

MACHINE**ErbB0****SEES****C0****VARIABLES**

EGF
 EGFR
 EGFEGR
 EGFEGRdim
 EGFEGR0dim
 EGFEGR0dimGAPGrbdim
 EGFEGR0dimGAPGrbdimProt
 EGFEGRi0dimGAPGrbdim
 Prot
 Proti
 EGFRi
 EGFEGRi0dim
 GAP
 EGFEGR0dimGAP
 EGFEGRi0dimGAP
 EGF_i
 EGFEGR_i
 EGFEGR_idim
 EGFEGR_i0
 Grbdim
 Sos
 EGFEGR0dimGAPGrbdimSos
 RasGDP
 EGFEGR0dimGAPGrbdimSosRasGDP
 RasGTP
 EGFEGR0dimGAPGrbdimSosRasGTP
 RasGTP0
 EGFEGR0dimGAPShc
 Shc
 EGFEGR0dimGAPShc0
 EGFEGR0dimGAPShc0Grbdim
 EGFEGR0dimGAPShc0GrbdimSos
 EGFEGR0dimGAPShc0GrbdimSosRasGDP
 Raf
 RafRasGTP
 Raf0
 EGFEGR0dimGAPShc0GrbdimSosRasGTP
 Shc0GrbdimSos
 GrbdimSos
 Shc0
 Shc0Grbdim
 Phosphatase1
 Raf0Phosphatase1
 MEK
 MEKRaf0
 MEKP
 MEKPRaf0
 MEKPP
 Phosphatase2
 MEKPPPphosphatase2
 MEKPPphosphatase2
 ERK
 ERKMEKPP
 ERKP
 ERKPPMEKPP
 ERKPP

Phosphatase3
 ERKPPPPhosphatase3
 ERKPPPhosphatase3
 EGFRideg
 EGFideg
 EGFEGFRi0dimdeg
 EGFEGFRi0dimGAPGrbdimSos
 EGFEGFRi0dimGAPGrbdimSosRasGDP
 RasGTPi
 RasGTPi0
 EGFEGFRi0dimGAPGrbdimSosRasGTPi
 EGFEGFRi0dimGAPGrbdimSosRasGTP
 EGFEGFRi0dimGAPShc
 EGFEGFRi0dimGAPShc0
 EGFEGFRi0dimGAPShc0Grbdim
 EGFEGFRi0dimGAPShc0GrbdimSos
 EGFEGFRi0dimGAPShc0GrbdimSosRasGDP
 RafRasGTPi
 Rafi0
 EGFEGFRi0dimGAPShc0GrbdimSosRasGTP
 ShcGrbdimSos
 Rafi0Phosphatase1
 MEKRafi0
 MEKiP
 MEKPRafi0
 MEKiPP
 MEKiPPPPhosphatase2
 MEKiPPPhosphatase2
 ERKMEKiPP
 ERKiP
 ERKiPMEKiPP
 ERKiPP
 ERKiPPPPhosphatase3
 ERKiPPPhosphatase3
 EGFEGFR0dimGAPGrbdimSosProt
 EGFEGFR0dimGAPGrbdimSosRasGDPProt
 EGFEGFR0dimGAPGrbdimSosRasGTPProt
 EGFEGFR0dimGAPShc0GrbdimProt
 EGFEGFR0dimGAPShc0GrbdimSosProt
 EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt
 EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt
 EGFEGFR0dimGAPGrbdimSosERKPP
 EGFEGFRi0dimGAPGrbdimSosERKiPP
 EGFEGFR0dimGAPShc0GrbdimSosERKPP
 EGFEGFRi0dimGAPShc0GrbdimSosERKiPP
 SosERKPP
 SosERKiPP
 EGFEGFRi0dimGAPGrbdimSosERKPP
 EGFEGFRi0dimGAPGrbdimSosdeg
 EGFEGFRi0dimGAPShc0GrbdimSosERKPP
 EGFEGFRi0dimGAPShc0GrbdimSosdeg
 Sosi
 SosERKPPi
 ERKPPi

INVARIANTS

inv1 : $EGF \in \mathbb{N}$
 inv2 : $EGFR \in \mathbb{N}$
 inv3 : $EGFEGFR \in \mathbb{N}$
 inv4 : $EGFEGFRdim \in \mathbb{N}$
 inv5 : $EGFEGFR0dim \in \mathbb{N}$
 inv6 : $EGFEGFR0dimGAPGrbdim \in \mathbb{N}$
 inv7 : $EGFEGFR0dimGAPGrbdimProt \in \mathbb{N}$

inv8 : EGFEGRi0dimGAPGrbdim $\in \mathbb{N}$
 inv9 : Prot $\in \mathbb{N}$
 inv10 : Proti $\in \mathbb{N}$
 inv11 : EGFRi $\in \mathbb{N}$
 inv12 : EGFEGRi0dim $\in \mathbb{N}$
 inv13 : GAP $\in \mathbb{N}$
 inv14 : EGFEGR0dimGAP $\in \mathbb{N}$
 inv15 : EGFEGRi0dimGAP $\in \mathbb{N}$
 inv16 : EGFi $\in \mathbb{N}$
 inv17 : EGFEGRi $\in \mathbb{N}$
 inv18 : EGFEGRidim $\in \mathbb{N}$
 inv19 : EGFEGRi0 $\in \mathbb{N}$
 inv20 : Grbdim $\in \mathbb{N}$
 inv21 : Sos $\in \mathbb{N}$
 inv22 : EGFEGR0dimGAPGrbdimSos $\in \mathbb{N}$
 inv23 : RasGDP $\in \mathbb{N}$
 inv24 : EGFEGR0dimGAPGrbdimSosRasGDP $\in \mathbb{N}$
 inv25 : RasGTP $\in \mathbb{N}$
 inv26 : EGFEGR0dimGAPGrbdimSosRasGTP $\in \mathbb{N}$
 inv27 : RasGTP0 $\in \mathbb{N}$
 inv28 : EGFEGR0dimGAPShc $\in \mathbb{N}$
 inv29 : Shc $\in \mathbb{N}$
 inv30 : EGFEGR0dimGAPShc0 $\in \mathbb{N}$
 inv31 : EGFEGR0dimGAPShc0Grbdim $\in \mathbb{N}$
 inv32 : EGFEGR0dimGAPShc0GrbdimSos $\in \mathbb{N}$
 inv33 : EGFEGR0dimGAPShc0GrbdimSosRasGDP $\in \mathbb{N}$
 inv34 : Raf $\in \mathbb{N}$
 inv35 : RafRasGTP $\in \mathbb{N}$
 inv36 : Raf0 $\in \mathbb{N}$
 inv37 : EGFEGR0dimGAPShc0GrbdimSosRasGTP $\in \mathbb{N}$
 inv38 : Shc0GrbdimSos $\in \mathbb{N}$
 inv39 : GrbdimSos $\in \mathbb{N}$
 inv40 : Shc0 $\in \mathbb{N}$
 inv41 : Shc0Grbdim $\in \mathbb{N}$
 inv42 : Phosphatase1 $\in \mathbb{N}$
 inv43 : Raf0Phosphatase1 $\in \mathbb{N}$
 inv44 : MEK $\in \mathbb{N}$
 inv45 : MEKRaf0 $\in \mathbb{N}$
 inv46 : MEKP $\in \mathbb{N}$
 inv47 : MEKPRaf0 $\in \mathbb{N}$
 inv48 : MEKPP $\in \mathbb{N}$
 inv49 : Phosphatase2 $\in \mathbb{N}$
 inv50 : MEKPPPPhosphatase2 $\in \mathbb{N}$
 inv51 : MEKPPPhosphatase2 $\in \mathbb{N}$
 inv52 : ERK $\in \mathbb{N}$
 inv53 : ERKMEKPP $\in \mathbb{N}$
 inv54 : ERKP $\in \mathbb{N}$
 inv55 : ERKPMKPP $\in \mathbb{N}$
 inv56 : ERKPP $\in \mathbb{N}$
 inv57 : Phosphatase3 $\in \mathbb{N}$
 inv58 : ERKPPPPhosphatase3 $\in \mathbb{N}$
 inv59 : ERKPPPhosphatase3 $\in \mathbb{N}$
 inv60 : EGFRideg $\in \mathbb{N}$
 inv61 : EGFideg $\in \mathbb{N}$
 inv62 : EGFEGRi0dimdeg $\in \mathbb{N}$
 inv63 : EGFEGRi0dimGAPGrbdimSos $\in \mathbb{N}$
 inv64 : EGFEGRi0dimGAPGrbdimSosRasGDP $\in \mathbb{N}$
 inv65 : RasGTPi $\in \mathbb{N}$
 inv66 : RasGTPi0 $\in \mathbb{N}$
 inv67 : EGFEGRi0dimGAPGrbdimSosRasGTPi $\in \mathbb{N}$
 inv68 : EGFEGRi0dimGAPGrbdimSosRasGTP $\in \mathbb{N}$
 inv69 : EGFEGRi0dimGAPShc $\in \mathbb{N}$

inv70 : EGFEGFRi0dimGAPShc0 ∈ ℕ
 inv71 : EGFEGFRi0dimGAPShc0Grbdim ∈ ℕ
 inv72 : EGFEGFRi0dimGAPShc0GrbdimSos ∈ ℕ
 inv73 : EGFEGFRi0dimGAPShc0GrbdimSosRasGDP ∈ ℕ
 inv74 : RafRasGTPi ∈ ℕ
 inv75 : Rafi0 ∈ ℕ
 inv76 : EGFEGFRi0dimGAPShc0GrbdimSosRasGTP ∈ ℕ
 inv77 : ShcGrbdimSos ∈ ℕ
 inv78 : Rafi0Phosphatase1 ∈ ℕ
 inv79 : MEKRafi0 ∈ ℕ
 inv80 : MEKiP ∈ ℕ
 inv81 : MEKPRafi0 ∈ ℕ
 inv82 : MEKiPP ∈ ℕ
 inv83 : MEKiPPPPhosphatase2 ∈ ℕ
 inv84 : MEKiPPPhosphatase2 ∈ ℕ
 inv85 : ERKMEKiPP ∈ ℕ
 inv86 : ERKiP ∈ ℕ
 inv87 : ERKiPMEKiPP ∈ ℕ
 inv88 : ERKiPP ∈ ℕ
 inv89 : ERKiPPPPhosphatase3 ∈ ℕ
 inv90 : ERKiPPPhosphatase3 ∈ ℕ
 inv91 : EGFEGFR0dimGAPGrbdimSosProt ∈ ℕ
 inv92 : EGFEGFR0dimGAPGrbdimSosRasGDPProt ∈ ℕ
 inv93 : EGFEGFR0dimGAPGrbdimSosRasGTPProt ∈ ℕ
 inv94 : EGFEGFR0dimGAPShc0GrbdimProt ∈ ℕ
 inv95 : EGFEGFR0dimGAPShc0GrbdimSosProt ∈ ℕ
 inv96 : EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt ∈ ℕ
 inv97 : EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt ∈ ℕ
 inv98 : EGFEGFR0dimGAPGrbdimSosERKPP ∈ ℕ
 inv99 : EGFEGFRi0dimGAPGrbdimSosERKiPP ∈ ℕ
 inv100 : EGFEGFR0dimGAPShc0GrbdimSosERKPP ∈ ℕ
 inv101 : EGFEGFRi0dimGAPShc0GrbdimSosERKiPP ∈ ℕ
 inv102 : SosERKPP ∈ ℕ
 inv103 : SosERKiPP ∈ ℕ
 inv104 : EGFEGFRi0dimGAPGrbdimSosERKPP ∈ ℕ
 inv105 : EGFEGFRi0dimGAPGrbdimSosdeg ∈ ℕ
 inv106 : EGFEGFRi0dimGAPShc0GrbdimSosERKPP ∈ ℕ
 inv107 : EGFEGFRi0dimGAPShc0GrbdimSosdeg ∈ ℕ
 inv108 : Sosi ∈ ℕ
 inv109 : SosERKPPi ∈ ℕ
 inv110 : ERKPPi ∈ ℕ

