c molecules present"
rewards "_STAT3_c"
  true : _STAT3_c;
endrewards

// rewards: "square of number of STAT3_c molecules present"
rewards "_STAT3_c_squared"
  true : _STAT3_c * _STAT3_c;
endrewards

// rewards: "number of STAT3_PD_c molecules present"
rewards "_STAT3_PD_c"
  true : _STAT3_PD_c;
endrewards

// rewards: "square of number of STAT3_PD_c molecules present"
rewards "_STAT3_PD_c_squared"
  true : _STAT3_PD_c * _STAT3_PD_c;
endrewards

// rewards: "number of STAT3_PD_n molecules present"
rewards "_STAT3_PD_n"
  true : _STAT3_PD_n;
endrewards

// rewards: "square of number of STAT3_PD_n molecules present"
rewards "_STAT3_PD_n_squared"
  true : _STAT3_PD_n * _STAT3_PD_n;
endrewards
```

```
// rewards: "number of STAT3_n molecules present"
rewards "_STAT3_n"
  true : _STAT3_n;
endrewards

// rewards: "square of number of STAT3_n molecules present"
rewards "_STAT3_n_squared"
  true : _STAT3_n * _STAT3_n;
endrewards

// rewards: "number of SOCS3 molecules present"
rewards "_SOCS3"
  true : _SOCS3;
endrewards

// rewards: "square of number of SOCS3 molecules present"
rewards "_SOCS3_squared"
  true : _SOCS3 * _SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:LIF:LIFR molecules present"
rewards "_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR"
  true : _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR;
endrewards

// rewards: "square of number of SOCS3:gp130_P:LIF:LIFR molecules present"
rewards "_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_squared"
  true : _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR;
endrewards

// rewards: "number of gp130:LIF:LIFR_P:SOCS3 molecules present"
rewards "_gp130_colon_LIF_colon_LIFR_P_colon_SOCS3"
  true : _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "square of number of gp130:LIF:LIFR_P:SOCS3 molecules present"
rewards "_gp130_colon_LIF_colon_LIFR_P_colon_SOCS3_squared"
  true : _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3 * _gp130_colon_LIF_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:LIF:LIFR_P molecules present"
rewards "_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P"
  true : _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P;
endrewards

// rewards: "square of number of SOCS3:gp130_P:LIF:LIFR_P molecules present"
rewards "_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_squared"
  true : _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P * _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P;
endrewards
```

```
// rewards: "number of gp130_P:LIF:LIFR_P:SOCS3 molecules present"
rewards "_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3"
  true : _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "square of number of gp130_P:LIF:LIFR_P:SOCS3 molecules present"
rewards "_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3_squared"
  true : _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 * _gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:LIF:LIFR_P:SOCS3 molecules present"
rewards "_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3"
  true : _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "square of number of SOCS3:gp130_P:LIF:LIFR_P:SOCS3 molecules present"
rewards "_SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3_squared"
  true : _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3 *
         _SOCS3_colon_gp130_P_colon_LIF_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:OSM:LIFR molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR;
endrewards

// rewards: "square of number of SOCS3:gp130_P:OSM:LIFR molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_squared"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR;
endrewards

// rewards: "number of gp130:OSM:LIFR_P:SOCS3 molecules present"
rewards "_gp130_colon_OSM_colon_LIFR_P_colon_SOCS3"
  true : _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "square of number of gp130:OSM:LIFR_P:SOCS3 molecules present"
rewards "_gp130_colon_OSM_colon_LIFR_P_colon_SOCS3_squared"
  true : _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3 * _gp130_colon_OSM_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:OSM:LIFR_P molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P;
endrewards

// rewards: "square of number of SOCS3:gp130_P:OSM:LIFR_P molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_squared"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P * _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P;
```

```
endrewards

// rewards: "number of gp130_P:OSM:LIFR_P:SOCS3 molecules present"
rewards "_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3"
  true : _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "square of number of gp130_P:OSM:LIFR_P:SOCS3 molecules present"
rewards "_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3_squared"
  true : _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 * _gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:OSM:LIFR_P:SOCS3 molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "square of number of SOCS3:gp130_P:OSM:LIFR_P:SOCS3 molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3_squared"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3 *
         _SOCS3_colon_gp130_P_colon_OSM_colon_LIFR_P_colon_SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:OSM:OSMR molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR;
endrewards

// rewards: "square of number of SOCS3:gp130_P:OSM:OSMR molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_squared"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR;
endrewards

// rewards: "number of gp130:OSM:OSMR_P:SOCS3 molecules present"
rewards "_gp130_colon_OSM_colon_OSMR_P_colon_SOCS3"
  true : _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3;
endrewards

// rewards: "square of number of gp130:OSM:OSMR_P:SOCS3 molecules present"
rewards "_gp130_colon_OSM_colon_OSMR_P_colon_SOCS3_squared"
  true : _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3 * _gp130_colon_OSM_colon_OSMR_P_colon_SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:OSM:OSMR_P molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P;
endrewards

// rewards: "square of number of SOCS3:gp130_P:OSM:OSMR_P molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_squared"
```

```
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P * _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P;
endrewards

// rewards: "number of gp130_P:OSM:OSMR_P:SOCS3 molecules present"
rewards "_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3"
  true : _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3;
endrewards

// rewards: "square of number of gp130_P:OSM:OSMR_P:SOCS3 molecules present"
rewards "_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3_squared"
  true : _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 * _gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3;
endrewards

// rewards: "number of SOCS3:gp130_P:OSM:OSMR_P:SOCS3 molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3;
endrewards

// rewards: "square of number of SOCS3:gp130_P:OSM:OSMR_P:SOCS3 molecules present"
rewards "_SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3_squared"
  true : _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3 *
         _SOCS3_colon_gp130_P_colon_OSM_colon_OSMR_P_colon_SOCS3;
endrewards

// rewards: "number of PIAS3 molecules present"
rewards "_PIAS3"
  true : _PIAS3;
endrewards

// rewards: "square of number of PIAS3 molecules present"
rewards "_PIAS3_squared"
  true : _PIAS3 * _PIAS3;
endrewards

// rewards: "number of PIAS3:STAT3_PD_n molecules present"
rewards "_PIAS3_colon_STAT3_PD_n"
  true : _PIAS3_colon_STAT3_PD_n;
endrewards

// rewards: "square of number of PIAS3:STAT3_PD_n molecules present"
rewards "_PIAS3_colon_STAT3_PD_n_squared"
  true : _PIAS3_colon_STAT3_PD_n * _PIAS3_colon_STAT3_PD_n;
endrewards

// rewards: "number of res molecules present"
rewards "_res"
  true : _res;
endrewards

// rewards: "square of number of res molecules present"
```

```
rewards "_res_squared"
  true : _res * _res;
endrewards


// End PRISM model compiled from _gp130_STAT_exp_all
```

C PRISM file for ligands/receptors sub-model

```
// PRISM model compiled from Bio-PEPA input file "_gp130_STAT_exp_all" by
// Bio-PEPA Workbench Version 0.9.9 "Chad Smith" [25-August-2008]

ctmc

const double _k1 = 0.000000804583443684188;
const double _k2 = 0.00000804583443684188;
const double _k3 = 0.00000804583443684188;
const double _k4 = 0.000000804583443684188;
const double _k5 = 0.00000804583443684188;
const double _k6 = 0.00000804583443684188;
const double _k7 = 0.2;
const double _k8 = 0.2;
const double _k9 = 0.2;
const double _k10 = 0.2;
const double _k11 = 0.2;
const double _k12 = 0.2;
const double _k13 = 0.2;
const double _k14 = 0.2;
const double _k15 = 0.2;
const double _k16 = 0.2;
const double _k17 = 0.2;
const double _k18 = 0.2;
const double _exosol = 9.91E-012;
const double _cellMembrane = 1.26E-007;
const double _na = 6.02E+023;

module Rates

  [_bind_gl_l_1] ((_k1 * _gp130*H * _LIF*H * _LIFR*H  /H) > 0) ->
                 (_k1 * _gp130*H * _LIF*H * _LIFR*H  /H) : true;
  [_bind_ll_g_2] ((_k2 * _LIFR*H  * _LIF*H * _gp130*H /H) > 0) ->
                 (_k2 * _LIFR*H  * _LIF*H * _gp130*H /H) : true;
  [_bind_go_l_3] ((_k3 * _gp130*H * _OSM*H * _LIFR*H  /H) > 0) ->
                 (_k3 * _gp130*H * _OSM*H * _LIFR*H  /H) : true;
  [_bind_lo_g_4] ((_k4 * _LIFR*H  * _OSM*H * _gp130*H /H) > 0) ->
                 (_k4 * _LIFR*H  * _OSM*H * _gp130*H /H) : true;
  [_bind_oo_g_5] ((_k5 * _OSMR*H  * _OSM*H * _gp130*H /H) > 0) ->
                 (_k5 * _OSMR*H  * _OSM*H * _gp130*H /H) : true;
  [_bind_go_o_6] ((_k6 * _gp130*H * _OSM*H * _OSMR*H  /H) > 0) ->
                 (_k6 * _gp130*H * _OSM*H * _OSMR*H  /H) : true;
  [_phospho_gll_7] ((_k7  * _gp130_colon_LIF_colon_LIFR*H   /H) > 0) ->
                 (_k7  * _gp130_colon_LIF_colon_LIFR*H   /H) : true;
  [_phospho_gll_8] ((_k8  * _gp130_colon_LIF_colon_LIFR*H   /H) > 0) ->
                 (_k8  * _gp130_colon_LIF_colon_LIFR*H   /H) : true;
  [_phospho_gll_9] ((_k9  * _gp130_P_colon_LIF_colon_LIFR*H /H) > 0) ->
                 (_k9  * _gp130_P_colon_LIF_colon_LIFR*H /H) : true;
  [_phospho_gll_10] ((_k10 * _gp130_colon_LIF_colon_LIFR_P*H /H) > 0) ->
```

