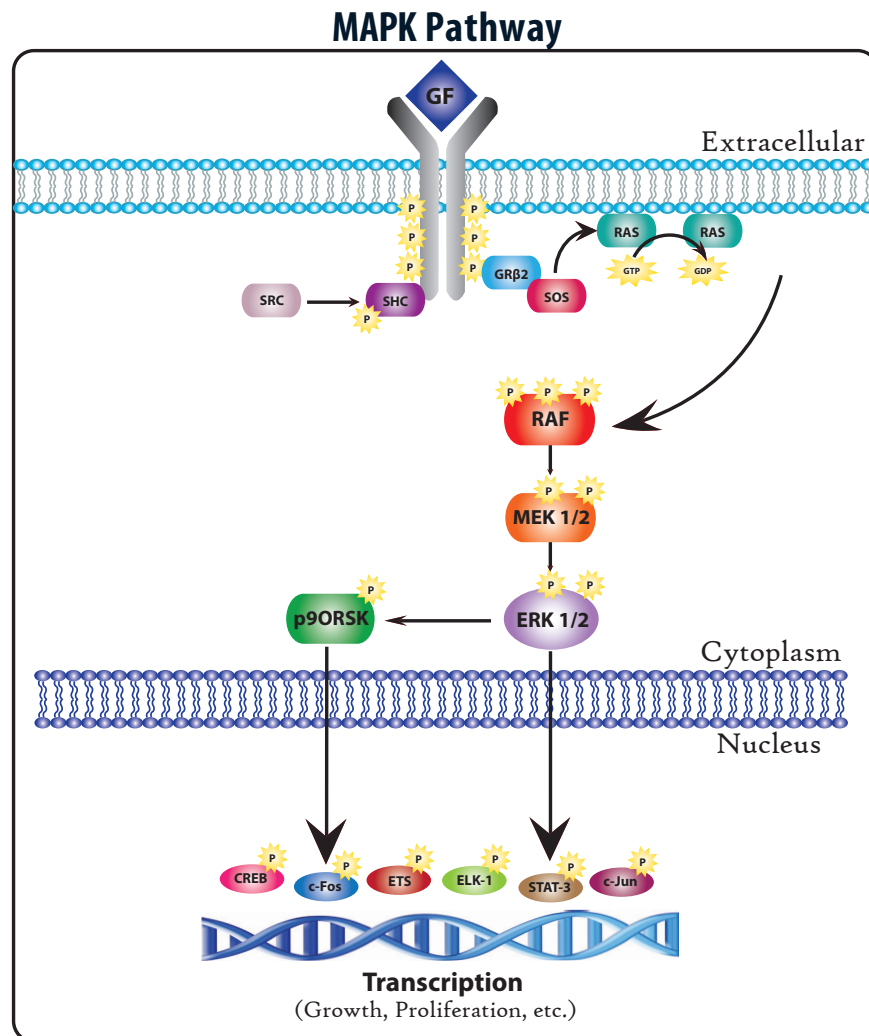


MAPK Pathway

Mitogen-activated protein kinases (MAPK) are proteins that are serine/ threonine specific kinases which are activated by a wide range of stimuli including proinflammatory cytokines, growth factors, mitogens, osmotic stress, heat shock etc. These proteins function in a signaling cascade are activated upon ligand binding to a cell surface receptor activating several MAP/ER kinases, which in turn phosphorylate their respective substrates. These events thereby regulate various cellular activities, such as gene expression, mitosis, differentiation, proliferation, and cell survival/ apoptosis.

Upon the extracellular mitogen binding to the ligand, Ras a GTPase exchanges GDP for GTP. This in turn initializes a cascade activating MAP3K (Raf) which in turn activates MAP2K which activates MAPK. This MAPK can activate a number of transcription factors which control key processes in the cell.

For example epidermal growth factor (EGF) binds the EGFR which activates the tyrosine kinase activity of the EGFR (receptor). Grb2 and SH2 domain containing proteins recognize phosphorylated residues along with a guanine nucleotide exchange factor SOS, and binds to the EGFR. GDP is then swapped for GTP which binds Ras to make it active. Ras activates Raf which can phosphorylate and activate MEK1 and MEK2 which in turn activate MAPK. MAPK regulates a number of transcription factors including c-myc, CREB, C-Fos etc. All these regulate expression of a number of genes involved in apoptosis, differentiation, cancer etc. Defects in the regulation of this pathway can lead to uncontrolled growth in cells, leading to cancer. Over the last decade, important advances have been made in developing novel agents that modulate key proteins in this pathway culminating in the approval by the FDA of Sorafenib (Nexavar®) for the treatment of advanced renal carcinoma. Therapeutic advances in this area should continue for many years to come.



