MAPK SIGNALING PATHWAY(part II)

PDGF FGF EGF

NT3/4 BDNF NGF *New* *New*

Outside

PDGFR *New* FGFR EGFR *New* TrkA/B *New* CACN

G12 GRB2

Ca²⁺

Gaplm SOS *New*

Heterotorimeric G-protein

Ras RasGRP RasGRF

IP₃

pl20GAP NF1 *New* $+p$ CNasGEF cAMP

PKC DAG

$+p$

Mos Rafl *New* RafB Rapl PKA $+p$

Phosphatidylinositol signaling system

$+p$

MEK2 *New* MEK1 *New* MP1 **Scaffold**

$+p$

MKP PTP $-p$ ERK

$+p$ IKK NIK

$+p$

MNK1/2 RSK2 cPLA2 STMN1 *New* Tau

$+p$ $+p$

$+p$

c-Myc Sapla Elk-1

$+p$

SRF CREB

PPP3C c-fos DNA

$-p$

NFkB

NFAT-2 DNA

Proliferation, differentiation

Proliferation, inflammation anti-apoptosis

Aviva Product
Not a Aviva Product
Another molecule, mostly chemical compound
---→ Indirect effect
—— Inhibition
+ Dissociation
+p Phosphorylation
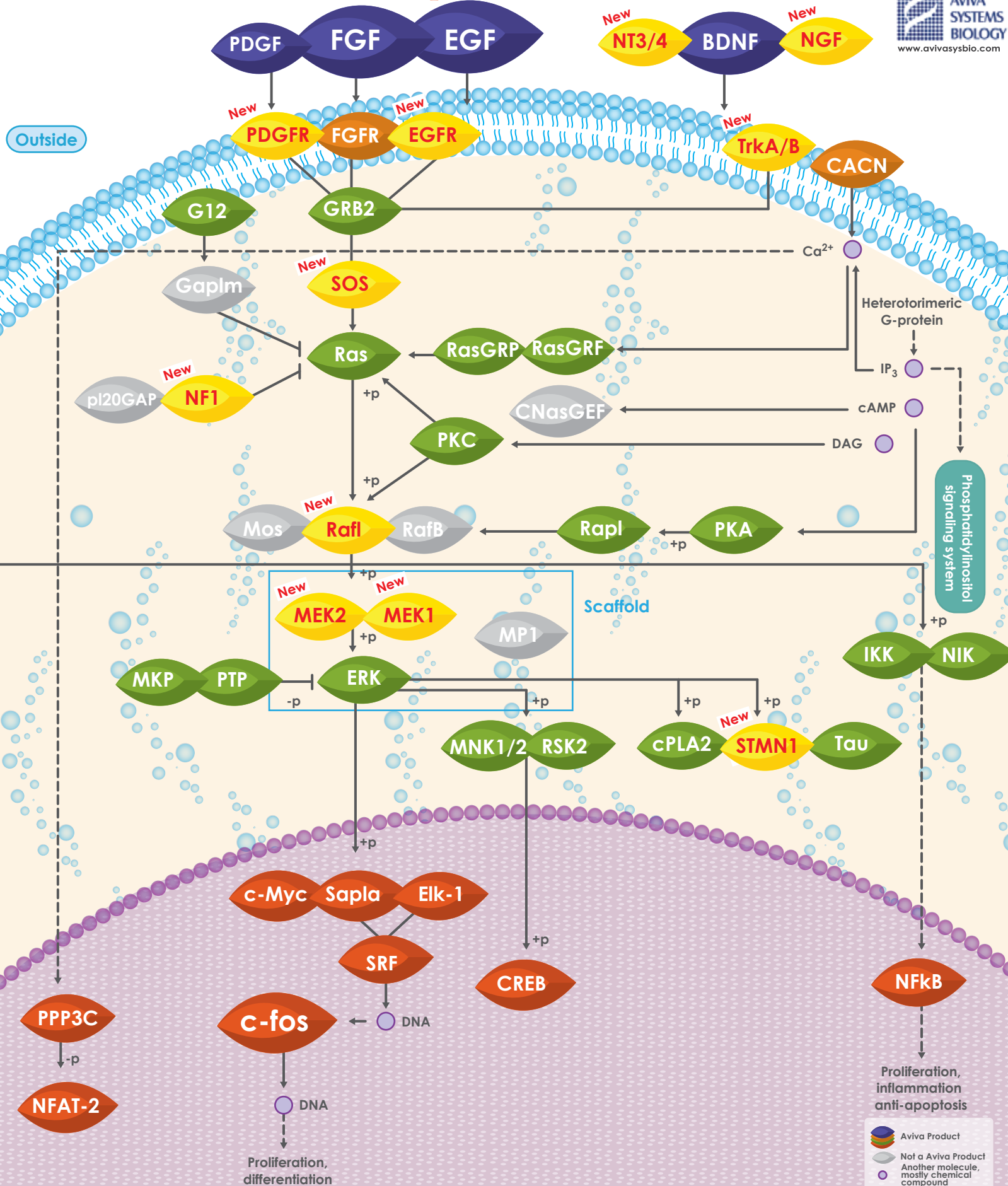-p Dephosphorylation