```
                (_k10 * _gp130_colon_LIF_colon_LIFR_P*H /H) : true;
  [_phospho_gol_11] ((_k11 * _gp130_colon_OSM_colon_LIFR*H   /H) > 0) ->
                (_k11 * _gp130_colon_OSM_colon_LIFR*H   /H) : true;
  [_phospho_gol_12] ((_k12 * _gp130_colon_OSM_colon_LIFR*H   /H) > 0) ->
                (_k12 * _gp130_colon_OSM_colon_LIFR*H   /H) : true;
  [_phospho_gol_13] ((_k13 * _gp130_P_colon_OSM_colon_LIFR*H /H) > 0) ->
                (_k13 * _gp130_P_colon_OSM_colon_LIFR*H /H) : true;
  [_phospho_gol_14] ((_k14 * _gp130_colon_OSM_colon_LIFR_P*H /H) > 0) ->
                (_k14 * _gp130_colon_OSM_colon_LIFR_P*H /H) : true;
  [_phospho_goo_15] ((_k15 * _gp130_colon_OSM_colon_OSMR*H   /H) > 0) ->
                (_k15 * _gp130_colon_OSM_colon_OSMR*H   /H) : true;
  [_phospho_goo_16] ((_k16 * _gp130_colon_OSM_colon_OSMR*H   /H) > 0) ->
                (_k16 * _gp130_colon_OSM_colon_OSMR*H   /H) : true;
  [_phospho_goo_17] ((_k17 * _gp130_P_colon_OSM_colon_OSMR*H /H) > 0) ->
                (_k17 * _gp130_P_colon_OSM_colon_OSMR*H /H) : true;
  [_phospho_goo_18] ((_k18 * _gp130_colon_OSM_colon_OSMR_P*H /H) > 0) ->
                (_k18 * _gp130_colon_OSM_colon_OSMR_P*H /H) : true;

endmodule


const double H = 150;

const int MAX_LIF = 3000;
const int MAX_OSM = 3000;
const int MAX_gp130 = 1000;
const int MAX_LIFR = 1000;
const int MAX_OSMR = 1000;
const int MAX_gp130_colon_LIF_colon_LIFR = func(min,func(min,MAX_gp130,MAX_LIFR),MAX_LIF);
const int MAX_gp130_colon_OSM_colon_LIFR = func(min,func(min,MAX_gp130,MAX_LIFR),MAX_OSM);
const int MAX_gp130_colon_OSM_colon_OSMR = func(min,func(min,MAX_gp130,MAX_OSMR),MAX_OSM);
const int MAX_gp130_P_colon_LIF_colon_LIFR = MAX_gp130_colon_LIF_colon_LIFR;
const int MAX_gp130_colon_LIF_colon_LIFR_P = MAX_gp130_colon_LIF_colon_LIFR;
const int MAX_gp130_P_colon_LIF_colon_LIFR_P = MAX_gp130_colon_LIF_colon_LIFR;
const int MAX_gp130_P_colon_OSM_colon_LIFR = MAX_gp130_colon_OSM_colon_LIFR;
const int MAX_gp130_colon_OSM_colon_LIFR_P = MAX_gp130_colon_OSM_colon_LIFR;
const int MAX_gp130_P_colon_OSM_colon_LIFR_P = MAX_gp130_colon_OSM_colon_LIFR;
const int MAX_gp130_P_colon_OSM_colon_OSMR = MAX_gp130_colon_OSM_colon_OSMR;
const int MAX_gp130_colon_OSM_colon_OSMR_P = MAX_gp130_colon_OSM_colon_OSMR;
const int MAX_gp130_P_colon_OSM_colon_OSMR_P = MAX_gp130_colon_OSM_colon_OSMR;

const int MIN_LIF = 2000;
const int MIN_OSM = 2000;
const int MIN_gp130 = 0;
const int MIN_LIFR = 0;
const int MIN_OSMR = 0;
const int MIN_gp130_colon_LIF_colon_LIFR = 0;
const int MIN_gp130_colon_OSM_colon_LIFR = 0;
const int MIN_gp130_colon_OSM_colon_OSMR = 0;
const int MIN_gp130_P_colon_LIF_colon_LIFR = 0;
```

```
const int MIN_gp130_colon_LIF_colon_LIFR_P = 0;
const int MIN_gp130_P_colon_LIF_colon_LIFR_P = 0;
const int MIN_gp130_P_colon_OSM_colon_LIFR = 0;
const int MIN_gp130_colon_OSM_colon_LIFR_P = 0;
const int MIN_gp130_P_colon_OSM_colon_LIFR_P = 0;
const int MIN_gp130_P_colon_OSM_colon_OSMR = 0;
const int MIN_gp130_colon_OSM_colon_OSMR_P = 0;
const int MIN_gp130_P_colon_OSM_colon_OSMR_P = 0;

const int N_LIF = func(floor,MAX_LIF/H);
const int N_OSM = func(floor,MAX_OSM/H);
const int N_gp130 = func(floor,MAX_gp130/H);
const int N_LIFR = func(floor,MAX_LIFR/H);
const int N_OSMR = func(floor,MAX_OSMR/H);
const int N_gp130_colon_LIF_colon_LIFR = func(floor,MAX_gp130_colon_LIF_colon_LIFR/H);
const int N_gp130_colon_OSM_colon_LIFR = func(floor,MAX_gp130_colon_OSM_colon_LIFR/H);
const int N_gp130_colon_OSM_colon_OSMR = func(floor,MAX_gp130_colon_OSM_colon_OSMR/H);
const int N_gp130_P_colon_LIF_colon_LIFR = func(floor,MAX_gp130_P_colon_LIF_colon_LIFR/H);
const int N_gp130_colon_LIF_colon_LIFR_P = func(floor,MAX_gp130_colon_LIF_colon_LIFR_P/H);
const int N_gp130_P_colon_LIF_colon_LIFR_P = func(floor,MAX_gp130_P_colon_LIF_colon_LIFR_P/H);
const int N_gp130_P_colon_OSM_colon_LIFR = func(floor,MAX_gp130_P_colon_OSM_colon_LIFR/H);
const int N_gp130_colon_OSM_colon_LIFR_P = func(floor,MAX_gp130_colon_OSM_colon_LIFR_P/H);
const int N_gp130_P_colon_OSM_colon_LIFR_P = func(floor,MAX_gp130_P_colon_OSM_colon_LIFR_P/H);
const int N_gp130_P_colon_OSM_colon_OSMR = func(floor,MAX_gp130_P_colon_OSM_colon_OSMR/H);
const int N_gp130_colon_OSM_colon_OSMR_P = func(floor,MAX_gp130_colon_OSM_colon_OSMR_P/H);
const int N_gp130_P_colon_OSM_colon_OSMR_P = func(floor,MAX_gp130_P_colon_OSM_colon_OSMR_P/H);