EVENTS

INITIALISATION \triangleq

STATUS

ordinary

BEGIN

act1 : EGF := 0
 act2 : EGFR := 0
 act3 : EGFEGFR := 0
 act4 : EGFEGFRdim := 0
 act5 : EGFEGFR0dim := 0
 act6 : EGFEGFR0dimGAPGrbdim := 0
 act7 : EGFEGFR0dimGAPGrbdimProt := 0
 act8 : EGFEGFRi0dimGAPGrbdim := 0
 act9 : Prot := 0
 act10 : Proti := 0
 act11 : EGFRi := 0
 act12 : EGFEGFRi0dim := 0
 act13 : GAP := 0
 act14 : EGFEGFR0dimGAP := 0
 act15 : EGFEGFRi0dimGAP := 0
 act16 : EGFi := 0

act17 : EGFEGRi := 0
act18 : EGFEGRidim := 0
act19 : EGFEGRi0 := 0
act20 : Grbdim := 0
act21 : Sos := 0
act22 : EGFEGR0dimGAPGrbdimSos := 0
act23 : RasGDP := 0
act24 : EGFEGR0dimGAPGrbdimSosRasGDP := 0
act25 : RasGTP := 0
act26 : EGFEGR0dimGAPGrbdimSosRasGTP := 0
act27 : RasGTP0 := 0
act28 : EGFEGR0dimGAPShc := 0
act29 : Shc := 0
act30 : EGFEGR0dimGAPShc0 := 0
act31 : EGFEGR0dimGAPShc0Grbdim := 0
act32 : EGFEGR0dimGAPShc0GrbdimSos := 0
act33 : EGFEGR0dimGAPShc0GrbdimSosRasGDP := 0
act34 : Raf := 0
act35 : RafRasGTP := 0
act36 : Raf0 := 0
act37 : EGFEGR0dimGAPShc0GrbdimSosRasGTP := 0
act38 : Shc0GrbdimSos := 0
act39 : GrbdimSos := 0
act40 : Shc0 := 0
act41 : Shc0Grbdim := 0
act42 : Phosphatase1 := 0
act43 : Raf0Phosphatase1 := 0
act44 : MEK := 0
act45 : MEKRaf0 := 0
act46 : MEKP := 0
act47 : MEKPRaf0 := 0
act48 : MEKPP := 0
act49 : Phosphatase2 := 0
act50 : MEKPPPhosphatase2 := 0
act51 : MEKPPPhosphatase2 := 0
act52 : ERK := 0
act53 : ERKMEKPP := 0
act54 : ERKP := 0
act55 : ERKPMKPP := 0
act56 : ERKPP := 0
act57 : Phosphatase3 := 0
act58 : ERKPPPhosphatase3 := 0
act59 : ERKPPPhosphatase3 := 0
act60 : EGFRideg := 0
act61 : EGFi deg := 0
act62 : EGFEGRi0dimdeg := 0
act63 : EGFEGRi0dimGAPGrbdimSos := 0
act64 : EGFEGRi0dimGAPGrbdimSosRasGDP := 0
act65 : RasGTPi := 0
act66 : RasGTPi0 := 0
act67 : EGFEGRi0dimGAPGrbdimSosRasGTPi := 0
act68 : EGFEGRi0dimGAPGrbdimSosRasGTP := 0
act69 : EGFEGRi0dimGAPShc := 0
act70 : EGFEGRi0dimGAPShc0 := 0
act71 : EGFEGRi0dimGAPShc0Grbdim := 0
act72 : EGFEGRi0dimGAPShc0GrbdimSos := 0
act73 : EGFEGRi0dimGAPShc0GrbdimSosRasGDP := 0
act74 : RafRasGTPi := 0
act75 : Rafi0 := 0
act76 : EGFEGRi0dimGAPShc0GrbdimSosRasGTP := 0
act77 : ShcGrbdimSos := 0
act78 : Rafi0Phosphatase1 := 0

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act79 : MEKRaf0 := 0
act80 : MEKiP := 0
act81 : MEKPRaf0 := 0
act82 : MEKiPP := 0
act83 : MEKiPPPPhosphatase2 := 0
act84 : MEKiPPPhosphatase2 := 0
act85 : ERKMEKiPP := 0
act86 : ERKiP := 0
act87 : ERKiPMEKiPP := 0
act88 : ERKiPP := 0
act89 : ERKiPPPPhosphatase3 := 0
act90 : ERKiPPPhosphatase3 := 0
act91 : EGFEGFR0dimGAPGrbdimSosProt := 0
act92 : EGFEGFR0dimGAPGrbdimSosRasGDPProt := 0
act93 : EGFEGFR0dimGAPGrbdimSosRasGTPProt := 0
act94 : EGFEGFR0dimGAPShc0GrbdimProt := 0
act95 : EGFEGFR0dimGAPShc0GrbdimSosProt := 0
act96 : EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt := 0
act97 : EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt := 0
act98 : EGFEGFR0dimGAPGrbdimSosERKPP := 0
act99 : EGFEGFRi0dimGAPGrbdimSosERKiPP := 0
act100 : EGFEGFR0dimGAPShc0GrbdimSosERKPP := 0
act101 : EGFEGFRi0dimGAPShc0GrbdimSosERKiPP := 0
act102 : SosERKPP := 0
act103 : SosERKiPP := 0
act104 : EGFEGFRi0dimGAPGrbdimSosERKPP := 0
act105 : EGFEGFRi0dimGAPGrbdimSosdeg := 0
act106 : EGFEGFRi0dimGAPShc0GrbdimSosERKPP := 0
act107 : EGFEGFRi0dimGAPShc0GrbdimSosdeg := 0
act108 : Sosi := 0
act109 : SosERKPPi := 0
act110 : ERKPPi := 0

```

END

Rec1f \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFR \geq 1 \wedge EGF \geq 1$

THEN

act1 : $EGFR := EGFR - 1$

act2 : $EGF := EGF - 1$

act3 : $EGFEGFR := EGFEGFR + 1$

END

Rec1r \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFR \geq 1$

THEN

act1 : $EGFEGFR := EGFEGFR - 1$

act2 : $EGFR := EGFR + 1$

act3 : $EGF := EGF + 1$

END

Rec2f \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFR \geq 2$

THEN

act1 : EGFEGFR := EGFEGFR - 2
act2 : EGFEGFRdim := EGFEGFRdim + 1
END

Rec2r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRdim \geq 1

THEN

act1 : EGFEGFRdim := EGFEGFRdim - 1

act2 : EGFEGFR := EGFEGFR + 2

END

Rec3f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRdim \geq 1

THEN

act1 : EGFEGFRdim := EGFEGFRdim - 1

act2 : EGFEGFR0dim := EGFEGFR0dim + 1

END

Rec3r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dim \geq 1

THEN

act1 : EGFEGFR0dim := EGFEGFR0dim - 1

act2 : EGFEGFRdim := EGFEGFRdim + 1

END

Rec4f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdim \geq 1 \wedge Prot \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdim := EGFEGFR0dimGAPGrbdim - 1

act2 : Prot := Prot - 1

act3 : EGFEGFR0dimGAPGrbdimProt := EGFEGFR0dimGAPGrbdimProt + 1

END

Rec4r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimProt \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdimProt := EGFEGFR0dimGAPGrbdimProt - 1

act2 : EGFEGFR0dimGAPGrbdim := EGFEGFR0dimGAPGrbdim + 1

act3 : Prot := Prot + 1

END

Rec5f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimProt \geq 1

THEN

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act1 : EGFEGFR0dimGAPGrbdimProt := EGFEGFR0dimGAPGrbdimProt - 1
act2 : EGFEGFRi0dimGAPGrbdim := EGFEGFRi0dimGAPGrbdim + 1
act3 : Proti := Proti + 1

```

END

Rec6f \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFR \geq 1$

THEN

act1 : $EGFR := EGFR - 1$

act2 : $EGFRi := EGFRi + 1$

END

Rec6r \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFRi \geq 1$

THEN

act1 : $EGFRi := EGFRi - 1$

act2 : $EGFR := EGFR + 1$

END

Rec7f \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFR0dim \geq 1$

THEN

act1 : $EGFEGFR0dim := EGFEGFR0dim - 1$

act2 : $EGFEGFRi0dim := EGFEGFRi0dim + 1$

END

Rec8f \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFR0dim \geq 1 \wedge GAP \geq 1$

THEN

act1 : $EGFEGFR0dim := EGFEGFR0dim - 1$

act2 : $GAP := GAP - 1$

act3 : $EGFEGFR0dimGAP := EGFEGFR0dimGAP + 1$

END

Rec8r \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFR0dimGAP \geq 1$

THEN

act1 : $EGFEGFR0dimGAP := EGFEGFR0dimGAP - 1$

act2 : $EGFEGFR0dim := EGFEGFR0dim + 1$

act3 : $GAP := GAP + 1$

END

Rec9f \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFR0dimGAP \geq 1$

THEN
 act1 : $\text{EGFEGFR0dimGAP} := \text{EGFEGFR0dimGAP} - 1$
 act2 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} + 1$
END

Rec10f \triangleq

STATUS

ordinary

WHEN

grd1 : $\text{EGFRi} \geq 1 \wedge \text{EGFi} \geq 1$

THEN

act1 : $\text{EGFRi} := \text{EGFRi} - 1$

act2 : $\text{EGFi} := \text{EGFi} - 1$

act3 : $\text{EGFEGFRi} := \text{EGFEGFRi} + 1$

END

Rec10r \triangleq

STATUS

ordinary

WHEN

grd1 : $\text{EGFEGFRi} \geq 1$

THEN

act1 : $\text{EGFEGFRi} := \text{EGFEGFRi} - 1$

act2 : $\text{EGFRi} := \text{EGFRi} + 1$

act3 : $\text{EGFi} := \text{EGFi} + 1$

END

Rec11f \triangleq

STATUS

ordinary

WHEN

grd1 : $\text{EGFEGFRi} \geq 2$

THEN

act1 : $\text{EGFEGFRi} := \text{EGFEGFRi} - 2$

act2 : $\text{EGFEGFRidim} := \text{EGFEGFRidim} + 1$

END

Rec11r \triangleq

STATUS

ordinary

WHEN

grd1 : $\text{EGFEGFRidim} \geq 1$

THEN

act1 : $\text{EGFEGFRidim} := \text{EGFEGFRidim} - 1$

act2 : $\text{EGFEGFRi} := \text{EGFEGFRi} + 1$

END

Rec12f \triangleq

STATUS

ordinary

WHEN

grd1 : $\text{EGFEGFRidim} \geq 1$

THEN

act1 : $\text{EGFEGFRidim} := \text{EGFEGFRidim} - 1$

act2 : $\text{EGFEGFRi0dim} := \text{EGFEGFRi0dim} + 1$

END

Rec12r \triangleq

STATUS

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dim} \geq 1$

```

THEN
  act1 : EGFEGFRi0dim := EGFEGFRi0dim - 1
  act2 : EGFEGFRidim := EGFEGFRidim + 1
END