Pathway diagram below is compiled from data from the Kyote Encyclopedia of Genes and Genomes
Kanehisa, M., Goto, S., Furumichi, M., Tanabe, M., and Hirakawa, M.; KEGG for representation and analysis of molecular networks involving diseases and drugs. Nucleic Acids Res. 38, D355-D360 (2010). Kanehisa, M., Goto, S., Hattori, M., Aoki-Kinoshita, K.F., Itoh, M., Kawashima, S., Katayama, T., Araki, M., and Hirakawa, M.; From genomics to chemical genomics: new developments in KEGG. Nucleic Acids Res. 34, D354-357 (2006). Kanehisa, M. and Goto, S.; KEGG: Kyoto Encyclopedia of Genes and Genomes. Nucleic Acids Res. 28, 27-30 (2000).
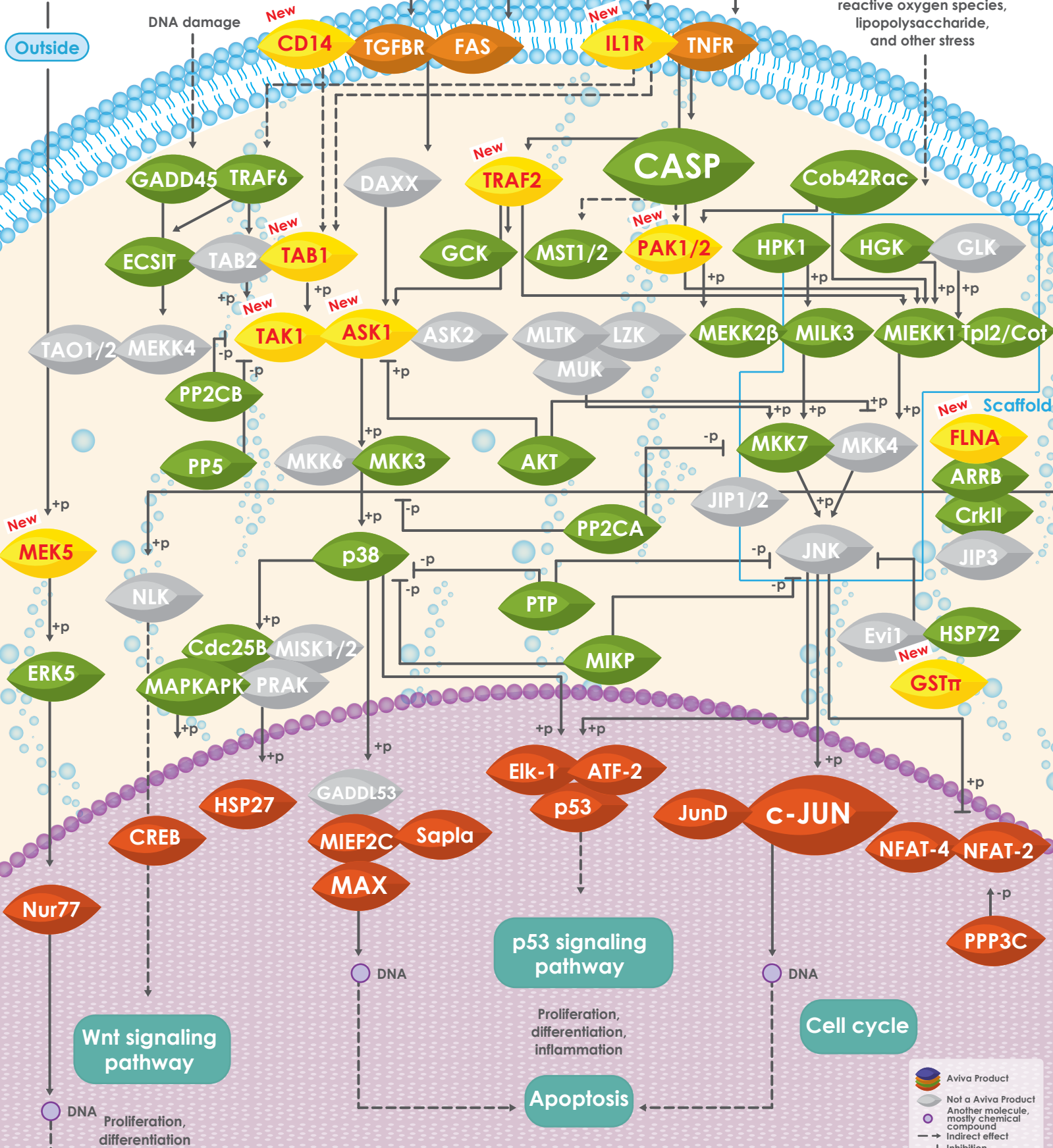
Nucleus