const int NL_LIF = func(floor,MIN_LIF/H);
const int NL_OSM = func(floor,MIN_OSM/H);
const int NL_gp130 = func(floor,MIN_gp130/H);
const int NL_LIFR = func(floor,MIN_LIFR/H);
const int NL_OSMR = func(floor,MIN_OSMR/H);
const int NL_gp130_colon_LIF_colon_LIFR = func(floor,MIN_gp130_colon_LIF_colon_LIFR/H);
const int NL_gp130_colon_OSM_colon_LIFR = func(floor,MIN_gp130_colon_OSM_colon_LIFR/H);
const int NL_gp130_colon_OSM_colon_OSMR = func(floor,MIN_gp130_colon_OSM_colon_OSMR/H);
const int NL_gp130_P_colon_LIF_colon_LIFR = func(floor,MIN_gp130_P_colon_LIF_colon_LIFR/H);
const int NL_gp130_colon_LIF_colon_LIFR_P = func(floor,MIN_gp130_colon_LIF_colon_LIFR_P/H);
const int NL_gp130_P_colon_LIF_colon_LIFR_P = func(floor,MIN_gp130_P_colon_LIF_colon_LIFR_P/H);
const int NL_gp130_P_colon_OSM_colon_LIFR = func(floor,MIN_gp130_P_colon_OSM_colon_LIFR/H);
const int NL_gp130_colon_OSM_colon_LIFR_P = func(floor,MIN_gp130_colon_OSM_colon_LIFR_P/H);
const int NL_gp130_P_colon_OSM_colon_LIFR_P = func(floor,MIN_gp130_P_colon_OSM_colon_LIFR_P/H);
const int NL_gp130_P_colon_OSM_colon_OSMR = func(floor,MIN_gp130_P_colon_OSM_colon_OSMR/H);
const int NL_gp130_colon_OSM_colon_OSMR_P = func(floor,MIN_gp130_colon_OSM_colon_OSMR_P/H);
const int NL_gp130_P_colon_OSM_colon_OSMR_P = func(floor,MIN_gp130_P_colon_OSM_colon_OSMR_P/H);


module _LIF

  _LIF : [NL_LIF..N_LIF] init N_LIF;
```

```
  [_bind_gl_l_1] (_LIF >= 1 + NL_LIF) -> 1 : (_LIF' = _LIF - 1);
  [_bind_ll_g_2] (_LIF >= 1 + NL_LIF) -> 1 : (_LIF' = _LIF - 1);

endmodule

module _gp130

  _gp130 : [NL_gp130..N_gp130] init N_gp130;

  [_bind_gl_l_1] (_gp130 >= 1 + NL_gp130) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_go_l_3] (_gp130 >= 1 + NL_gp130) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_go_o_6] (_gp130 >= 1 + NL_gp130) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_ll_g_2] (_gp130 >= 1 + NL_gp130) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_lo_g_4] (_gp130 >= 1 + NL_gp130) -> 1 : (_gp130' = _gp130 - 1);
  [_bind_oo_g_5] (_gp130 >= 1 + NL_gp130) -> 1 : (_gp130' = _gp130 - 1);

endmodule

module _LIFR

  _LIFR : [NL_LIFR..N_LIFR] init N_LIFR;

  [_bind_ll_g_2] (_LIFR >= 1 + NL_LIFR) -> 1 : (_LIFR' = _LIFR - 1);
  [_bind_lo_g_4] (_LIFR >= 1 + NL_LIFR) -> 1 : (_LIFR' = _LIFR - 1);
  [_bind_gl_l_1] (_LIFR >= 1 + NL_LIFR) -> 1 : (_LIFR' = _LIFR - 1);
  [_bind_go_l_3] (_LIFR >= 1 + NL_LIFR) -> 1 : (_LIFR' = _LIFR - 1);

endmodule

module _OSM

  _OSM : [NL_OSM..N_OSM] init N_OSM;

  [_bind_go_l_3] (_OSM >= 1 + NL_OSM) -> 1 : (_OSM' = _OSM - 1);
  [_bind_lo_g_4] (_OSM >= 1 + NL_OSM) -> 1 : (_OSM' = _OSM - 1);
  [_bind_oo_g_5] (_OSM >= 1 + NL_OSM) -> 1 : (_OSM' = _OSM - 1);
  [_bind_go_o_6] (_OSM >= 1 + NL_OSM) -> 1 : (_OSM' = _OSM - 1);

endmodule

module _OSMR

  _OSMR : [NL_OSMR..N_OSMR] init N_OSMR;

  [_bind_oo_g_5] (_OSMR >= 1 + NL_OSMR) -> 1 : (_OSMR' = _OSMR - 1);
  [_bind_go_o_6] (_OSMR >= 1 + NL_OSMR) -> 1 : (_OSMR' = _OSMR - 1);

endmodule

module _gp130_colon_LIF_colon_LIFR
```

```
  _gp130_colon_LIF_colon_LIFR :
  [NL_gp130_colon_LIF_colon_LIFR..N_gp130_colon_LIF_colon_LIFR] init 0;

  [_bind_gl_l_1] (_gp130_colon_LIF_colon_LIFR + 1 <= N_gp130_colon_LIF_colon_LIFR) ->
                 1 : (_gp130_colon_LIF_colon_LIFR' = _gp130_colon_LIF_colon_LIFR + 1);
  [_bind_ll_g_2] (_gp130_colon_LIF_colon_LIFR + 1 <= N_gp130_colon_LIF_colon_LIFR) ->
                 1 : (_gp130_colon_LIF_colon_LIFR' = _gp130_colon_LIF_colon_LIFR + 1);
  [_phospho_gll_7] (_gp130_colon_LIF_colon_LIFR >= 1) ->
                 1 : (_gp130_colon_LIF_colon_LIFR' = _gp130_colon_LIF_colon_LIFR - 1);
  [_phospho_gll_8] (_gp130_colon_LIF_colon_LIFR >= 1) ->
                 1 : (_gp130_colon_LIF_colon_LIFR' = _gp130_colon_LIF_colon_LIFR - 1);

endmodule

module _gp130_colon_OSM_colon_LIFR

  _gp130_colon_OSM_colon_LIFR :
  [NL_gp130_colon_OSM_colon_LIFR..N_gp130_colon_OSM_colon_LIFR] init 0;

  [_bind_go_l_3] (_gp130_colon_OSM_colon_LIFR + 1 <= N_gp130_colon_OSM_colon_LIFR) ->
                 1 : (_gp130_colon_OSM_colon_LIFR' = _gp130_colon_OSM_colon_LIFR + 1);
  [_bind_lo_g_4] (_gp130_colon_OSM_colon_LIFR + 1 <= N_gp130_colon_OSM_colon_LIFR) ->
                 1 : (_gp130_colon_OSM_colon_LIFR' = _gp130_colon_OSM_colon_LIFR + 1);
  [_phospho_gol_11] (_gp130_colon_OSM_colon_LIFR >= 1) ->
                 1 : (_gp130_colon_OSM_colon_LIFR' = _gp130_colon_OSM_colon_LIFR - 1);
  [_phospho_gol_12] (_gp130_colon_OSM_colon_LIFR >= 1) ->
                 1 : (_gp130_colon_OSM_colon_LIFR' = _gp130_colon_OSM_colon_LIFR - 1);

endmodule

module _gp130_colon_OSM_colon_OSMR

  _gp130_colon_OSM_colon_OSMR :
  [NL_gp130_colon_OSM_colon_OSMR..N_gp130_colon_OSM_colon_OSMR] init 0;

  [_bind_oo_g_5] (_gp130_colon_OSM_colon_OSMR + 1 <= N_gp130_colon_OSM_colon_OSMR) ->
                 1 : (_gp130_colon_OSM_colon_OSMR' = _gp130_colon_OSM_colon_OSMR + 1);
  [_bind_go_o_6] (_gp130_colon_OSM_colon_OSMR + 1 <= N_gp130_colon_OSM_colon_OSMR) ->
                 1 : (_gp130_colon_OSM_colon_OSMR' = _gp130_colon_OSM_colon_OSMR + 1);
  [_phospho_goo_15] (_gp130_colon_OSM_colon_OSMR >= 1) ->
                 1 : (_gp130_colon_OSM_colon_OSMR' = _gp130_colon_OSM_colon_OSMR - 1);
  [_phospho_goo_16] (_gp130_colon_OSM_colon_OSMR >= 1) ->
                 1 : (_gp130_colon_OSM_colon_OSMR' = _gp130_colon_OSM_colon_OSMR - 1);

endmodule

module _gp130_P_colon_LIF_colon_LIFR

  _gp130_P_colon_LIF_colon_LIFR :
```

```
  [NL_gp130_P_colon_LIF_colon_LIFR..N_gp130_P_colon_LIF_colon_LIFR] init 0;

  [_phospho_gll_7] (_gp130_P_colon_LIF_colon_LIFR + 1 <= N_gp130_P_colon_LIF_colon_LIFR) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR' = _gp130_P_colon_LIF_colon_LIFR + 1);
  [_phospho_gll_9] (_gp130_P_colon_LIF_colon_LIFR >= 1 + NL_gp130_P_colon_LIF_colon_LIFR) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR' = _gp130_P_colon_LIF_colon_LIFR - 1);

endmodule

module _gp130_colon_LIF_colon_LIFR_P

  _gp130_colon_LIF_colon_LIFR_P :
  [NL_gp130_colon_LIF_colon_LIFR_P..N_gp130_colon_LIF_colon_LIFR_P] init 0;