```

Rec13f \triangleq

STATUS

ordinary

BEGIN

act1 : EGFR := EGFR + 1

END

Rec14f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dim \geq 1 \wedge GAP \geq 1

THEN

act1 : EGFEGFRi0dim := EGFEGFRi0dim - 1

act2 : GAP := GAP - 1

act3 : EGFEGFRi0dimGAP := EGFEGFRi0dimGAP + 1

END

Rec14r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dimGAP \geq 1

THEN

act1 : EGFEGFRi0dimGAP := EGFEGFRi0dimGAP - 1

act2 : EGFEGFRi0 := EGFEGFRi0 + 1

act3 : GAP := GAP + 1

END

Rec15f \triangleq

STATUS

ordinary

WHEN

grd1 : Proti \geq 1

THEN

act1 : Proti := Proti - 1

act2 : Prot := Prot + 1

END

Rec16f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAP \geq 1 \wedge Grbdim \geq 1

THEN

act1 : EGFEGFR0dimGAP := EGFEGFR0dimGAP - 1

act2 : Grbdim := Grbdim - 1

act3 : EGFEGFR0dimGAPGrbdim := EGFEGFR0dimGAPGrbdim + 1

END

Rec16r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdim \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdim := EGFEGFR0dimGAPGrbdim - 1

act2 : EGFEGFR0dimGAP := EGFEGFR0dimGAP + 1
 act3 : Grbdim := Grbdim + 1

END

Rec17f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdim $\geq 1 \wedge$ Sos ≥ 1

THEN

act1 : EGFEGFR0dimGAPGrbdim := EGFEGFR0dimGAPGrbdim - 1
 act2 : Sos := Sos - 1
 act3 : EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos + 1

END

Rec17r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSos ≥ 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos - 1
 act2 : EGFEGFR0dimGAPGrbdim := EGFEGFR0dimGAPGrbdim + 1
 act3 : Sos := Sos + 1

END

Rec18f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSos $\geq 1 \wedge$ RasGDP ≥ 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos - 1
 act2 : RasGDP := RasGDP - 1
 act3 : EGFEGFR0dimGAPGrbdimSosRasGDP := EGFEGFR0dimGAPGrbdimSosRasGDP + 1

END

Rec18r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSosRasGDP ≥ 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSosRasGDP := EGFEGFR0dimGAPGrbdimSosRasGDP - 1
 act2 : EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos + 1
 act3 : RasGDP := RasGDP + 1

END

Rec19f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSosRasGDP ≥ 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSosRasGDP := EGFEGFR0dimGAPGrbdimSosRasGDP - 1
 act2 : EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos + 1
 act3 : RasGTP := RasGTP + 1

END

Rec19r \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFR0dimGAPGrbdimSos \geq 1 \wedge RasGTP \geq 1$

THEN

act1 : $EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos - 1$

act2 : $RasGTP := RasGTP - 1$

act3 : $EGFEGFR0dimGAPGrbdimSosRasGDP := EGFEGFR0dimGAPGrbdimSosRasGDP + 1$

END**Rec20f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $RasGTP0 \geq 1 \wedge EGFEGFR0dimGAPGrbdimSos \geq 1$

THEN

act1 : $RasGTP0 := RasGTP0 - 1$

act2 : $EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos - 1$

act3 : $EGFEGFR0dimGAPGrbdimSosRasGTP := EGFEGFR0dimGAPGrbdimSosRasGTP + 1$

END**Rec20r** \triangleq **STATUS**

ordinary

WHEN

grd1 : $EGFEGFR0dimGAPGrbdimSosRasGTP \geq 1$

THEN

act1 : $EGFEGFR0dimGAPGrbdimSosRasGTP := EGFEGFR0dimGAPGrbdimSosRasGTP - 1$

act2 : $RasGTP0 := RasGTP0 + 1$

act3 : $EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos + 1$

END**Rec21f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $EGFEGFR0dimGAPGrbdimSosRasGTP \geq 1$

THEN

act1 : $EGFEGFR0dimGAPGrbdimSosRasGTP := EGFEGFR0dimGAPGrbdimSosRasGTP - 1$

act2 : $EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos + 1$

act3 : $RasGDP := RasGDP + 1$

END**Rec21r** \triangleq **STATUS**

ordinary

WHEN

grd1 : $EGFEGFR0dimGAPGrbdimSos \geq 1 \wedge RasGDP \geq 1$

THEN

act1 : $EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos - 1$

act2 : $RasGDP := RasGDP - 1$

act3 : $EGFEGFR0dimGAPGrbdimSosRasGDP := EGFEGFR0dimGAPGrbdimSosRasGDP + 1$

END**Rec22f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $EGFEGFR0dimGAP \geq 1 \wedge Shc \geq 1$

THEN

act1 : $EGFEGFR0dimGAP := EGFEGFR0dimGAP - 1$

act2 : $Shc := Shc - 1$

act3 : $EGFEGFR0dimGAPShc := EGFEGFR0dimGAPShc + 1$

END

Rec22r \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc} := \text{EGFEGFR0dimGAPShc} - 1$ act2 : $\text{EGFEGFR0dimGAP} := \text{EGFEGFR0dimGAP} + 1$ act3 : $\text{Shc} := \text{Shc} + 1$ **END****Rec23f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc} := \text{EGFEGFR0dimGAPShc} - 1$ act2 : $\text{EGFEGFR0dimGAPShc0} := \text{EGFEGFR0dimGAPShc0} + 1$ **END****Rec23r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0} := \text{EGFEGFR0dimGAPShc0} - 1$ act2 : $\text{EGFEGFR0dimGAPShc} := \text{EGFEGFR0dimGAPShc} + 1$ **END****Rec24f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0} \geq 1 \wedge \text{Grbdim} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0} := \text{EGFEGFR0dimGAPShc0} - 1$ act2 : $\text{Grbdim} := \text{Grbdim} - 1$ act3 : $\text{EGFEGFR0dimGAPShc0Grbdim} := \text{EGFEGFR0dimGAPShc0Grbdim} + 1$ **END****Rec24r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0Grbdim} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0Grbdim} := \text{EGFEGFR0dimGAPShc0Grbdim} - 1$ act2 : $\text{EGFEGFR0dimGAPShc0} := \text{EGFEGFR0dimGAPShc0} + 1$ act3 : $\text{Grbdim} := \text{Grbdim} + 1$ **END****Rec25f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0Grbdim} \geq 1 \wedge \text{Sos} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0Grbdim} := \text{EGFEGFR0dimGAPShc0Grbdim} - 1$ act2 : $\text{Sos} := \text{Sos} - 1$

act3 : EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos + 1
END

Rec25r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0GrbdimSos \geq 1

THEN

act1 : EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos - 1

act2 : EGFEGFR0dimGAPShc0Grbdim := EGFEGFR0dimGAPShc0Grbdim + 1

act3 : Sos := Sos + 1

END

Rec26f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0GrbdimSos \geq 1 \wedge RasGDP \geq 1

THEN

act1 : EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos - 1

act2 : RasGDP := RasGDP - 1

act3 : EGFEGFR0dimGAPShc0GrbdimSosRasGDP := EGFEGFR0dimGAPShc0GrbdimSosRasGDP + 1

END

Rec26r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0GrbdimSosRasGDP \geq 1

THEN

act1 : EGFEGFR0dimGAPShc0GrbdimSosRasGDP := EGFEGFR0dimGAPShc0GrbdimSosRasGDP - 1

act2 : EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos + 1

act3 : RasGDP := RasGDP + 1

END

Rec27f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0GrbdimSosRasGDP \geq 1

THEN

act1 : EGFEGFR0dimGAPShc0GrbdimSosRasGDP := EGFEGFR0dimGAPShc0GrbdimSosRasGDP - 1

act2 : EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos + 1

act3 : RasGTP := RasGTP + 1

END

Rec27r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0GrbdimSos \geq 1 \wedge RasGTP \geq 1

THEN

act1 : EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos - 1

act2 : RasGTP := RasGTP - 1

act3 : EGFEGFR0dimGAPShc0GrbdimSosRasGDP := EGFEGFR0dimGAPShc0GrbdimSosRasGDP + 1

END

Rec28f \triangleq

STATUS

ordinary

WHEN

```

    grd1 : Raf ≥ 1 ∧ RasGTP ≥ 1
  THEN
    act1 : Raf := Raf - 1
    act2 : RasGTP := RasGTP - 1
    act3 : RafRasGTP := RafRasGTP + 1
  END

```

Rec28r \triangleq

STATUS

ordinary

WHEN

grd1 : RafRasGTP ≥ 1

THEN

act1 : RafRasGTP := RafRasGTP - 1

act2 : Raf := Raf + 1

act3 : RasGTP := RasGTP + 1

END

Rec29f \triangleq

STATUS

ordinary

WHEN

grd1 : RafRasGTP ≥ 1

THEN

act1 : RafRasGTP := RafRasGTP - 1

act2 : Raf0 := Raf0 + 1

act3 : RasGTP0 := RasGTP0 + 1

END

Rec29r \triangleq

STATUS

ordinary

WHEN

grd1 : Raf0 ≥ 1 ∧ RasGTP0 ≥ 1

THEN

act1 : Raf0 := Raf0 - 1

act2 : RasGTP0 := RasGTP0 - 1

act3 : RafRasGTP := RafRasGTP + 1

END

Rec30f \triangleq

STATUS

ordinary

WHEN

grd1 : RasGTP0 ≥ 1 ∧ EGFEGR0dimGAPShc0GrbdimSos ≥ 1

THEN

act1 : RasGTP0 := RasGTP0 - 1

act2 : EGFEGR0dimGAPShc0GrbdimSos := EGFEGR0dimGAPShc0GrbdimSos - 1

act3 : EGFEGR0dimGAPShc0GrbdimSosRasGTP := EGFEGR0dimGAPShc0GrbdimSosRasGTP + 1

END

Rec30r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGR0dimGAPShc0GrbdimSosRasGTP ≥ 1

THEN

act1 : EGFEGR0dimGAPShc0GrbdimSosRasGTP := EGFEGR0dimGAPShc0GrbdimSosRasGTP - 1

act2 : RasGTP0 := RasGTP0 + 1

act3 : EGFEGR0dimGAPShc0GrbdimSos := EGFEGR0dimGAPShc0GrbdimSos + 1

END

Rec31f \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} - 1$ act2 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} := \text{EGFEGFR0dimGAPShc0GrbdimSos} + 1$ act3 : $\text{RasGDP} := \text{RasGDP} + 1$ **END****Rec31r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} \geq 1 \wedge \text{RasGDP} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} := \text{EGFEGFR0dimGAPShc0GrbdimSos} - 1$ act2 : $\text{RasGDP} := \text{RasGDP} - 1$ act3 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} + 1$ **END****Rec32f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} := \text{EGFEGFR0dimGAPShc0GrbdimSos} - 1$ act2 : $\text{EGFEGFR0dimGAP} := \text{EGFEGFR0dimGAP} + 1$ act3 : $\text{Shc0GrbdimSos} := \text{Shc0GrbdimSos} + 1$ **END****Rec32r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAP} \geq 1 \wedge \text{Shc0GrbdimSos} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAP} := \text{EGFEGFR0dimGAP} - 1$ act2 : $\text{Shc0GrbdimSos} := \text{Shc0GrbdimSos} - 1$ act3 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} := \text{EGFEGFR0dimGAPShc0GrbdimSos} + 1$ **END****Rec33f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{Shc0GrbdimSos} \geq 1$ **THEN**act1 : $\text{Shc0GrbdimSos} := \text{Shc0GrbdimSos} - 1$ act2 : $\text{GrbdimSos} := \text{GrbdimSos} + 1$ act3 : $\text{Shc0} := \text{Shc0} + 1$ **END****Rec33r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{GrbdimSos} \geq 1 \wedge \text{Shc0} \geq 1$ **THEN**act1 : $\text{GrbdimSos} := \text{GrbdimSos} - 1$


```

act2 : Shc0 := Shc0 - 1
act3 : Shc0GrbdimSos := Shc0GrbdimSos + 1
END