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MAPK SIGNALING PATHWAY (part I)

Serum, EGF,reactive oxygen species,or Srk tyrosinkinase downstream

LPS

TGFB FASL

IL1 TNF New

Serum, cytotoxic drugs, irradiation, heatshock, reactive oxygen species, lipopolysaccharide, and other stress

Outside

DNA damage

CD14 New TGFBR FAS IL1R New TNFR

GADD45 TRAF6 DAXX TRAF2 New CASP Cob42Rac

ECSIT TAB2 TAB1 New GCK MST1/2 PAK1/2 New HPK1 HGK GLK

+p +p +p +p +p +p

TAO1/2 MEKK4 TAK1 New ASK1 New ASK2 MLTK LZK MEKK2β MILK3 MIEKK1 Tpl2/Cot

MUK

PP2CB -p -p +p

PP5 MKK6 MKK3 AKT +p +p +p +p

+p MKK7 MKK4 FLNA New Scaffold

-p ARRB

MEK5 New JIP1/2 CrkII

+p PP2CA -p JNK JIP3

NLK p38 -p -p

+p PTP Evi1 HSP72

ERK5 Cdc25B MISK1/2 MIKP GSTπ New

MAPKAPK PRAK +p

+p +p +p +p +p +p

+p Elk-1 ATF-2

HSP27 GADDL53 p53

CREB MIEF2C Sapla JunD c-JUN NFAT-4 NFAT-2

MAX -p

Nur77 p53 signaling pathway PPP3C

Wnt signaling pathway DNA Proliferation, differentiation, inflammation Cell cycle

DNA Apoptosis

DNA

Proliferation, differentiation

Nucleus

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Legend:
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Inhibition
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