  [_phospho_gll_8] (_gp130_colon_LIF_colon_LIFR_P + 1 <= N_gp130_colon_LIF_colon_LIFR_P) ->
                1 : (_gp130_colon_LIF_colon_LIFR_P' = _gp130_colon_LIF_colon_LIFR_P + 1);
  [_phospho_gll_10] (_gp130_colon_LIF_colon_LIFR_P >= 1 + NL_gp130_colon_LIF_colon_LIFR_P) ->
                1 : (_gp130_colon_LIF_colon_LIFR_P' = _gp130_colon_LIF_colon_LIFR_P - 1);

endmodule

module _gp130_P_colon_LIF_colon_LIFR_P

  _gp130_P_colon_LIF_colon_LIFR_P :
  [NL_gp130_P_colon_LIF_colon_LIFR_P..N_gp130_P_colon_LIF_colon_LIFR_P] init 0;

  [_phospho_gll_9] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= N_gp130_P_colon_LIF_colon_LIFR_P) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);
  [_phospho_gll_10] (_gp130_P_colon_LIF_colon_LIFR_P + 1 <= N_gp130_P_colon_LIF_colon_LIFR_P) ->
                1 : (_gp130_P_colon_LIF_colon_LIFR_P' = _gp130_P_colon_LIF_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_LIFR

  _gp130_P_colon_OSM_colon_LIFR :
  [NL_gp130_P_colon_OSM_colon_LIFR..N_gp130_P_colon_OSM_colon_LIFR] init 0;

  [_phospho_gol_11] (_gp130_P_colon_OSM_colon_LIFR + 1 <= N_gp130_P_colon_OSM_colon_LIFR) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR' = _gp130_P_colon_OSM_colon_LIFR + 1);
  [_phospho_gol_13] (_gp130_P_colon_OSM_colon_LIFR >= 1 + NL_gp130_P_colon_OSM_colon_LIFR) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR' = _gp130_P_colon_OSM_colon_LIFR - 1);

endmodule

module _gp130_colon_OSM_colon_LIFR_P

  _gp130_colon_OSM_colon_LIFR_P :
  [NL_gp130_colon_OSM_colon_LIFR_P..N_gp130_colon_OSM_colon_LIFR_P] init 0;
```

```
  [_phospho_gol_12] (_gp130_colon_OSM_colon_LIFR_P + 1 <= N_gp130_colon_OSM_colon_LIFR_P) ->
                1 : (_gp130_colon_OSM_colon_LIFR_P' = _gp130_colon_OSM_colon_LIFR_P + 1);
  [_phospho_gol_14] (_gp130_colon_OSM_colon_LIFR_P >= 1 + NL_gp130_colon_OSM_colon_LIFR_P) ->
                1 : (_gp130_colon_OSM_colon_LIFR_P' = _gp130_colon_OSM_colon_LIFR_P - 1);

endmodule

module _gp130_P_colon_OSM_colon_LIFR_P

  _gp130_P_colon_OSM_colon_LIFR_P :
  [NL_gp130_P_colon_OSM_colon_LIFR_P..N_gp130_P_colon_OSM_colon_LIFR_P] init 0;

  [_phospho_gol_13] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= N_gp130_P_colon_OSM_colon_LIFR_P) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);
  [_phospho_gol_14] (_gp130_P_colon_OSM_colon_LIFR_P + 1 <= N_gp130_P_colon_OSM_colon_LIFR_P) ->
                1 : (_gp130_P_colon_OSM_colon_LIFR_P' = _gp130_P_colon_OSM_colon_LIFR_P + 1);

endmodule

module _gp130_P_colon_OSM_colon_OSMR

  _gp130_P_colon_OSM_colon_OSMR :
  [NL_gp130_P_colon_OSM_colon_OSMR..N_gp130_P_colon_OSM_colon_OSMR] init 0;

  [_phospho_goo_15] (_gp130_P_colon_OSM_colon_OSMR + 1 <= N_gp130_P_colon_OSM_colon_OSMR) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR' = _gp130_P_colon_OSM_colon_OSMR + 1);
  [_phospho_goo_17] (_gp130_P_colon_OSM_colon_OSMR >= 1 + NL_gp130_P_colon_OSM_colon_OSMR) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR' = _gp130_P_colon_OSM_colon_OSMR - 1);

endmodule

module _gp130_colon_OSM_colon_OSMR_P

  _gp130_colon_OSM_colon_OSMR_P :
  [NL_gp130_colon_OSM_colon_OSMR_P..N_gp130_colon_OSM_colon_OSMR_P] init 0;

  [_phospho_goo_16] (_gp130_colon_OSM_colon_OSMR_P + 1 <= N_gp130_colon_OSM_colon_OSMR_P) ->
                1 : (_gp130_colon_OSM_colon_OSMR_P' = _gp130_colon_OSM_colon_OSMR_P + 1);
  [_phospho_goo_18] (_gp130_colon_OSM_colon_OSMR_P >= 1 + NL_gp130_colon_OSM_colon_OSMR_P) ->
                1 : (_gp130_colon_OSM_colon_OSMR_P' = _gp130_colon_OSM_colon_OSMR_P - 1);

endmodule

module _gp130_P_colon_OSM_colon_OSMR_P

  _gp130_P_colon_OSM_colon_OSMR_P :
  [NL_gp130_P_colon_OSM_colon_OSMR_P..N_gp130_P_colon_OSM_colon_OSMR_P] init 0;

  [_phospho_goo_17] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= N_gp130_P_colon_OSM_colon_OSMR_P) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);
```

```
  [_phospho_goo_18] (_gp130_P_colon_OSM_colon_OSMR_P + 1 <= N_gp130_P_colon_OSM_colon_OSMR_P) ->
                1 : (_gp130_P_colon_OSM_colon_OSMR_P' = _gp130_P_colon_OSM_colon_OSMR_P + 1);

endmodule


// count rewards: "number of occurrences of bind_gl_l_1", rew 1
rewards "_bind_gl_l_1"
  [_bind_gl_l_1] true : 1;
endrewards

// count rewards: "number of occurrences of bind_ll_g_2", rew 2
rewards "_bind_ll_g_2"
  [_bind_ll_g_2] true : 1;
endrewards

// count rewards: "number of occurrences of bind_go_l_3", rew 3
rewards "_bind_go_l_3"
  [_bind_go_l_3] true : 1;
endrewards

// count rewards: "number of occurrences of bind_lo_g_4", rew 4
rewards "_bind_lo_g_4"
  [_bind_lo_g_4] true : 1;
endrewards

// count rewards: "number of occurrences of bind_oo_g_5", rew 5
rewards "_bind_oo_g_5"
  [_bind_oo_g_5] true : 1;
endrewards

// count rewards: "number of occurrences of bind_go_o_6", rew 6
rewards "_bind_go_o_6"
  [_bind_go_o_6] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gll_7", rew 7
rewards "_phospho_gll_7"
  [_phospho_gll_7] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gll_8", rew 8
rewards "_phospho_gll_8"
  [_phospho_gll_8] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gll_9", rew 9
rewards "_phospho_gll_9"
  [_phospho_gll_9] true : 1;
endrewards
```

```
// count rewards: "number of occurrences of phospho_gll_10", rew 10
rewards "_phospho_gll_10"
  [_phospho_gll_10] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gol_11", rew 11
rewards "_phospho_gol_11"
  [_phospho_gol_11] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gol_12", rew 12
rewards "_phospho_gol_12"
  [_phospho_gol_12] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gol_13", rew 13
rewards "_phospho_gol_13"
  [_phospho_gol_13] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_gol_14", rew 14
rewards "_phospho_gol_14"
  [_phospho_gol_14] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goo_15", rew 15
rewards "_phospho_goo_15"
  [_phospho_goo_15] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goo_16", rew 16
rewards "_phospho_goo_16"
  [_phospho_goo_16] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goo_17", rew 17
rewards "_phospho_goo_17"
  [_phospho_goo_17] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_goo_18", rew 18
rewards "_phospho_goo_18"
  [_phospho_goo_18] true : 1;
endrewards

// rewards: "number of LIF molecules present", rew 19
rewards "_LIF"
  true : _LIF*H;
endrewards
```

```
// rewards: "square of number of LIF molecules present", rew 20
rewards "_LIF_squared"
  true : _LIF*H * _LIF*H;
endrewards

// rewards: "number of gp130 molecules present", rew 21
rewards "_gp130"
  true : _gp130*H;
endrewards

// rewards: "square of number of gp130 molecules present", rew 22
rewards "_gp130_squared"
  true : _gp130*H * _gp130*H;
endrewards

// rewards: "number of LIFR molecules present", rew 23
rewards "_LIFR"
  true : _LIFR*H;
endrewards

// rewards: "square of number of LIFR molecules present", rew 24
rewards "_LIFR_squared"
  true : _LIFR*H * _LIFR*H;
endrewards

// rewards: "number of OSM molecules present", rew 25
rewards "_OSM"
  true : _OSM*H;
endrewards