```

Rec34f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSos \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos - 1

act2 : EGFEGFR0dimGAP := EGFEGFR0dimGAP + 1

act3 : GrbdimSos := GrbdimSos + 1

END

Rec34r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAP \geq 1 \wedge GrbdimSos \geq 1

THEN

act1 : EGFEGFR0dimGAP := EGFEGFR0dimGAP - 1

act2 : GrbdimSos := GrbdimSos - 1

act3 : EGFEGFR0dimGAPGrbdimSos := EGFEGFR0dimGAPGrbdimSos + 1

END

Rec35f \triangleq

STATUS

ordinary

WHEN

grd1 : GrbdimSos \geq 1

THEN

act1 : GrbdimSos := GrbdimSos - 1

act2 : Grbdim := Grbdim + 1

act3 : Sos := Sos + 1

END

Rec35r \triangleq

STATUS

ordinary

WHEN

grd1 : Grbdim \geq 1 \wedge Sos \geq 1

THEN

act1 : Grbdim := Grbdim - 1

act2 : Sos := Sos - 1

act3 : GrbdimSos := GrbdimSos + 1

END

Rec36f \triangleq

STATUS

ordinary

WHEN

grd1 : Shc0 \geq 1

THEN

act1 : Shc0 := Shc0 - 1

act2 : Shc := Shc + 1

END

Rec36r \triangleq

STATUS

ordinary

WHEN

```

    grd1 : Shc ≥ 1
THEN
    act1 : Shc := Shc - 1
    act2 : Shc0 := Shc0 + 1
END

```

Rec37f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0 ≥ 1

THEN

act1 : EGFEGFR0dimGAPShc0 := EGFEGFR0dimGAPShc0 - 1

act2 : EGFEGFR0dimGAP := EGFEGFR0dimGAP + 1

act3 : Shc0 := Shc0 + 1

END

Rec37r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAP ≥ 1 \wedge Shc0 ≥ 1

THEN

act1 : EGFEGFR0dimGAP := EGFEGFR0dimGAP - 1

act2 : Shc0 := Shc0 - 1

act3 : EGFEGFR0dimGAPShc0 := EGFEGFR0dimGAPShc0 + 1

END

Rec38f \triangleq

STATUS

ordinary

WHEN

grd1 : Shc0 ≥ 1 \wedge Grbdim ≥ 1

THEN

act1 : Shc0 := Shc0 - 1

act2 : Grbdim := Grbdim - 1

act3 : Shc0Grbdim := Shc0Grbdim + 1

END

Rec38r \triangleq

STATUS

ordinary

WHEN

grd1 : Shc0Grbdim ≥ 1

THEN

act1 : Shc0Grbdim := Shc0Grbdim - 1

act2 : Shc0 := Shc0 + 1

act3 : Grbdim := Grbdim + 1

END

Rec39f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0Grbdim ≥ 1

THEN

act1 : EGFEGFR0dimGAPShc0Grbdim := EGFEGFR0dimGAPShc0Grbdim - 1

act2 : EGFEGFR0dimGAP := EGFEGFR0dimGAP + 1

act3 : Shc0Grbdim := Shc0Grbdim + 1

END

Rec39r \triangleq

STATUS**ordinary****WHEN**grd1 : $EGFEGFR0dimGAP \geq 1 \wedge Shc0Grbdim \geq 1$ **THEN**act1 : $EGFEGFR0dimGAP := EGFEGFR0dimGAP - 1$ act2 : $Shc0Grbdim := Shc0Grbdim - 1$ act3 : $EGFEGFR0dimGAPShc0Grbdim := EGFEGFR0dimGAPShc0Grbdim + 1$ **END****Rec40f** \triangleq **STATUS****ordinary****WHEN**grd1 : $Shc0Grbdim \geq 1 \wedge Sos \geq 1$ **THEN**act1 : $Shc0Grbdim := Shc0Grbdim - 1$ act2 : $Sos := Sos - 1$ act3 : $Shc0GrbdimSos := Shc0GrbdimSos + 1$ **END****Rec40r** \triangleq **STATUS****ordinary****WHEN**grd1 : $Shc0GrbdimSos \geq 1$ **THEN**act1 : $Shc0GrbdimSos := Shc0GrbdimSos - 1$ act2 : $Shc0Grbdim := Shc0Grbdim + 1$ act3 : $Sos := Sos + 1$ **END****Rec41f** \triangleq **STATUS****ordinary****WHEN**grd1 : $EGFEGFR0dimGAPShc0 \geq 1 \wedge GrbdimSos \geq 1$ **THEN**act1 : $EGFEGFR0dimGAPShc0 := EGFEGFR0dimGAPShc0 - 1$ act2 : $GrbdimSos := GrbdimSos - 1$ act3 : $EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos + 1$ **END****Rec41r** \triangleq **STATUS****ordinary****WHEN**grd1 : $EGFEGFR0dimGAPShc0GrbdimSos \geq 1$ **THEN**act1 : $EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos - 1$ act2 : $EGFEGFR0dimGAPShc0 := EGFEGFR0dimGAPShc0 + 1$ act3 : $GrbdimSos := GrbdimSos + 1$ **END****Rec42f** \triangleq **STATUS****ordinary****WHEN**grd1 : $Raf0 \geq 1 \wedge Phosphatase1 \geq 1$ **THEN**act1 : $Raf0 := Raf0 - 1$ act2 : $Phosphatase1 := Phosphatase1 - 1$

act3 : Raf0Phosphatase1 := Raf0Phosphatase1 + 1
END

Rec42r \triangleq

STATUS

ordinary

WHEN

grd1 : Raf0Phosphatase1 \geq 1

THEN

act1 : Raf0Phosphatase1 := Raf0Phosphatase1 - 1

act2 : Raf0 := Raf0 + 1

act3 : Phosphatase1 := Phosphatase1 + 1

END

Rec43f \triangleq

STATUS

ordinary

WHEN

grd1 : Raf0Phosphatase1 \geq 1

THEN

act1 : Raf0Phosphatase1 := Raf0Phosphatase1 - 1

act2 : Raf := Raf + 1

act3 : Phosphatase1 := Phosphatase1 + 1

END

Rec44f \triangleq

STATUS

ordinary

WHEN

grd1 : MEK \geq 1 \wedge Raf0 \geq 1

THEN

act1 : MEK := MEK - 1

act2 : Raf0 := Raf0 - 1

act3 : MEKRaf0 := MEKRaf0 + 1

END

Rec44r \triangleq

STATUS

ordinary

WHEN

grd1 : MEKRaf0 \geq 1

THEN

act1 : MEKRaf0 := MEKRaf0 - 1

act2 : MEK := MEK + 1

act3 : Raf0 := Raf0 + 1

END

Rec45f \triangleq

STATUS

ordinary

WHEN

grd1 : MEKRaf0 \geq 1

THEN

act1 : MEKRaf0 := MEKRaf0 - 1

act2 : MEKP := MEKP + 1

act3 : Raf0 := Raf0 + 1

END

Rec46f \triangleq

STATUS

ordinary

WHEN

```

    grd1 : MEKP ≥ 1 ∧ Raf0 ≥ 1
THEN
    act1 : MEKP := MEKP - 1
    act2 : Raf0 := Raf0 - 1
    act3 : MEKPRaf0 := MEKPRaf0 + 1
END

```

Rec46r \triangleq

STATUS

ordinary

WHEN

grd1 : MEKPRaf0 ≥ 1

THEN

act1 : MEKPRaf0 := MEKPRaf0 - 1

act2 : MEKP := MEKP + 1

act3 : Raf0 := Raf0 + 1

END

Rec47f \triangleq

STATUS

ordinary

WHEN

grd1 : MEKPRaf0 ≥ 1

THEN

act1 : MEKPRaf0 := MEKPRaf0 - 1

act2 : MEKPP := MEKPP + 1

act3 : Raf0 := Raf0 + 1

END

Rec48f \triangleq

STATUS

ordinary

WHEN

grd1 : MEKPP ≥ 1 ∧ Phosphatase2 ≥ 1

THEN

act1 : MEKPP := MEKPP - 1

act2 : Phosphatase2 := Phosphatase2 - 1

act3 : MEKPPPhosphatase2 := MEKPPPhosphatase2 + 1

END

Rec48r \triangleq

STATUS

ordinary

WHEN

grd1 : MEKPPPhosphatase2 ≥ 1

THEN

act1 : MEKPPPhosphatase2 := MEKPPPhosphatase2 - 1

act2 : MEKPP := MEKPP + 1

act3 : Phosphatase2 := Phosphatase2 + 1

END

Rec49f \triangleq

STATUS

ordinary

WHEN

grd1 : MEKPPPhosphatase2 ≥ 1

THEN

act1 : MEKPPPhosphatase2 := MEKPPPhosphatase2 - 1

act2 : MEKP := MEKP + 1

act3 : Phosphatase2 := Phosphatase2 + 1

END

Rec50f \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{MEKP} \geq 1 \wedge \text{Phosphatase2} \geq 1$ **THEN**act1 : $\text{MEKP} := \text{MEKP} - 1$ act2 : $\text{Phosphatase2} := \text{Phosphatase2} - 1$ act3 : $\text{MEKPPPhosphatase2} := \text{MEKPPPhosphatase2} + 1$ **END****Rec50r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{MEKPPPhosphatase2} \geq 1$ **THEN**act1 : $\text{MEKPPPhosphatase2} := \text{MEKPPPhosphatase2} - 1$ act2 : $\text{MEKP} := \text{MEKP} + 1$ act3 : $\text{Phosphatase2} := \text{Phosphatase2} + 1$ **END****Rec51f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{MEKPPPhosphatase2} \geq 1$ **THEN**act1 : $\text{MEKPPPhosphatase2} := \text{MEKPPPhosphatase2} - 1$ act2 : $\text{MEK} := \text{MEK} + 1$ act3 : $\text{Phosphatase2} := \text{Phosphatase2} + 1$ **END****Rec52f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{ERK} \geq 1 \wedge \text{MEKPP} \geq 1$ **THEN**act1 : $\text{ERK} := \text{ERK} - 1$ act2 : $\text{MEKPP} := \text{MEKPP} - 1$ act3 : $\text{ERKMEKPP} := \text{ERKMEKPP} + 1$ **END****Rec52r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{ERKMEKPP} \geq 1$ **THEN**act1 : $\text{ERKMEKPP} := \text{ERKMEKPP} - 1$ act2 : $\text{ERK} := \text{ERK} + 1$ act3 : $\text{MEKPP} := \text{MEKPP} + 1$ **END****Rec53f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{ERKMEKPP} \geq 1$ **THEN**act1 : $\text{ERKMEKPP} := \text{ERKMEKPP} - 1$

act2 : ERKP := ERKP + 1
 act3 : MEKPP := MEKPP + 1
END

Rec54f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKP \geq 1 \wedge MEKPP \geq 1