Antibodies

Name	Cat. #
ASK1/MAPKKK5 Antibody	3128-100
cdc/Rac Blocking Peptide	3080BP-50
cdc42/Rac Antibody	3080-100
Phospho-Elk-1 Antibody	3388-100
Erk1/2 MAPK Antibody	3085-100
Phospho-Erk1/2 Antibody	3441-100
Erk2 Antibody	3442-100
Erk5 Antibody	3397-100
IL-1 alpha Antibody	5125-100
IL-1 beta Antibody	5128-100
IL-1 beta Antibody	5129-100
IRAK-4 Antibody	3580-100
JIK Antibody	3784-100
JIP-1 Antibody	3664-100
JNK Antibody	3701-100
Phospho-JKK1/SEK1/MKK4 Antibody	3478-100
Phospho-JNK/SAPK Antibody	3589-100
c-Jun antibody	3009-100
c-Jun Antibody	3702-100
Phospho-c-Jun (Ser73) Antibody	3502-100
MAPKAPK-2 Antibody	3100-100
MAPKAPK-2 Blocking Peptide	3100-BP50
Phospho-MAPKAPK-2 Antibody	3434-100
Mek1 Antibody	3196-100
Mek1/2 Antibody	3518-100
Phospho-Mek1/2 Antibody	3519-100
MKK3 Antibody	3285-100
MLK3 Antibody	3430-100
Phospho-MSK1 Antibody	3278-100
NIK Antibody	3193R-100
p38 MAP Kinase Antibody	3114-100
p38 MAP Kinase Blocking Peptide	3114BP-50
Phospho-p38 MAPK Antibody	3438-100
p42/44 MAPK Antibody	3542-100
p70 S6 Kinase Antibody	3485-100
Phospho-p70 S6 Kinase Antibody	3505-100
PAK1 Antibody	3248-100
PAK2 Antibody	3443-100
PAK2 Blocking Peptide	3443BP-50
PAK3 Antibody	3686-100
PAK3 Blocking Peptide	3686BP-50
PAK4 Antibody	3444-100
PAK4 Blocking Peptide	3444BP-50
PAK5/PAK7 Antibody	3928-100
PAK5/PAK7 Blocking Peptide	3928-BP50
PAK6 Antibody	3927-100
PAK6 Blocking Peptide	3927BP-50

Antibodies Continued...

Name	Cat. #
PDGF-BB Antibody	5488-200
PDGF-BB Antibody	5489-100
Phospho-Raf Antibody	3504-100
Raf1 Antibody	3116-100
RIP Antibody	3279-100
RSK2 Antibody	3546-100
TAB1 Antibody	3682-100
TANK Polyclonal Antibody	3348-100
TAOK1 Antibody	3776-100
TAOK1 Antibody	3776R-100
TNF-alpha Antibody	3053R-100
TNF-beta Antibody	5345-100
TRAF6 Antibody	3566R-100

Enzymes

Name	Cat. #
ASK1, Active	7710-5
CD40Ligand/TRAP, human recombinant	4014-10, 50, 1000
CD40Ligand/TRAP, murine recombinant	4015-25, 100, 1000
ERK1, Active	7741-5
IGF-I, human recombinant	4119-100, 10000,
IL-1 alpha, human recombinant	4125-10, 50, 1000
IL-1 alpha, murine recombinant	4126-10, 50, 1000
IL-1 alpha, rat recombinant	4127-10, 1000
IL-1 beta, human recombinant	4128-10, 50, 1000
IL-1 beta, rat recombinant	4130-50
c-Jun (1-79)-GST Fusion Protein	7001-100
MAPKAPK2, Active	7737-5
MAPKAPK3, Active	7755-5
NGF-beta, human recombinant	4303-20, 1000
NGF-beta, human recombinant	4303R-20, 100, 1000
NGF-beta, murine recombinant	4304-5, 20, 100, 1000
p38beta, Active	7763-5, 100
p38alpha, Active	7756-5
P38delta, Active	7754-5
PAK4, Active	7707-5
PAK7, Active	7727-5
PDGF-AA, human recombinant	4482-10, 10000
PDGF-AA, murine recombinant	4483-10, 1000
PDGF-AB, human recombinant	4485-10, 10000
PDGF-BB, human recombinant	4488-10, 50, 1000
PDGF-BB, murine recombinant	4489-10, 50, 1000
PDGFR beta, Active	7770-5
RAF1, Active	7726-5, 100

Enzymes Continued...

Name	Cat. #
RSK1, Active	7721-5
RSK2, Active	7768-5
RSK3, Active	7774-5
TNF-alpha, human recombinant	1050-10, 50, 1000
TNF-alpha, murine recombinant	1051-10, 50, 1000
TNF-alpha, rat recombinant	1052-10, 50, 1000
TNF-beta, human recombinant	4345-20, 1000

Chemical Activator

Name	Cat. #
Anisomycin	1549-10

MAP Kinase/MEK Inhibitors

Name	Cat. #
7,3',4'-Trihydroxyisoflavone	1886-25, 100
Doramapimod	1954-5, 25
GSK-1120212	1960-1, 5
PathwayReady™ MAP Kinase Signaling Inhibitor Panel	K862-7
PD184352	1585-1, 5, 25
EZSolution™ PD184352	1871-1
PD 98059	1666-5
EZSolution™ PD 98059	1783-5
PD-0325901	1643-2, 5, 25
EZSolution™ PD-0325901, Sterile-Filtered	1990-1
SB 203580	1712-1, 5
EZSolution™ SB 203580	1786-1
Sorafenib	1594-25, 100
U0126	1668-5
VX-702	1598-1, 5
ZM 336372	1789-1, 5