// rewards: "square of number of OSM molecules present", rew 26
rewards "_OSM_squared"
  true : _OSM*H * _OSM*H;
endrewards

// rewards: "number of OSMR molecules present", rew 27
rewards "_OSMR"
  true : _OSMR*H;
endrewards

// rewards: "square of number of OSMR molecules present", rew 28
rewards "_OSMR_squared"
  true : _OSMR*H * _OSMR*H;
endrewards

// rewards: "number of gp130:LIF:LIFR molecules present", rew 29
rewards "_gp130_colon_LIF_colon_LIFR"
  true : _gp130_colon_LIF_colon_LIFR*H;
endrewards
```

```
// rewards: "square of number of gp130:LIF:LIFR molecules present", rew 30
rewards "_gp130_colon_LIF_colon_LIFR_squared"
  true : _gp130_colon_LIF_colon_LIFR*H * _gp130_colon_LIF_colon_LIFR*H;
endrewards

// rewards: "number of gp130:OSM:LIFR molecules present", rew 31
rewards "_gp130_colon_OSM_colon_LIFR"
  true : _gp130_colon_OSM_colon_LIFR*H;
endrewards

// rewards: "square of number of gp130:OSM:LIFR molecules present", rew 32
rewards "_gp130_colon_OSM_colon_LIFR_squared"
  true : _gp130_colon_OSM_colon_LIFR*H * _gp130_colon_OSM_colon_LIFR*H;
endrewards

// rewards: "number of gp130:OSM:OSMR molecules present", rew 33
rewards "_gp130_colon_OSM_colon_OSMR"
  true : _gp130_colon_OSM_colon_OSMR*H;
endrewards

// rewards: "square of number of gp130:OSM:OSMR molecules present", rew 34
rewards "_gp130_colon_OSM_colon_OSMR_squared"
  true : _gp130_colon_OSM_colon_OSMR*H * _gp130_colon_OSM_colon_OSMR*H;
endrewards

// rewards: "number of gp130_P:LIF:LIFR molecules present", rew 35
rewards "_gp130_P_colon_LIF_colon_LIFR"
  true : _gp130_P_colon_LIF_colon_LIFR*H;
endrewards

// rewards: "square of number of gp130_P:LIF:LIFR molecules present", rew 36
rewards "_gp130_P_colon_LIF_colon_LIFR_squared"
  true : _gp130_P_colon_LIF_colon_LIFR*H * _gp130_P_colon_LIF_colon_LIFR*H;
endrewards

// rewards: "number of gp130:LIF:LIFR_P molecules present", rew 37
rewards "_gp130_colon_LIF_colon_LIFR_P"
  true : _gp130_colon_LIF_colon_LIFR_P*H;
endrewards

// rewards: "square of number of gp130:LIF:LIFR_P molecules present", rew 38
rewards "_gp130_colon_LIF_colon_LIFR_P_squared"
  true : _gp130_colon_LIF_colon_LIFR_P*H * _gp130_colon_LIF_colon_LIFR_P*H;
endrewards

// rewards: "number of gp130_P:LIF:LIFR_P molecules present", rew 39
rewards "_gp130_P_colon_LIF_colon_LIFR_P"
  true : _gp130_P_colon_LIF_colon_LIFR_P*H;
endrewards
```

```
// rewards: "square of number of gp130_P:LIF:LIFR_P molecules present", rew 40
rewards "_gp130_P_colon_LIF_colon_LIFR_P_squared"
  true : _gp130_P_colon_LIF_colon_LIFR_P*H * _gp130_P_colon_LIF_colon_LIFR_P*H;
endrewards

// rewards: "number of gp130_P:OSM:LIFR molecules present", rew 41
rewards "_gp130_P_colon_OSM_colon_LIFR"
  true : _gp130_P_colon_OSM_colon_LIFR*H;
endrewards

// rewards: "square of number of gp130_P:OSM:LIFR molecules present", rew 42
rewards "_gp130_P_colon_OSM_colon_LIFR_squared"
  true : _gp130_P_colon_OSM_colon_LIFR*H * _gp130_P_colon_OSM_colon_LIFR*H;
endrewards

// rewards: "number of gp130:OSM:LIFR_P molecules present", rew 43
rewards "_gp130_colon_OSM_colon_LIFR_P"
  true : _gp130_colon_OSM_colon_LIFR_P*H;
endrewards

// rewards: "square of number of gp130:OSM:LIFR_P molecules present", rew 44
rewards "_gp130_colon_OSM_colon_LIFR_P_squared"
  true : _gp130_colon_OSM_colon_LIFR_P*H * _gp130_colon_OSM_colon_LIFR_P*H;
endrewards

// rewards: "number of gp130_P:OSM:LIFR_P molecules present", rew 45
rewards "_gp130_P_colon_OSM_colon_LIFR_P"
  true : _gp130_P_colon_OSM_colon_LIFR_P*H;
endrewards

// rewards: "square of number of gp130_P:OSM:LIFR_P molecules present", rew 46
rewards "_gp130_P_colon_OSM_colon_LIFR_P_squared"
  true : _gp130_P_colon_OSM_colon_LIFR_P*H * _gp130_P_colon_OSM_colon_LIFR_P*H;
endrewards

// rewards: "number of gp130_P:OSM:OSMR molecules present", rew 47
rewards "_gp130_P_colon_OSM_colon_OSMR"
  true : _gp130_P_colon_OSM_colon_OSMR*H;
endrewards

// rewards: "square of number of gp130_P:OSM:OSMR molecules present", rew 48
rewards "_gp130_P_colon_OSM_colon_OSMR_squared"
  true : _gp130_P_colon_OSM_colon_OSMR*H * _gp130_P_colon_OSM_colon_OSMR*H;
endrewards

// rewards: "number of gp130:OSM:OSMR_P molecules present", rew 49
rewards "_gp130_colon_OSM_colon_OSMR_P"
  true : _gp130_colon_OSM_colon_OSMR_P*H;
endrewards
```

```
// rewards: "square of number of gp130:OSM:OSMR_P molecules present", rew 50
rewards "_gp130_colon_OSM_colon_OSMR_P_squared"
  true : _gp130_colon_OSM_colon_OSMR_P*H * _gp130_colon_OSM_colon_OSMR_P*H;
endrewards

// rewards: "number of gp130_P:OSM:OSMR_P molecules present", rew 51
rewards "_gp130_P_colon_OSM_colon_OSMR_P"
  true : _gp130_P_colon_OSM_colon_OSMR_P*H;
endrewards

// rewards: "square of number of gp130_P:OSM:OSMR_P molecules present", rew 52
rewards "_gp130_P_colon_OSM_colon_OSMR_P_squared"
  true : _gp130_P_colon_OSM_colon_OSMR_P*H * _gp130_P_colon_OSM_colon_OSMR_P*H;
endrewards


// End PRISM model compiled from _gp130_STAT_exp_all
```

D PRISM file for downstream STAT3 sub-model

```
// PRISM model compiled from Bio-PEPA input file "_gp130_STAT_exp_all" by
// Bio-PEPA Workbench Version 0.9.9 "Chad Smith" [25-August-2008]

ctmc

const double _k27 = 0.000763006882957924;
const double _km27 = 0.06;
const double _k28 = 0.000381503441478962;
const double _km28 = 0.12;
const double _k43 = 0.4;
const double _k44 = 0.2;
const double _k58 = 1;
const double _k59 = 0.02;
const double _k60 = 15;
const double _k61 = 0.05;
const double _k62 = 0.0000953758603697404;
const double _km62 = 0.006;
const double _k63 = 0.0000476879301848702;
const double _km63 = 0.012;
const double _k80 = 0.000664451827242525;
const double _km80 = 0.4;
const double _k81 = 0.01;
const double _exosol = 9.91E-012;
const double _cellMembrane = 1.26E-007;
const double _cytosol = 2.09E-012;
const double _nucleus = 2.50E-013;
const double _na = 6.02E+023;

module Rates

  [_bind_rcpt_DP_stat_27] ((_k27  * _rcpt_DP*H * _STAT3_c*H /H) > 0) ->
                          (_k27  * _rcpt_DP*H * _STAT3_c*H /H) : true;
  [_unbind_rcpt_DP_stat_27] ((_km27 * _rcpt_DP_colon_STAT3*H /H) > 0) ->
                          (_km27 * _rcpt_DP_colon_STAT3*H /H) : true;
  [_bind_rcpt_DP_stat_28] ((_k28  * _rcpt_DP_colon_STAT3*H * _STAT3_c*H /H) > 0) ->
                          (_k28  * _rcpt_DP_colon_STAT3*H * _STAT3_c*H /H) : true;
  [_unbind_rcpt_DP_stat_28] ((_km28 * _rcpt_DP_colon_STAT3_D*H /H) > 0) ->
                          (_km28 * _rcpt_DP_colon_STAT3_D*H /H) : true;
  [_phospho_stat_rcpt_43] ((_k43 * _rcpt_DP_colon_STAT3_D*H /H) > 0) ->
                          (_k43 * _rcpt_DP_colon_STAT3_D*H /H) : true;
  [_phospho_stat_rcpt_44] ((_k44 * _rcpt_DP_colon_STAT3_DP1*H /H) > 0) ->
                          (_k44 * _rcpt_DP_colon_STAT3_DP1*H /H) : true;
  [_reloc_stat_cn_58] (((0.693 / _k58) * _STAT3_PD_c*H /H) > 0) ->
                          ((0.693 / _k58) * _STAT3_PD_c*H /H) : true;
  [_dephospho_dedimer_stat_59] ((_k59  * _STAT3_PD_n*H /H) > 0) ->
                          (_k59  * _STAT3_PD_n*H /H) : true;
  [_reloc_stat_nc_60] (((0.693 / _k60) * _STAT3_n*H /H) > 0) ->
                          ((0.693 / _k60) * _STAT3_n*H /H) : true;
```