THEN

act1 : ERKP := ERKP - 1
 act2 : MEKPP := MEKPP - 1
 act3 : ERKPMEKPP := ERKPMEKPP + 1

END

Rec54r \triangleq

STATUS

ordinary

WHEN

grd1 : ERKPMEKPP \geq 1

THEN

act1 : ERKPMEKPP := ERKPMEKPP - 1
 act2 : ERKP := ERKP + 1
 act3 : MEKPP := MEKPP + 1

END

Rec55f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKPMEKPP \geq 1

THEN

act1 : ERKPMEKPP := ERKPMEKPP - 1
 act2 : ERKPP := ERKPP + 1
 act3 : MEKPP := MEKPP + 1

END

Rec56f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKPP \geq 1 \wedge Phosphatase3 \geq 1

THEN

act1 : ERKPP := ERKPP - 1
 act2 : Phosphatase3 := Phosphatase3 - 1
 act3 : ERKPPPhosphatase3 := ERKPPPhosphatase3 + 1

END

Rec56r \triangleq

STATUS

ordinary

WHEN

grd1 : ERKPPPhosphatase3 \geq 1

THEN

act1 : ERKPPPhosphatase3 := ERKPPPhosphatase3 - 1
 act2 : ERKPP := ERKPP + 1
 act3 : Phosphatase3 := Phosphatase3 + 1

END

Rec57f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKPPPphosphatase3 \geq 1

THEN

act1 : ERKPPPphosphatase3 := ERKPPPphosphatase3 - 1

act2 : ERKP := ERKP + 1

act3 : Phosphatase3 := Phosphatase3 + 1

END**Rec58f** \triangleq **STATUS**

ordinary

WHEN

grd1 : ERKP \geq 1 \wedge Phosphatase3 \geq 1

THEN

act1 : ERKP := ERKP - 1

act2 : Phosphatase3 := Phosphatase3 - 1

act3 : ERKPPPphosphatase3 := ERKPPPphosphatase3 + 1

END**Rec58r** \triangleq **STATUS**

ordinary

WHEN

grd1 : ERKPPPphosphatase3 \geq 1

THEN

act1 : ERKPPPphosphatase3 := ERKPPPphosphatase3 - 1

act2 : ERKP := ERKP + 1

act3 : Phosphatase3 := Phosphatase3 + 1

END**Rec59f** \triangleq **STATUS**

ordinary

WHEN

grd1 : ERKPPPphosphatase3 \geq 1

THEN

act1 : ERKPPPphosphatase3 := ERKPPPphosphatase3 - 1

act2 : ERK := ERK + 1

act3 : Phosphatase3 := Phosphatase3 + 1

END**Rec60f** \triangleq **STATUS**

ordinary

WHEN

grd1 : EGFRi \geq 1

THEN

act1 : EGFRi := EGFRi - 1

act2 : EGFRideg := EGFRideg + 1

END**Rec61f** \triangleq **STATUS**

ordinary

WHEN

grd1 : EGFi \geq 1

THEN

act1 : EGFi := EGFi - 1

act2 : EGFideg := EGFideg + 1

END**Rec62f** \triangleq

STATUS**ordinary****WHEN**grd1 : $EGFEGFRi0dim \geq 1$ **THEN**act1 : $EGFEGFRi0dim := EGFEGFRi0dim - 1$ act2 : $EGFEGFRi0dimdeg := EGFEGFRi0dimdeg + 1$ **END****Rec63f** \triangleq **STATUS****ordinary****WHEN**grd1 : $EGFEGFRi0dimGAP \geq 1 \wedge Grbdim \geq 1$ **THEN**act1 : $EGFEGFRi0dimGAP := EGFEGFRi0dimGAP - 1$ act2 : $Grbdim := Grbdim - 1$ act3 : $EGFEGFRi0dimGAPGrbdim := EGFEGFRi0dimGAPGrbdim + 1$ **END****Rec63r** \triangleq **STATUS****ordinary****WHEN**grd1 : $EGFEGFRi0dimGAPGrbdim \geq 1$ **THEN**act1 : $EGFEGFRi0dimGAPGrbdim := EGFEGFRi0dimGAPGrbdim - 1$ act2 : $EGFEGFRi0dimGAP := EGFEGFRi0dimGAP + 1$ act3 : $Grbdim := Grbdim + 1$ **END****Rec64f** \triangleq **STATUS****ordinary****WHEN**grd1 : $EGFEGFRi0dimGAPGrbdim \geq 1 \wedge Sos \geq 1$ **THEN**act1 : $EGFEGFRi0dimGAPGrbdim := EGFEGFRi0dimGAPGrbdim - 1$ act2 : $Sos := Sos - 1$ act3 : $EGFEGFRi0dimGAPGrbdimSos := EGFEGFRi0dimGAPGrbdimSos + 1$ **END****Rec64r** \triangleq **STATUS****ordinary****WHEN**grd1 : $EGFEGFRi0dimGAPGrbdimSos \geq 1$ **THEN**act1 : $EGFEGFRi0dimGAPGrbdimSos := EGFEGFRi0dimGAPGrbdimSos - 1$ act2 : $EGFEGFRi0dimGAPGrbdim := EGFEGFRi0dimGAPGrbdim + 1$ act3 : $Sos := Sos + 1$ **END****Rec65f** \triangleq **STATUS****ordinary****WHEN**grd1 : $EGFEGFRi0dimGAPGrbdimSos \geq 1 \wedge RasGDP \geq 1$ **THEN**act1 : $EGFEGFRi0dimGAPGrbdimSos := EGFEGFRi0dimGAPGrbdimSos - 1$ act2 : $RasGDP := RasGDP - 1$ act3 : $EGFEGFRi0dimGAPGrbdimSosRasGDP := EGFEGFRi0dimGAPGrbdimSosRasGDP + 1$

END**Rec65r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGDP} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPGrbdimSosRasGDP} - 1$ act2 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} + 1$ act3 : $\text{RasGDP} := \text{RasGDP} + 1$ **END****Rec66f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGDP} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPGrbdimSosRasGDP} - 1$ act2 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} + 1$ act3 : $\text{RasGTPi} := \text{RasGTPi} + 1$ **END****Rec66r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdimSos} \geq 1 \wedge \text{RasGTPi} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} - 1$ act2 : $\text{RasGTPi} := \text{RasGTPi} - 1$ act3 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPGrbdimSosRasGDP} + 1$ **END****Rec67f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{RasGTPi0} \geq 1 \wedge \text{EGFEGFRi0dimGAPGrbdimSos} \geq 1$ **THEN**act1 : $\text{RasGTPi0} := \text{RasGTPi0} - 1$ act2 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} - 1$ act3 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGTPi} := \text{EGFEGFRi0dimGAPGrbdimSosRasGTPi} + 1$ **END****Rec67r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGTPi} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGTPi} := \text{EGFEGFRi0dimGAPGrbdimSosRasGTPi} - 1$ act2 : $\text{RasGTPi0} := \text{RasGTPi0} + 1$ act3 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} + 1$ **END****Rec68f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGTP} \geq 1$

THEN

act1 : EGFEGFRi0dimGAPGrbdimSosRasGTP := EGFEGFRi0dimGAPGrbdimSosRasGTP - 1

act2 : EGFEGFRi0dimGAPGrbdimSos := EGFEGFRi0dimGAPGrbdimSos + 1

act3 : RasGDP := RasGDP + 1

END**Rec68r** \triangleq **STATUS**

ordinary

WHENgrd1 : EGFEGFRi0dimGAPGrbdimSos \geq 1 \wedge RasGDP \geq 1**THEN**

act1 : EGFEGFRi0dimGAPGrbdimSos := EGFEGFRi0dimGAPGrbdimSos - 1

act2 : RasGDP := RasGDP - 1

act3 : EGFEGFRi0dimGAPGrbdimSosRasGTP := EGFEGFRi0dimGAPGrbdimSosRasGTP + 1

END**Rec69f** \triangleq **STATUS**

ordinary

WHENgrd1 : EGFEGFRi0dimGAP \geq 1 \wedge Shc \geq 1**THEN**

act1 : EGFEGFRi0dimGAP := EGFEGFRi0dimGAP - 1

act2 : Shc := Shc - 1

act3 : EGFEGFRi0dimGAPShc := EGFEGFRi0dimGAPShc + 1

END**Rec69r** \triangleq **STATUS**

ordinary

WHENgrd1 : EGFEGFRi0dimGAPShc \geq 1**THEN**

act1 : EGFEGFRi0dimGAPShc := EGFEGFRi0dimGAPShc - 1

act2 : EGFEGFRi0dimGAP := EGFEGFRi0dimGAP + 1

act3 : Shc := Shc + 1

END**Rec70f** \triangleq **STATUS**

ordinary

WHENgrd1 : EGFEGFR0dimGAPShc \geq 1**THEN**

act1 : EGFEGFR0dimGAPShc := EGFEGFR0dimGAPShc - 1

act2 : EGFEGFR0dimGAPShc0 := EGFEGFR0dimGAPShc0 + 1

END**Rec70r** \triangleq **STATUS**

ordinary

WHENgrd1 : EGFEGFR0dimGAPShc0 \geq 1**THEN**

act1 : EGFEGFR0dimGAPShc0 := EGFEGFR0dimGAPShc0 - 1

act2 : EGFEGFR0dimGAPShc := EGFEGFR0dimGAPShc + 1

END**Rec71f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0} \geq 1 \wedge \text{Grbdim} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0} := \text{EGFEGFRi0dimGAPShc0} - 1$

act2 : $\text{Grbdim} := \text{Grbdim} - 1$

act3 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} + 1$

END**Rec71r** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0Grbdim} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} - 1$

act2 : $\text{EGFEGFRi0dimGAPShc0} := \text{EGFEGFRi0dimGAPShc0} + 1$

act3 : $\text{Grbdim} := \text{Grbdim} + 1$

END**Rec72f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0Grbdim} \geq 1 \wedge \text{Sos} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} - 1$

act2 : $\text{Sos} := \text{Sos} - 1$

act3 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} + 1$

END**Rec72r** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} - 1$

act2 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} + 1$

act3 : $\text{Sos} := \text{Sos} + 1$

END**Rec73f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} \geq 1 \wedge \text{RasGDP} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} - 1$

act2 : $\text{RasGDP} := \text{RasGDP} - 1$

act3 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} + 1$

END**Rec73r** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} - 1$

act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} + 1$

act3 : $\text{RasGDP} := \text{RasGDP} + 1$

END

Rec74f \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} + 1$ act3 : $\text{RasGTPi} := \text{RasGTPi} + 1$ **END****Rec74r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} \geq 1 \wedge \text{RasGTPi} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} - 1$ act2 : $\text{RasGTPi} := \text{RasGTPi} - 1$ act3 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} + 1$ **END****Rec75f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{Raf} \geq 1 \wedge \text{RasGTPi} \geq 1$ **THEN**act1 : $\text{Raf} := \text{Raf} - 1$ act2 : $\text{RasGTPi} := \text{RasGTPi} - 1$ act3 : $\text{RafRasGTPi} := \text{RafRasGTPi} + 1$ **END****Rec75r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{RafRasGTPi} \geq 1$ **THEN**act1 : $\text{RafRasGTPi} := \text{RafRasGTPi} - 1$ act2 : $\text{Raf} := \text{Raf} + 1$ act3 : $\text{RasGTPi} := \text{RasGTPi} + 1$ **END****Rec76f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{RafRasGTPi} \geq 1$ **THEN**act1 : $\text{RafRasGTPi} := \text{RafRasGTPi} - 1$ act2 : $\text{Rafi0} := \text{Rafi0} + 1$ act3 : $\text{RasGTPi0} := \text{RasGTPi0} + 1$ **END****Rec76r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{Rafi0} \geq 1 \wedge \text{RasGTPi0} \geq 1$ **THEN**

act1 : Rafi0 := Rafi0 - 1
 act2 : RasGTPi0 := RasGTPi0 - 1
 act3 : RafRasGTPi := RafRasGTPi + 1
END