```
  [_synth_socs_61] ((_k61  * _STAT3_PD_n*H /H) > 0) ->
                           (_k61  * _STAT3_PD_n*H /H) : true;
  [_bind_rcpt_DP_socs_62] ((_k62  * _rcpt_DP*H * _SOCS3*H /H) > 0) ->
                           (_k62  * _rcpt_DP*H * _SOCS3*H /H) : true;
  [_unbind_rcpt_DP_socs_62] ((_km62 * _rcpt_DP_colon_SOCS3*H /H) > 0) ->
                           (_km62 * _rcpt_DP_colon_SOCS3*H /H) : true;
  [_bind_rcpt_DP_socs_63] ((_k63  * _rcpt_DP_colon_SOCS3*H * _SOCS3*H /H) > 0) ->
                           (_k63  * _rcpt_DP_colon_SOCS3*H * _SOCS3*H /H) : true;
  [_unbind_rcpt_DP_socs_63] ((_km63 * _rcpt_DP_colon_SOCS3_D*H /H) > 0) ->
                           (_km63 * _rcpt_DP_colon_SOCS3_D*H /H) : true;
  [_bind_pias_stat_80] ((_k80  * _PIAS3*H * _STAT3_PD_n*H /H) > 0) ->
                           (_k80  * _PIAS3*H * _STAT3_PD_n*H /H) : true;
  [_unbind_pias_stat_80] ((_km80 * _PIAS3_colon_STAT3_PD_n*H /H) > 0) ->
                           (_km80 * _PIAS3_colon_STAT3_PD_n*H /H) : true;
  [_degr_socs_81] ((_k81 * _SOCS3*H /H) > 0) ->
                           (_k81 * _SOCS3*H /H) : true;

endmodule


const double H = 300;

const int MAX_rcpt_DP = 1000;
const int MAX_rcpt_DP_colon_STAT3 = func(min,MAX_rcpt_DP,MAX_STAT3_c);
const int MAX_rcpt_DP_colon_STAT3_D = func(min,MAX_rcpt_DP,func(floor,MAX_STAT3_c/2));
const int MAX_rcpt_DP_colon_STAT3_DP1 = MAX_rcpt_DP_colon_STAT3_D;
const int MAX_STAT3_c = 3000;
const int MAX_STAT3_PD_c = func(floor,MAX_STAT3_c/2);
const int MAX_STAT3_PD_n = MAX_STAT3_PD_c;
const int MAX_STAT3_n = MAX_STAT3_c;
const int MAX_SOCS3 = 1000;
const int MAX_rcpt_DP_colon_SOCS3 = func(min,MAX_rcpt_DP,MAX_SOCS3);
const int MAX_rcpt_DP_colon_SOCS3_D = func(min,MAX_rcpt_DP,func(floor,MAX_SOCS3/2));
const int MAX_PIAS3 = 1000;
const int MAX_PIAS3_colon_STAT3_PD_n = func(min,MAX_PIAS3,MAX_STAT3_PD_n);

const int MIN_rcpt_DP = 0;
const int MIN_rcpt_DP_colon_STAT3 = 0;
const int MIN_rcpt_DP_colon_STAT3_D = 0;
const int MIN_rcpt_DP_colon_STAT3_DP1 = 0;
const int MIN_STAT3_c = 0;
const int MIN_STAT3_PD_c = 0;
const int MIN_STAT3_PD_n = 0;
const int MIN_STAT3_n = 0;
const int MIN_SOCS3 = 0;
const int MIN_rcpt_DP_colon_SOCS3 = 0;
const int MIN_rcpt_DP_colon_SOCS3_D = 0;
const int MIN_PIAS3 = 0;
const int MIN_PIAS3_colon_STAT3_PD_n = 0;
```

```
const int N_rcpt_DP = func(floor,MAX_rcpt_DP/H);
const int N_rcpt_DP_colon_STAT3 = func(floor,MAX_rcpt_DP_colon_STAT3/H);
const int N_rcpt_DP_colon_STAT3_D = func(floor,MAX_rcpt_DP_colon_STAT3_D/H);
const int N_rcpt_DP_colon_STAT3_DP1 = func(floor,MAX_rcpt_DP_colon_STAT3_DP1/H);
const int N_STAT3_c = func(floor,MAX_STAT3_c/H);
const int N_STAT3_PD_c = func(floor,MAX_STAT3_PD_c/H);
const int N_STAT3_PD_n = func(floor,MAX_STAT3_PD_n/H);
const int N_STAT3_n = func(floor,MAX_STAT3_n/H);
const int N_SOCS3 = func(floor,MAX_SOCS3/H);
const int N_rcpt_DP_colon_SOCS3 = func(floor,MAX_rcpt_DP_colon_SOCS3/H);
const int N_rcpt_DP_colon_SOCS3_D = func(floor,MAX_rcpt_DP_colon_SOCS3/H);
const int N_PIAS3 = func(floor,MAX_PIAS3/H);
const int N_PIAS3_colon_STAT3_PD_n = func(floor,MAX_PIAS3_colon_STAT3_PD_n/H);

const int NL_rcpt_DP = func(floor,MIN_rcpt_DP/H);
const int NL_rcpt_DP_colon_STAT3 = func(floor,MIN_rcpt_DP_colon_STAT3/H);
const int NL_rcpt_DP_colon_STAT3_D = func(floor,MIN_rcpt_DP_colon_STAT3_D/H);
const int NL_rcpt_DP_colon_STAT3_DP1 = func(floor,MIN_rcpt_DP_colon_STAT3_DP1/H);
const int NL_STAT3_c = func(floor,MIN_STAT3_c/H);
const int NL_STAT3_PD_c = func(floor,MIN_STAT3_PD_c/H);
const int NL_STAT3_PD_n = func(floor,MIN_STAT3_PD_n/H);
const int NL_STAT3_n = func(floor,MIN_STAT3_n/H);
const int NL_SOCS3 = func(floor,MIN_SOCS3/H);
const int NL_rcpt_DP_colon_SOCS3 = func(floor,MIN_rcpt_DP_colon_SOCS3/H);
const int NL_rcpt_DP_colon_SOCS3_D = func(floor,MIN_rcpt_DP_colon_SOCS3/H);
const int NL_PIAS3 = func(floor,MIN_PIAS3/H);
const int NL_PIAS3_colon_STAT3_PD_n = func(floor,MIN_PIAS3_colon_STAT3_PD_n/H);

module _rct_DP

  _rcpt_DP : [NL_rcpt_DP..N_rcpt_DP] init N_rcpt_DP;

  [_bind_rcpt_DP_stat_27] (_rcpt_DP >= 1) -> 1 : (_rcpt_DP' = _rcpt_DP - 1);
  [_unbind_rcpt_DP_stat_27] (_rcpt_DP + 1 <= N_rcpt_DP) -> 1 : (_rcpt_DP' = _rcpt_DP + 1);
  [_phospho_stat_rcpt_44] (_rcpt_DP + 1 <= N_rcpt_DP) -> 1 : (_rcpt_DP' = _rcpt_DP + 1);
  [_bind_rcpt_DP_socs_62] (_rcpt_DP >= 1) -> 1 : (_rcpt_DP' = _rcpt_DP - 1);
  [_unbind_rcpt_DP_socs_62] (_rcpt_DP + 1 <= N_rcpt_DP) -> 1 : (_rcpt_DP' = _rcpt_DP + 1);

endmodule

module _rcpt_DP_colon_STAT3

  _rcpt_DP_colon_STAT3 : [NL_rcpt_DP_colon_STAT3..N_rcpt_DP_colon_STAT3] init 0;

  [_bind_rcpt_DP_stat_27] (_rcpt_DP_colon_STAT3 + 1 <= N_rcpt_DP_colon_STAT3) ->
                          1 : (_rcpt_DP_colon_STAT3' = _rcpt_DP_colon_STAT3 + 1);
  [_unbind_rcpt_DP_stat_27] (_rcpt_DP_colon_STAT3 >= 1) ->
                          1 : (_rcpt_DP_colon_STAT3' = _rcpt_DP_colon_STAT3 - 1);
  [_bind_rcpt_DP_stat_28] (_rcpt_DP_colon_STAT3 >= 1) ->
                          1 : (_rcpt_DP_colon_STAT3' = _rcpt_DP_colon_STAT3 - 1);
```

```
  [_unbind_rcpt_DP_stat_28] (_rcpt_DP_colon_STAT3 + 1 <= N_rcpt_DP_colon_STAT3) ->
                           1 : (_rcpt_DP_colon_STAT3' = _rcpt_DP_colon_STAT3 + 1);

endmodule

module _rcpt_DP_colon_STAT3_D

  _rcpt_DP_colon_STAT3_D : [NL_rcpt_DP_colon_STAT3_D..N_rcpt_DP_colon_STAT3_D] init 0;

  [_bind_rcpt_DP_stat_28] (_rcpt_DP_colon_STAT3_D + 1 <= N_rcpt_DP_colon_STAT3_D) ->
                           1 : (_rcpt_DP_colon_STAT3_D' = _rcpt_DP_colon_STAT3_D + 1);
  [_unbind_rcpt_DP_stat_28] (_rcpt_DP_colon_STAT3_D >= 1) ->
                           1 : (_rcpt_DP_colon_STAT3_D' = _rcpt_DP_colon_STAT3_D - 1);
  [_phospho_stat_rcpt_43] (_rcpt_DP_colon_STAT3_D >= 1) ->
                           1 : (_rcpt_DP_colon_STAT3_D' = _rcpt_DP_colon_STAT3_D - 1);

endmodule

module _rcpt_DP_colon_STAT3_DP1

  _rcpt_DP_colon_STAT3_DP1 : [NL_rcpt_DP_colon_STAT3_DP1..N_rcpt_DP_colon_STAT3_DP1] init 0;

  [_phospho_stat_rcpt_43] (_rcpt_DP_colon_STAT3_DP1 + 1 <= N_rcpt_DP_colon_STAT3_DP1) ->
                           1 : (_rcpt_DP_colon_STAT3_DP1' = _rcpt_DP_colon_STAT3_DP1 + 1);
  [_phospho_stat_rcpt_44] (_rcpt_DP_colon_STAT3_DP1 >= 1) ->
                           1 : (_rcpt_DP_colon_STAT3_DP1' = _rcpt_DP_colon_STAT3_DP1 - 1);

endmodule

module _STAT3_c

  _STAT3_c : [NL_STAT3_c..N_STAT3_c] init N_STAT3_c;

  [_bind_rcpt_DP_stat_27] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_rcpt_DP_stat_27] (_STAT3_c + 1 <= N_STAT3_c) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_bind_rcpt_DP_stat_28] (_STAT3_c >= 1) -> 1 : (_STAT3_c' = _STAT3_c - 1);
  [_unbind_rcpt_DP_stat_28] (_STAT3_c + 1 <= N_STAT3_c) -> 1 : (_STAT3_c' = _STAT3_c + 1);
  [_reloc_stat_nc_60] (_STAT3_c + 1 <= N_STAT3_c) -> 1 : (_STAT3_c' = _STAT3_c + 1);

endmodule

module _STAT3_PD_c

  _STAT3_PD_c : [NL_STAT3_PD_c..N_STAT3_PD_c] init 0;

  [_phospho_stat_rcpt_44] (_STAT3_PD_c + 1 <= N_STAT3_PD_c) -> 1 : (_STAT3_PD_c' = _STAT3_PD_c + 1);
  [_reloc_stat_cn_58] (_STAT3_PD_c >= 1) -> 1 : (_STAT3_PD_c' = _STAT3_PD_c - 1);

endmodule
```

```
module _STAT3_PD_n

  _STAT3_PD_n : [NL_STAT3_PD_n..N_STAT3_PD_n] init 0;

  [_reloc_stat_cn_58] (_STAT3_PD_n + 1 <= N_STAT3_PD_n) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n + 1);
  [_synth_socs_61] (_STAT3_PD_n + 0 <= N_STAT3_PD_n) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n + 0);
  [_dephospho_dedimer_stat_59] (_STAT3_PD_n >= 1) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n - 1);
  [_bind_pias_stat_80] (_STAT3_PD_n >= 1) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n - 1);
  [_unbind_pias_stat_80] (_STAT3_PD_n + 1 <= N_STAT3_PD_n) -> 1 : (_STAT3_PD_n' = _STAT3_PD_n + 1);

endmodule

module _STAT3_n

  _STAT3_n : [NL_STAT3_n..N_STAT3_n] init 0;

  [_dephospho_dedimer_stat_59] (_STAT3_n + 2 <= N_STAT3_n) -> 1 : (_STAT3_n' = _STAT3_n + 2);
  [_reloc_stat_nc_60] (_STAT3_n >= 1) -> 1 : (_STAT3_n' = _STAT3_n - 1);

endmodule

module _SOCS3

  _SOCS3 : [NL_SOCS3..N_SOCS3] init 0;

  [_synth_socs_61] (_SOCS3 + 1 <= N_SOCS3) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_degr_socs_81] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_bind_rcpt_DP_socs_62] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_rcpt_DP_socs_62] (_SOCS3 + 1 <= N_SOCS3) -> 1 : (_SOCS3' = _SOCS3 + 1);
  [_bind_rcpt_DP_socs_63] (_SOCS3 >= 1) -> 1 : (_SOCS3' = _SOCS3 - 1);
  [_unbind_rcpt_DP_socs_63] (_SOCS3 + 1 <= N_SOCS3) -> 1 : (_SOCS3' = _SOCS3 + 1);

endmodule

module _rcpt_DP_colon_SOCS3

  _rcpt_DP_colon_SOCS3 : [NL_rcpt_DP_colon_SOCS3..N_rcpt_DP_colon_SOCS3] init 0;

  [_bind_rcpt_DP_socs_62] (_rcpt_DP_colon_SOCS3 + 1 <= N_rcpt_DP_colon_SOCS3) ->
                          1 : (_rcpt_DP_colon_SOCS3' = _rcpt_DP_colon_SOCS3 + 1);
  [_unbind_rcpt_DP_socs_62] (_rcpt_DP_colon_SOCS3 >= 1) ->
                          1 : (_rcpt_DP_colon_SOCS3' = _rcpt_DP_colon_SOCS3 - 1);
  [_bind_rcpt_DP_socs_63] (_rcpt_DP_colon_SOCS3 >= 1) ->
                          1 : (_rcpt_DP_colon_SOCS3' = _rcpt_DP_colon_SOCS3 - 1);
  [_unbind_rcpt_DP_socs_63] (_rcpt_DP_colon_SOCS3 + 1 <= N_rcpt_DP_colon_SOCS3) ->
                          1 : (_rcpt_DP_colon_SOCS3' = _rcpt_DP_colon_SOCS3 + 1);

endmodule

module _rcpt_DP_colon_SOCS3_D
```

```
  _rcpt_DP_colon_SOCS3_D : [NL_rcpt_DP_colon_SOCS3_D..N_rcpt_DP_colon_SOCS3_D] init 0;

  [_bind_rcpt_DP_socs_63] (_rcpt_DP_colon_SOCS3_D + 1 <= N_rcpt_DP_colon_SOCS3_D) ->
                          1 : (_rcpt_DP_colon_SOCS3_D' = _rcpt_DP_colon_SOCS3_D + 1);
  [_unbind_rcpt_DP_socs_63] (_rcpt_DP_colon_SOCS3_D >= 1) ->
                          1 : (_rcpt_DP_colon_SOCS3_D' = _rcpt_DP_colon_SOCS3_D - 1);

endmodule

module _PIAS3

  _PIAS3 : [NL_PIAS3..N_PIAS3] init N_PIAS3;

  [_bind_pias_stat_80] (_PIAS3 >= 1) -> 1 : (_PIAS3' = _PIAS3 - 1);
  [_unbind_pias_stat_80] (_PIAS3 + 1 <= N_PIAS3) -> 1 : (_PIAS3' = _PIAS3 + 1);

endmodule

module _PIAS3_colon_STAT3_PD_n

  _PIAS3_colon_STAT3_PD_n : [NL_PIAS3_colon_STAT3_PD_n..N_PIAS3_colon_STAT3_PD_n] init 0;

  [_bind_pias_stat_80] (_PIAS3_colon_STAT3_PD_n + 1 <= N_PIAS3_colon_STAT3_PD_n) ->
                          1 : (_PIAS3_colon_STAT3_PD_n' = _PIAS3_colon_STAT3_PD_n + 1);
  [_unbind_pias_stat_80] (_PIAS3_colon_STAT3_PD_n >= 1) ->
                          1 : (_PIAS3_colon_STAT3_PD_n' = _PIAS3_colon_STAT3_PD_n - 1);

endmodule

module _res

  _res : [0..1] init 1;