Rec77f \triangleq

STATUS

ordinary

WHEN

grd1 : RasGTPi0 \geq 1 \wedge EGFEGFRi0dimGAPShc0GrbdimSos \geq 1

THEN

act1 : RasGTPi0 := RasGTPi0 - 1
 act2 : EGFEGFRi0dimGAPShc0GrbdimSos := EGFEGFRi0dimGAPShc0GrbdimSos - 1
 act3 : EGFEGFRi0dimGAPShc0GrbdimSosRasGTP := EGFEGFRi0dimGAPShc0GrbdimSosRasGTP + 1

END

Rec77r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dimGAPShc0GrbdimSosRasGTP \geq 1

THEN

act1 : EGFEGFRi0dimGAPShc0GrbdimSosRasGTP := EGFEGFRi0dimGAPShc0GrbdimSosRasGTP - 1
 act2 : RasGTPi0 := RasGTPi0 + 1
 act3 : EGFEGFRi0dimGAPShc0GrbdimSos := EGFEGFRi0dimGAPShc0GrbdimSos + 1

END

Rec78f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dimGAPShc0GrbdimSosRasGTP \geq 1

THEN

act1 : EGFEGFRi0dimGAPShc0GrbdimSosRasGTP := EGFEGFRi0dimGAPShc0GrbdimSosRasGTP - 1
 act2 : EGFEGFRi0dimGAPShc0GrbdimSos := EGFEGFRi0dimGAPShc0GrbdimSos + 1
 act3 : RasGDP := RasGDP + 1

END

Rec78r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dimGAPShc0GrbdimSos \geq 1 \wedge RasGDP \geq 1

THEN

act1 : EGFEGFRi0dimGAPShc0GrbdimSos := EGFEGFRi0dimGAPShc0GrbdimSos - 1
 act2 : RasGDP := RasGDP - 1
 act3 : EGFEGFRi0dimGAPShc0GrbdimSosRasGDP := EGFEGFRi0dimGAPShc0GrbdimSosRasGDP + 1

END

Rec79f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dimGAPShc0GrbdimSos \geq 1

THEN

act1 : EGFEGFRi0dimGAPShc0GrbdimSos := EGFEGFRi0dimGAPShc0GrbdimSos - 1
 act2 : EGFEGFRi0dimGAP := EGFEGFRi0dimGAP + 1
 act3 : ShcGrbdimSos := ShcGrbdimSos + 1

END

Rec79r \triangleq

STATUS

ordinary
WHEN
 grd1 : $\text{EGFEGFRi0dimGAP} \geq 1 \wedge \text{ShcGrbdimSos} \geq 1$
THEN
 act1 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} - 1$
 act2 : $\text{ShcGrbdimSos} := \text{ShcGrbdimSos} - 1$
 act3 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} + 1$
END

Rec80f \triangleq
STATUS
ordinary
WHEN
 grd1 : $\text{EGFEGFRi0dimGAPGrbdimSos} \geq 1$
THEN
 act1 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} - 1$
 act2 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} + 1$
 act3 : $\text{GrbdimSos} := \text{GrbdimSos} + 1$
END

Rec80r \triangleq
STATUS
ordinary
WHEN
 grd1 : $\text{EGFEGFRi0dimGAP} \geq 1 \wedge \text{GrbdimSos} \geq 1$
THEN
 act1 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} - 1$
 act2 : $\text{GrbdimSos} := \text{GrbdimSos} - 1$
 act3 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} + 1$
END

Rec81f \triangleq
STATUS
ordinary
WHEN
 grd1 : $\text{EGFEGFRi0dimGAPShc0} \geq 1$
THEN
 act1 : $\text{EGFEGFRi0dimGAPShc0} := \text{EGFEGFRi0dimGAPShc0} - 1$
 act2 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} + 1$
 act3 : $\text{Shc0} := \text{Shc0} + 1$
END

Rec81r \triangleq
STATUS
ordinary
WHEN
 grd1 : $\text{EGFEGFRi0dimGAP} \geq 1 \wedge \text{Shc0} \geq 1$
THEN
 act1 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} - 1$
 act2 : $\text{Shc0} := \text{Shc0} - 1$
 act3 : $\text{EGFEGFRi0dimGAPShc0} := \text{EGFEGFRi0dimGAPShc0} + 1$
END

Rec82f \triangleq
STATUS
ordinary
WHEN
 grd1 : $\text{EGFEGFRi0dimGAPShc0Grbdim} \geq 1$
THEN
 act1 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} - 1$
 act2 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} + 1$
 act3 : $\text{Shc0Grbdim} := \text{Shc0Grbdim} + 1$

END**Rec82r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAP} \geq 1 \wedge \text{Shc0Grbdim} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} - 1$ act2 : $\text{Shc0Grbdim} := \text{Shc0Grbdim} - 1$ act3 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} + 1$ **END****Rec83f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPShc0} \geq 1 \wedge \text{GrbdimSos} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPShc0} := \text{EGFEGFRi0dimGAPShc0} - 1$ act2 : $\text{GrbdimSos} := \text{GrbdimSos} - 1$ act3 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} + 1$ **END****Rec83r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0} := \text{EGFEGFRi0dimGAPShc0} + 1$ act3 : $\text{GrbdimSos} := \text{GrbdimSos} + 1$ **END****Rec84f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{Rafi0} \geq 1 \wedge \text{Phosphatase1} \geq 1$ **THEN**act1 : $\text{Rafi0} := \text{Rafi0} - 1$ act2 : $\text{Phosphatase1} := \text{Phosphatase1} - 1$ act3 : $\text{Rafi0Phosphatase1} := \text{Rafi0Phosphatase1} + 1$ **END****Rec84r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{Rafi0Phosphatase1} \geq 1$ **THEN**act1 : $\text{Rafi0Phosphatase1} := \text{Rafi0Phosphatase1} - 1$ act2 : $\text{Rafi0} := \text{Rafi0} + 1$ act3 : $\text{Phosphatase1} := \text{Phosphatase1} + 1$ **END****Rec85f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{Rafi0Phosphatase1} \geq 1$

THEN
 act1 : Rafi0Phosphatase1 := Rafi0Phosphatase1 - 1
 act2 : Raf := Raf + 1
 act3 : Phosphatase1 := Phosphatase1 + 1
END

Rec86f \triangleq

STATUS

ordinary

WHEN

grd1 : $MEK \geq 1 \wedge Rafi0 \geq 1$

THEN

act1 : $MEK := MEK - 1$

act2 : $Rafi0 := Rafi0 - 1$

act3 : $MEKRafi0 := MEKRafi0 + 1$

END

Rec86r \triangleq

STATUS

ordinary

WHEN

grd1 : $MEKRafi0 \geq 1$

THEN

act1 : $MEKRafi0 := MEKRafi0 - 1$

act2 : $MEK := MEK + 1$

act3 : $Rafi0 := Rafi0 + 1$

END

Rec87f \triangleq

STATUS

ordinary

WHEN

grd1 : $MEKRafi0 \geq 1$

THEN

act1 : $MEKRafi0 := MEKRafi0 - 1$

act2 : $MEKiP := MEKiP + 1$

act3 : $Rafi0 := Rafi0 + 1$

END

Rec88f \triangleq

STATUS

ordinary

WHEN

grd1 : $MEKiP \geq 1 \wedge Rafi0 \geq 1$

THEN

act1 : $MEKiP := MEKiP - 1$

act2 : $Rafi0 := Rafi0 - 1$

act3 : $MEKPRafi0 := MEKPRafi0 + 1$

END

Rec88r \triangleq

STATUS

ordinary

WHEN

grd1 : $MEKPRafi0 \geq 1$

THEN

act1 : $MEKPRafi0 := MEKPRafi0 - 1$

act2 : $MEKiP := MEKiP + 1$

act3 : $Rafi0 := Rafi0 + 1$

END

Rec89f \triangleq

STATUS**ordinary****WHEN**grd1 : $\text{MEKPRafi0} \geq 1$ **THEN**act1 : $\text{MEKPRafi0} := \text{MEKPRafi0} - 1$ act2 : $\text{MEKiPP} := \text{MEKiPP} + 1$ act3 : $\text{Rafi0} := \text{Rafi0} + 1$ **END****Rec90f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{MEKiPP} \geq 1 \wedge \text{Phosphatase2} \geq 1$ **THEN**act1 : $\text{MEKiPP} := \text{MEKiPP} - 1$ act2 : $\text{Phosphatase2} := \text{Phosphatase2} - 1$ act3 : $\text{MEKiPPPPhosphatase2} := \text{MEKiPPPPhosphatase2} + 1$ **END****Rec90r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{MEKiPPPPhosphatase2} \geq 1$ **THEN**act1 : $\text{MEKiPPPPhosphatase2} := \text{MEKiPPPPhosphatase2} - 1$ act2 : $\text{MEKiPP} := \text{MEKiPP} + 1$ act3 : $\text{Phosphatase2} := \text{Phosphatase2} + 1$ **END****Rec91f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{MEKiPPPPhosphatase2} \geq 1$ **THEN**act1 : $\text{MEKiPPPPhosphatase2} := \text{MEKiPPPPhosphatase2} - 1$ act2 : $\text{MEKiP} := \text{MEKiP} + 1$ act3 : $\text{Phosphatase2} := \text{Phosphatase2} + 1$ **END****Rec92f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{MEKiP} \geq 1 \wedge \text{Phosphatase2} \geq 1$ **THEN**act1 : $\text{MEKiP} := \text{MEKiP} - 1$ act2 : $\text{Phosphatase2} := \text{Phosphatase2} - 1$ act3 : $\text{MEKiPPhosphatase2} := \text{MEKiPPhosphatase2} + 1$ **END****Rec92r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{MEKiPPhosphatase2} \geq 1$ **THEN**act1 : $\text{MEKiPPhosphatase2} := \text{MEKiPPhosphatase2} - 1$ act2 : $\text{MEKiP} := \text{MEKiP} + 1$

act3 : Phosphatase2 := Phosphatase2 + 1

END

Rec93f \triangleq

STATUS

ordinary

WHEN

grd1 : MEKiPPhosphatase2 \geq 1

THEN

act1 : MEKiPPhosphatase2 := MEKiPPhosphatase2 - 1

act2 : MEK := MEK + 1

act3 : Phosphatase2 := Phosphatase2 + 1

END

Rec94f \triangleq

STATUS

ordinary

WHEN

grd1 : ERK \geq 1 \wedge MEKiPP \geq 1

THEN

act1 : ERK := ERK - 1

act2 : MEKiPP := MEKiPP - 1

act3 : ERKMEKiPP := ERKMEKiPP + 1

END

Rec94r \triangleq

STATUS

ordinary

WHEN

grd1 : ERKMEKiPP \geq 1

THEN

act1 : ERKMEKiPP := ERKMEKiPP - 1

act2 : ERK := ERK + 1

act3 : MEKiPP := MEKiPP + 1

END

Rec95f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKMEKiPP \geq 1

THEN

act1 : ERKMEKiPP := ERKMEKiPP - 1

act2 : ERKiP := ERKiP + 1

act3 : MEKiPP := MEKiPP + 1

END

Rec96f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKiP \geq 1 \wedge MEKiPP \geq 1

THEN

act1 : ERKiP := ERKiP - 1

act2 : MEKiPP := MEKiPP - 1

act3 : ERKiPMEKiPP := ERKiPMEKiPP + 1

END

Rec96r \triangleq

STATUS

ordinary

WHEN

```

    grd1 : ERKiPMEKiPP ≥ 1
  THEN
    act1 : ERKiPMEKiPP := ERKiPMEKiPP - 1
    act2 : ERKiP := ERKiP + 1
    act3 : MEKiPP := MEKiPP + 1
  END

```

Rec97f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKiPMEKiPP ≥ 1

THEN

act1 : ERKiPMEKiPP := ERKiPMEKiPP - 1

act2 : ERKiPP := ERKiPP + 1

act3 : MEKiPP := MEKiPP + 1

END

Rec98f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKiPP ≥ 1 \wedge Phosphatase3 ≥ 1

THEN

act1 : ERKiPP := ERKiPP - 1

act2 : Phosphatase3 := Phosphatase3 - 1

act3 : ERKiPPPhosphatase3 := ERKiPPPhosphatase3 + 1

END

Rec98r \triangleq

STATUS

ordinary

WHEN

grd1 : ERKiPPPhosphatase3 ≥ 1

THEN

act1 : ERKiPPPhosphatase3 := ERKiPPPhosphatase3 - 1

act2 : ERKiPP := ERKiPP + 1

act3 : Phosphatase3 := Phosphatase3 + 1

END

Rec99f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKiPPPhosphatase3 ≥ 1

THEN

act1 : ERKiPPPhosphatase3 := ERKiPPPhosphatase3 - 1

act2 : ERKiP := ERKiP + 1

act3 : Phosphatase3 := Phosphatase3 + 1

END

Rec100f \triangleq

STATUS

ordinary

WHEN

grd1 : ERKiP ≥ 1 \wedge Phosphatase3 ≥ 1

THEN

act1 : ERKiP := ERKiP - 1

act2 : Phosphatase3 := Phosphatase3 - 1

act3 : ERKiPPPhosphatase3 := ERKiPPPhosphatase3 + 1

END

Rec100r \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{ERKiPPHosphatase3} \geq 1$ **THEN**act1 : $\text{ERKiPPHosphatase3} := \text{ERKiPPHosphatase3} - 1$ act2 : $\text{ERKiP} := \text{ERKiP} + 1$ act3 : $\text{Phosphatase3} := \text{Phosphatase3} + 1$ **END****Rec101f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{ERKiPPHosphatase3} \geq 1$ **THEN**act1 : $\text{ERKiPPHosphatase3} := \text{ERKiPPHosphatase3} - 1$ act2 : $\text{ERK} := \text{ERK} + 1$ act3 : $\text{Phosphatase3} := \text{Phosphatase3} + 1$ **END****Rec102f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAP} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAP} := \text{EGFEGFR0dimGAP} - 1$ act2 : $\text{EGFEGFRi0dimGAP} := \text{EGFEGFRi0dimGAP} + 1$ **END****Rec103f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc} := \text{EGFEGFR0dimGAPShc} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc} := \text{EGFEGFRi0dimGAPShc} + 1$ **END****Rec104f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0} := \text{EGFEGFR0dimGAPShc0} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0} := \text{EGFEGFRi0dimGAPShc0} + 1$ **END****Rec105f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSos} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSos} := \text{EGFEGFR0dimGAPGrbdimSos} - 1$ act2 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} + 1$ **END**

Rec106f \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSos} \geq 1 \wedge \text{Prot} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSos} := \text{EGFEGFR0dimGAPGrbdimSos} - 1$ act2 : $\text{Prot} := \text{Prot} - 1$ act3 : $\text{EGFEGFR0dimGAPGrbdimSosProt} := \text{EGFEGFR0dimGAPGrbdimSosProt} + 1$ **END****Rec106r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSosProt} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSosProt} := \text{EGFEGFR0dimGAPGrbdimSosProt} - 1$ act2 : $\text{EGFEGFR0dimGAPGrbdimSos} := \text{EGFEGFR0dimGAPGrbdimSos} + 1$ act3 : $\text{Prot} := \text{Prot} + 1$ **END****Rec107f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSosProt} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSosProt} := \text{EGFEGFR0dimGAPGrbdimSosProt} - 1$ act2 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} + 1$ act3 : $\text{Proti} := \text{Proti} + 1$ **END****Rec108f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSosRasGDP} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSosRasGDP} := \text{EGFEGFR0dimGAPGrbdimSosRasGDP} - 1$ act2 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPGrbdimSosRasGDP} + 1$ **END****Rec109f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSosRasGDP} \geq 1 \wedge \text{Prot} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSosRasGDP} := \text{EGFEGFR0dimGAPGrbdimSosRasGDP} - 1$ act2 : $\text{Prot} := \text{Prot} - 1$ act3 : $\text{EGFEGFR0dimGAPGrbdimSosRasGDPProt} := \text{EGFEGFR0dimGAPGrbdimSosRasGDPProt} + 1$ **END****Rec109r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSosRasGDPProt} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSosRasGDPProt} := \text{EGFEGFR0dimGAPGrbdimSosRasGDPProt} - 1$ act2 : $\text{EGFEGFR0dimGAPGrbdimSosRasGDP} := \text{EGFEGFR0dimGAPGrbdimSosRasGDP} + 1$

act3 : Prot := Prot + 1
END

Rec110f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSosRasGDPProt \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSosRasGDPProt := EGFEGFR0dimGAPGrbdimSosRasGDPProt - 1

act2 : EGFEGFR0dimGAPGrbdimSosRasGDP := EGFEGFR0dimGAPGrbdimSosRasGDP + 1

act3 : Proti := Proti + 1

END

Rec111f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSosRasGTP \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSosRasGTP := EGFEGFR0dimGAPGrbdimSosRasGTP - 1

act2 : EGFEGFRi0dimGAPGrbdimSosRasGTP := EGFEGFRi0dimGAPGrbdimSosRasGTP + 1

END

Rec112f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSosRasGTP \geq 1 \wedge Prot \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSosRasGTP := EGFEGFR0dimGAPGrbdimSosRasGTP - 1

act2 : Prot := Prot - 1

act3 : EGFEGFR0dimGAPGrbdimSosRasGTPProt := EGFEGFR0dimGAPGrbdimSosRasGTPProt + 1

END

Rec112r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSosRasGTPProt \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSosRasGTPProt := EGFEGFR0dimGAPGrbdimSosRasGTPProt - 1

act2 : EGFEGFR0dimGAPGrbdimSosRasGTP := EGFEGFR0dimGAPGrbdimSosRasGTP + 1

act3 : Prot := Prot + 1

END

Rec113f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPGrbdimSosRasGTPProt \geq 1

THEN

act1 : EGFEGFR0dimGAPGrbdimSosRasGTPProt := EGFEGFR0dimGAPGrbdimSosRasGTPProt - 1

act2 : EGFEGFRi0dimGAPGrbdimSosRasGTP := EGFEGFRi0dimGAPGrbdimSosRasGTP + 1

act3 : Proti := Proti + 1

END

Rec114f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0Grbdim \geq 1

THENact1 : $\text{EGFEGFR0dimGAPShc0Grbdim} := \text{EGFEGFR0dimGAPShc0Grbdim} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} + 1$ **END****Rec115f** \triangleq **STATUS**

ordinary

WHENgrd1 : $\text{EGFEGFR0dimGAPShc0Grbdim} \geq 1 \wedge \text{Prot} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0Grbdim} := \text{EGFEGFR0dimGAPShc0Grbdim} - 1$ act2 : $\text{Prot} := \text{Prot} - 1$ act3 : $\text{EGFEGFR0dimGAPShc0GrbdimProt} := \text{EGFEGFR0dimGAPShc0GrbdimProt} + 1$ **END****Rec115r** \triangleq **STATUS**

ordinary

WHENgrd1 : $\text{EGFEGFR0dimGAPShc0GrbdimProt} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimProt} := \text{EGFEGFR0dimGAPShc0GrbdimProt} - 1$ act2 : $\text{EGFEGFR0dimGAPShc0Grbdim} := \text{EGFEGFR0dimGAPShc0Grbdim} + 1$ act3 : $\text{Prot} := \text{Prot} + 1$ **END****Rec116f** \triangleq **STATUS**

ordinary

WHENgrd1 : $\text{EGFEGFR0dimGAPShc0GrbdimProt} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimProt} := \text{EGFEGFR0dimGAPShc0GrbdimProt} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} + 1$ act3 : $\text{Proti} := \text{Proti} + 1$ **END****Rec117f** \triangleq **STATUS**

ordinary

WHENgrd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} := \text{EGFEGFR0dimGAPShc0GrbdimSos} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} + 1$ **END****Rec118f** \triangleq **STATUS**

ordinary

WHENgrd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} \geq 1 \wedge \text{Prot} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} := \text{EGFEGFR0dimGAPShc0GrbdimSos} - 1$ act2 : $\text{Prot} := \text{Prot} - 1$ act3 : $\text{EGFEGFR0dimGAPShc0GrbdimSosProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosProt} + 1$ **END****Rec118r** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosProt} \geq 1$

THEN

act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosProt} - 1$

act2 : $\text{EGFEGFR0dimGAPShc0GrbdimSos} := \text{EGFEGFR0dimGAPShc0GrbdimSos} + 1$

act3 : $\text{Prot} := \text{Prot} + 1$

END**Rec119f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosProt} \geq 1$

THEN

act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosProt} - 1$

act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} + 1$

act3 : $\text{Proti} := \text{Proti} + 1$

END**Rec120f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDP} \geq 1$

THEN

act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGDP} - 1$

act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} + 1$

END**Rec121f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDP} \geq 1 \wedge \text{Prot} \geq 1$

THEN

act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGDP} - 1$

act2 : $\text{Prot} := \text{Prot} - 1$

act3 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt} + 1$

END**Rec121r** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt} \geq 1$

THEN

act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt} - 1$

act2 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGDP} + 1$

act3 : $\text{Prot} := \text{Prot} + 1$

END**Rec122f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt} \geq 1$

THEN

act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGDPProt} - 1$

act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} + 1$

act3 : $\text{Proti} := \text{Proti} + 1$

END

Rec123f \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGTP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGTP} + 1$ **END****Rec124f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} \geq 1 \wedge \text{Prot} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} - 1$ act2 : $\text{Prot} := \text{Prot} - 1$ act3 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt} + 1$ **END****Rec124r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt} - 1$ act2 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGTP} + 1$ act3 : $\text{Prot} := \text{Prot} + 1$ **END****Rec125f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt} := \text{EGFEGFR0dimGAPShc0GrbdimSosRasGTPProt} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGTP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGTP} + 1$ act3 : $\text{Proti} := \text{Proti} + 1$ **END****Rec126f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSos} \geq 1 \wedge \text{ERKPP} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSos} := \text{EGFEGFR0dimGAPGrbdimSos} - 1$ act2 : $\text{ERKPP} := \text{ERKPP} - 1$ act3 : $\text{EGFEGFR0dimGAPGrbdimSosERKPP} := \text{EGFEGFR0dimGAPGrbdimSosERKPP} + 1$ **END****Rec126r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFR0dimGAPGrbdimSosERKPP} \geq 1$ **THEN**act1 : $\text{EGFEGFR0dimGAPGrbdimSosERKPP} := \text{EGFEGFR0dimGAPGrbdimSosERKPP} - 1$ act2 : $\text{EGFEGFR0dimGAPGrbdimSos} := \text{EGFEGFR0dimGAPGrbdimSos} + 1$

act3 : ERKPP := ERKPP + 1
END

Rec127f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dimGAPGrbdimSos $\geq 1 \wedge$ ERKiPP ≥ 1