  [_degr_socs_81] (_res + 0 <= 1) -> 1 : (_res' = _res + 0);

endmodule


// count rewards: "number of occurrences of bind_rcpt_DP_stat_27", rew 1
rewards "_bind_rcpt_DP_stat_27"
  [_bind_rcpt_DP_stat_27] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_rcpt_DP_stat_27", rew 2
rewards "_unbind_rcpt_DP_stat_27"
  [_unbind_rcpt_DP_stat_27] true : 1;
endrewards

// count rewards: "number of occurrences of bind_rcpt_DP_stat_28", rew 3
```

```
rewards "_bind_rcpt_DP_stat_28"
  [_bind_rcpt_DP_stat_28] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_rcpt_DP_stat_28", rew 4
rewards "_unbind_rcpt_DP_stat_28"
  [_unbind_rcpt_DP_stat_28] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_rcpt_43", rew 5
rewards "_phospho_stat_rcpt_43"
  [_phospho_stat_rcpt_43] true : 1;
endrewards

// count rewards: "number of occurrences of phospho_stat_rcpt_44", rew 6
rewards "_phospho_stat_rcpt_44"
  [_phospho_stat_rcpt_44] true : 1;
endrewards

// count rewards: "number of occurrences of reloc_stat_cn_58", rew 7
rewards "_reloc_stat_cn_58"
  [_reloc_stat_cn_58] true : 1;
endrewards

// count rewards: "number of occurrences of dephospho_dedimer_stat_59", rew 8
rewards "_dephospho_dedimer_stat_59"
  [_dephospho_dedimer_stat_59] true : 1;
endrewards

// count rewards: "number of occurrences of reloc_stat_nc_60", rew 9
rewards "_reloc_stat_nc_60"
  [_reloc_stat_nc_60] true : 1;
endrewards

// count rewards: "number of occurrences of synth_socs_61", rew 10
rewards "_synth_socs_61"
  [_synth_socs_61] true : 1;
endrewards

// count rewards: "number of occurrences of bind_rcpt_DP_socs_62", rew 11
rewards "_bind_rcpt_DP_socs_62"
  [_bind_rcpt_DP_socs_62] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_rcpt_DP_socs_62", rew 12
rewards "_unbind_rcpt_DP_socs_62"
  [_unbind_rcpt_DP_socs_62] true : 1;
endrewards

// count rewards: "number of occurrences of bind_rcpt_DP_socs_63", rew 13
```

```
rewards "_bind_rcpt_DP_socs_63"
  [_bind_rcpt_DP_socs_63] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_rcpt_DP_socs_63", rew 14
rewards "_unbind_rcpt_DP_socs_63"
  [_unbind_rcpt_DP_socs_63] true : 1;
endrewards

// count rewards: "number of occurrences of bind_pias_stat_80", rew 15
rewards "_bind_pias_stat_80"
  [_bind_pias_stat_80] true : 1;
endrewards

// count rewards: "number of occurrences of unbind_pias_stat_80", rew 16
rewards "_unbind_pias_stat_80"
  [_unbind_pias_stat_80] true : 1;
endrewards

// count rewards: "number of occurrences of degr_socs_81", rew 17
rewards "_degr_socs_81"
  [_degr_socs_81] true : 1;
endrewards

// rewards: "number of rcpt_DP molecules present", rew 18
rewards "_rcpt_DP"
  true : _rcpt_DP*H;
endrewards

// rewards: "square of number of rcpt_DP molecules present"", rew 19
rewards "_rcpt_DP_squared"
  true : _rcpt_DP*H * _rcpt_DP*H;
endrewards

// rewards: "number of rcpt_DP_colon_STAT3 molecules present", rew 20
rewards "_rcpt_DP_colon_STAT3"
  true : _rcpt_DP_colon_STAT3*H;
endrewards

// rewards: "square of number of rcpt_DP_colon_STAT3 molecules present"", rew 21
rewards "_rcpt_DP_colon_STAT3_squared"
  true : _rcpt_DP_colon_STAT3*H * _rcpt_DP_colon_STAT3*H;
endrewards

// rewards: "number of rcpt_DP_colon_STAT3_D molecules present", rew 22
rewards "_rcpt_DP_colon_STAT3_D"
  true : _rcpt_DP_colon_STAT3_D*H;
endrewards

// rewards: "square of number of rcpt_DP_colon_STAT3_D molecules present"", rew 23
```

```
rewards "_rcpt_DP_colon_STAT3_D_squared"
  true : _rcpt_DP_colon_STAT3_D*H * _rcpt_DP_colon_STAT3_D*H;
endrewards

// rewards: "number of rcpt_DP_colon_STAT3_DP1 molecules present", rew 24
rewards "_rcpt_DP_colon_STAT3_DP1"
  true : _rcpt_DP_colon_STAT3_DP1*H;
endrewards

// rewards: "square of number of rcpt_DP_colon_STAT3_DP1 molecules present"", rew 25
rewards "_rcpt_DP_colon_STAT3_DP1_squared"
  true : _rcpt_DP_colon_STAT3_DP1*H * _rcpt_DP_colon_STAT3_DP1*H;
endrewards

// rewards: "number of STAT3_c molecules present", rew 26
rewards "_STAT3_c"
  true : _STAT3_c*H;
endrewards

// rewards: "square of number of STAT3_c molecules present"", rew 27
rewards "_STAT3_c_squared"
  true : _STAT3_c*H * _STAT3_c*H;
endrewards

// rewards: "number of STAT3_PD_c molecules present", rew 28
rewards "_STAT3_PD_c"
  true : _STAT3_PD_c*H;
endrewards

// rewards: "square of number of STAT3_PD_c molecules present"", rew 29
rewards "_STAT3_PD_c_squared"
  true : _STAT3_PD_c*H * _STAT3_PD_c*H;
endrewards

// rewards: "number of STAT3_PD_n molecules present", rew 30
rewards "_STAT3_PD_n"
  true : _STAT3_PD_n*H;
endrewards

// rewards: "square of number of STAT3_PD_n molecules present"", rew 31
rewards "_STAT3_PD_n_squared"
  true : _STAT3_PD_n*H * _STAT3_PD_n*H;
endrewards

// rewards: "number of STAT3_n molecules present", rew 32
rewards "_STAT3_n"
  true : _STAT3_n*H;
endrewards

// rewards: "square of number of STAT3_n molecules present"", rew 33
```

```
rewards "_STAT3_n_squared"
  true : _STAT3_n*H * _STAT3_n*H;
endrewards

// rewards: "number of SOCS3 molecules present", rew 34
rewards "_SOCS3"
  true : _SOCS3*H;
endrewards

// rewards: "square of number of SOCS3 molecules present"", rew 35
rewards "_SOCS3_squared"
  true : _SOCS3*H * _SOCS3*H;
endrewards

// rewards: "number of rcpt_DP_colon_SOCS3 molecules present", rew 36
rewards "_rcpt_DP_colon_SOCS3"
  true : _rcpt_DP_colon_SOCS3*H;
endrewards

// rewards: "square of number of rcpt_DP_colon_SOCS3 molecules present"", rew 37
rewards "_rcpt_DP_colon_SOCS3_squared"
  true : _rcpt_DP_colon_SOCS3*H * _rcpt_DP_colon_SOCS3*H;
endrewards

// rewards: "number of rcpt_DP_colon_SOCS3_D molecules present", rew 38
rewards "_rcpt_DP_colon_SOCS3_D"
  true : _rcpt_DP_colon_SOCS3_D*H;
endrewards

// rewards: "square of number of rcpt_DP_colon_SOCS3_D molecules present"", rew 39
rewards "_rcpt_DP_colon_SOCS3_D_squared"
  true : _rcpt_DP_colon_SOCS3_D*H * _rcpt_DP_colon_SOCS3_D*H;
endrewards

// rewards: "number of PIAS3 molecules present", rew 40
rewards "_PIAS3"
  true : _PIAS3*H;
endrewards

// rewards: "square of number of PIAS3 molecules present"", rew 41
rewards "_PIAS3_squared"
  true : _PIAS3*H * _PIAS3*H;
endrewards

// rewards: "number of PIAS3:STAT3_PD_n molecules present", rew 42
rewards "_PIAS3_colon_STAT3_PD_n"
  true : _PIAS3_colon_STAT3_PD_n*H;
endrewards

// rewards: "square of number of PIAS3:STAT3_PD_n molecules present"", rew 43
```

```
rewards "_PIAS3_colon_STAT3_PD_n_squared"
  true : _PIAS3_colon_STAT3_PD_n*H * _PIAS3_colon_STAT3_PD_n*H;
endrewards


// End PRISM model compiled from _gp130_STAT_exp_all
```