THEN

act1 : EGFEGFRi0dimGAPGrbdimSos := EGFEGFRi0dimGAPGrbdimSos - 1

act2 : ERKiPP := ERKiPP - 1

act3 : EGFEGFRi0dimGAPGrbdimSosERKiPP := EGFEGFRi0dimGAPGrbdimSosERKiPP + 1

END

Rec127r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dimGAPGrbdimSosERKiPP ≥ 1

THEN

act1 : EGFEGFRi0dimGAPGrbdimSosERKiPP := EGFEGFRi0dimGAPGrbdimSosERKiPP - 1

act2 : EGFEGFRi0dimGAPGrbdimSos := EGFEGFRi0dimGAPGrbdimSos + 1

act3 : ERKiPP := ERKiPP + 1

END

Rec128f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0GrbdimSos $\geq 1 \wedge$ ERKPP ≥ 1

THEN

act1 : EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos - 1

act2 : ERKPP := ERKPP - 1

act3 : EGFEGFR0dimGAPShc0GrbdimSosERKPP := EGFEGFR0dimGAPShc0GrbdimSosERKPP + 1

END

Rec128r \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFR0dimGAPShc0GrbdimSosERKPP ≥ 1

THEN

act1 : EGFEGFR0dimGAPShc0GrbdimSosERKPP := EGFEGFR0dimGAPShc0GrbdimSosERKPP - 1

act2 : EGFEGFR0dimGAPShc0GrbdimSos := EGFEGFR0dimGAPShc0GrbdimSos + 1

act3 : ERKPP := ERKPP + 1

END

Rec129f \triangleq

STATUS

ordinary

WHEN

grd1 : EGFEGFRi0dimGAPShc0GrbdimSos $\geq 1 \wedge$ ERKiPP ≥ 1

THEN

act1 : EGFEGFRi0dimGAPShc0GrbdimSos := EGFEGFRi0dimGAPShc0GrbdimSos - 1

act2 : ERKiPP := ERKiPP - 1

act3 : EGFEGFRi0dimGAPShc0GrbdimSosERKiPP := EGFEGFRi0dimGAPShc0GrbdimSosERKiPP + 1

END

Rec129r \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFRi0dimGAPShc0GrbdimSosERKiPP \geq 1$
THEN
 act1 : $EGFEGFRi0dimGAPShc0GrbdimSosERKiPP := EGFEGFRi0dimGAPShc0GrbdimSosERKiPP - 1$
 act2 : $EGFEGFRi0dimGAPShc0GrbdimSos := EGFEGFRi0dimGAPShc0GrbdimSos + 1$
 act3 : $ERKiPP := ERKiPP + 1$
END

Rec130f \triangleq

STATUS

ordinary

WHEN

grd1 : $Sos \geq 1 \wedge ERKPP \geq 1$

THEN

act1 : $Sos := Sos - 1$
 act2 : $ERKPP := ERKPP - 1$
 act3 : $SosERKPP := SosERKPP + 1$

END

Rec130r \triangleq

STATUS

ordinary

WHEN

grd1 : $SosERKPP \geq 1$

THEN

act1 : $SosERKPP := SosERKPP - 1$
 act2 : $Sos := Sos + 1$
 act3 : $ERKPP := ERKPP + 1$

END

Rec131f \triangleq

STATUS

ordinary

WHEN

grd1 : $Sos \geq 1 \wedge ERKiPP \geq 1$

THEN

act1 : $Sos := Sos - 1$
 act2 : $ERKiPP := ERKiPP - 1$
 act3 : $SosERKiPP := SosERKiPP + 1$

END

Rec131r \triangleq

STATUS

ordinary

WHEN

grd1 : $SosERKiPP \geq 1$

THEN

act1 : $SosERKiPP := SosERKiPP - 1$
 act2 : $Sos := Sos + 1$
 act3 : $ERKiPP := ERKiPP + 1$

END

Rec132f \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFRi0dimGAP \geq 1$

THEN

act1 : $EGFEGFRi0dimGAP := EGFEGFRi0dimGAP - 1$
 act2 : $EGFEGFRi0dimdeg := EGFEGFRi0dimdeg + 1$

END

Rec133f \triangleq

STATUS**ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdim} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPGrbdim} := \text{EGFEGFRi0dimGAPGrbdim} - 1$ act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$ **END****Rec134f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdimSos} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPGrbdimSos} := \text{EGFEGFRi0dimGAPGrbdimSos} - 1$ act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$ **END****Rec135f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGDP} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPGrbdimSosRasGDP} - 1$ act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$ **END****Rec136f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGTP} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPGrbdimSosRasGTP} := \text{EGFEGFRi0dimGAPGrbdimSosRasGTP} - 1$ act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$ **END****Rec137f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPShc} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPShc} := \text{EGFEGFRi0dimGAPShc} - 1$ act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$ **END****Rec138f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPShc0} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPShc0} := \text{EGFEGFRi0dimGAPShc0} - 1$ act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$ **END****Rec139f** \triangleq **STATUS****ordinary**

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0Grbdim} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0Grbdim} := \text{EGFEGFRi0dimGAPShc0Grbdim} - 1$

act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$

END**Rec140f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSos} := \text{EGFEGFRi0dimGAPShc0GrbdimSos} - 1$

act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$

END**Rec141f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGDP} - 1$

act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$

END**Rec142f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGTP} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosRasGTP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosRasGTP} - 1$

act2 : $\text{EGFEGFRi0dimdeg} := \text{EGFEGFRi0dimdeg} + 1$

END**Rec143f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPGrbdimSosERKPP} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPGrbdimSosERKPP} := \text{EGFEGFRi0dimGAPGrbdimSosERKPP} - 1$

act2 : $\text{EGFEGFRi0dimGAPGrbdimSosdeg} := \text{EGFEGFRi0dimGAPGrbdimSosdeg} + 1$

END**Rec143r** \triangleq **STATUS**

ordinary

WHEN

grd1 : $\text{EGFEGFRi0dimGAPGrbdimSosdeg} \geq 1 \wedge \text{ERKPP} \geq 1$

THEN

act1 : $\text{EGFEGFRi0dimGAPGrbdimSosdeg} := \text{EGFEGFRi0dimGAPGrbdimSosdeg} - 1$

act2 : $\text{ERKPP} := \text{ERKPP} - 1$

act3 : $\text{EGFEGFRi0dimGAPGrbdimSosERKPP} := \text{EGFEGFRi0dimGAPGrbdimSosERKPP} + 1$

END**Rec144f** \triangleq **STATUS**

ordinary

WHEN

grd1 : $EGFEGFRi0dimGAPShc0GrbdimSosERKPP \geq 1$
THEN
 act1 : $EGFEGFRi0dimGAPShc0GrbdimSosERKPP := EGFEGFRi0dimGAPShc0GrbdimSosERKPP - 1$
 act2 : $EGFEGFRi0dimGAPShc0GrbdimSosdeg := EGFEGFRi0dimGAPShc0GrbdimSosdeg + 1$
 act3 : $ERKPP := ERKPP + 1$
END

Rec144r \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFRi0dimGAPShc0GrbdimSosdeg \geq 1 \wedge ERKPP \geq 1$

THEN

act1 : $EGFEGFRi0dimGAPShc0GrbdimSosdeg := EGFEGFRi0dimGAPShc0GrbdimSosdeg - 1$
 act2 : $ERKPP := ERKPP - 1$
 act3 : $EGFEGFRi0dimGAPShc0GrbdimSosERKPP := EGFEGFRi0dimGAPShc0GrbdimSosERKPP + 1$

END

Rec145f \triangleq

STATUS

ordinary

WHEN

grd1 : $SosERKPP \geq 1$

THEN

act1 : $SosERKPP := SosERKPP - 1$
 act2 : $Sosi := Sosi + 1$
 act3 : $ERKPP := ERKPP + 1$

END

Rec145r \triangleq

STATUS

ordinary

WHEN

grd1 : $Sosi \geq 1 \wedge ERKPP \geq 1$

THEN

act1 : $Sosi := Sosi - 1$
 act2 : $ERKPP := ERKPP - 1$
 act3 : $SosERKPP := SosERKPP + 1$

END

Rec146f \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFRi0dimGAPGrbdimSosERKiPP \geq 1$

THEN

act1 : $EGFEGFRi0dimGAPGrbdimSosERKiPP := EGFEGFRi0dimGAPGrbdimSosERKiPP - 1$
 act2 : $EGFEGFRi0dimGAPGrbdimSosdeg := EGFEGFRi0dimGAPGrbdimSosdeg + 1$
 act3 : $ERKiPP := ERKiPP + 1$

END

Rec146r \triangleq

STATUS

ordinary

WHEN

grd1 : $EGFEGFRi0dimGAPGrbdimSosdeg \geq 1 \wedge ERKiPP \geq 1$

THEN

act1 : $EGFEGFRi0dimGAPGrbdimSosdeg := EGFEGFRi0dimGAPGrbdimSosdeg - 1$
 act2 : $ERKiPP := ERKiPP - 1$
 act3 : $EGFEGFRi0dimGAPGrbdimSosERKiPP := EGFEGFRi0dimGAPGrbdimSosERKiPP + 1$

END

Rec147f \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosERKiPP} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosERKiPP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosERKiPP} - 1$ act2 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosdeg} := \text{EGFEGFRi0dimGAPShc0GrbdimSosdeg} + 1$ act3 : $\text{ERKiPP} := \text{ERKiPP} + 1$ **END****Rec147r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosdeg} \geq 1 \wedge \text{ERKiPP} \geq 1$ **THEN**act1 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosdeg} := \text{EGFEGFRi0dimGAPShc0GrbdimSosdeg} - 1$ act2 : $\text{ERKiPP} := \text{ERKiPP} - 1$ act3 : $\text{EGFEGFRi0dimGAPShc0GrbdimSosERKiPP} := \text{EGFEGFRi0dimGAPShc0GrbdimSosERKiPP} + 1$ **END****Rec148f** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{SosERKPPi} \geq 1$ **THEN**act1 : $\text{SosERKPPi} := \text{SosERKPPi} - 1$ act2 : $\text{Sosi} := \text{Sosi} + 1$ act3 : $\text{ERKPPi} := \text{ERKPPi} + 1$ **END****Rec148r** \triangleq **STATUS****ordinary****WHEN**grd1 : $\text{Sosi} \geq 1 \wedge \text{ERKPPi} \geq 1$ **THEN**act1 : $\text{Sosi} := \text{Sosi} - 1$ act2 : $\text{ERKPPi} := \text{ERKPPi} - 1$ act3 : $\text{SosERKPPi} := \text{SosERKPPi} + 1$ **END****END**