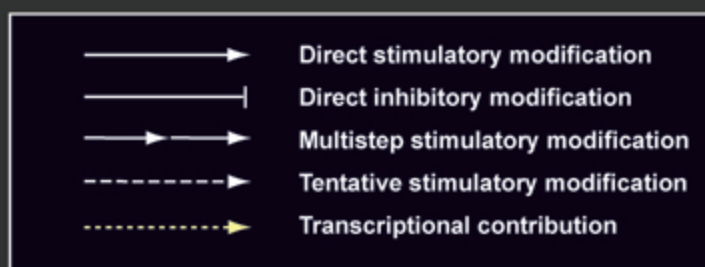
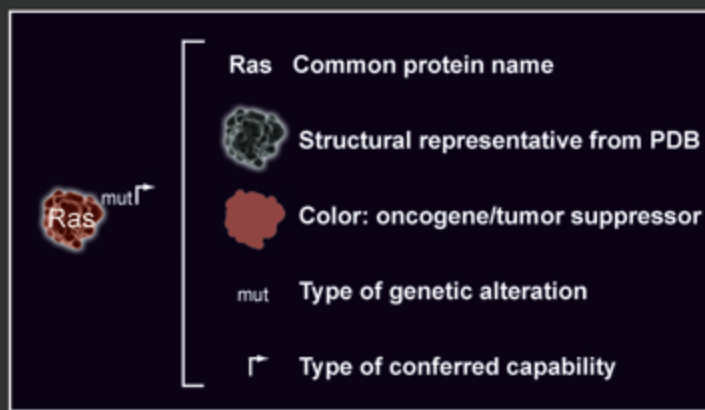


PATHWAYS IN HUMAN CANCER

This poster summarizes some of the key signaling pathways implicated in tumorigenesis and tumor progression in humans. Within each pathway, gene products known to be mutated in human tumors - oncogenes and tumor suppressor genes - have been color-coded. The most common types of genetic alterations and conferred capabilities to the tumor are also appended for these gene products. Proteins are shown using a structural representative (see structural legend). Since not all known pathways or proteins could be included, we regret not being able to show the work of many, and refer the viewer to the textbook *The Biology of Cancer* by Robert A. Weinberg for an in-depth treatment of this material and references.



TYPES OF GENETIC ALTERATIONS:	
mut	Point mutation
amp	Amplification
trans	Translocation
del	Deletion
vir	Viral infection
exp	Increased expression (unknown mechanism)

TYPES OF CONFERRED CAPABILITIES:	
†	Evading apoptosis
Γ	Self-sufficiency in growth signals
⊖	Insensitivity to anti-growth signals
∞	Tissue invasion & metastasis
∞	Limitless replicative potential
∞	Sustained angiogenesis

STRUCTURAL REPRESENTATIVES	
14-3-3	Scaffolds
$\alpha_v\beta_3$	Integrins
Bacteriorhodopsin	7-Transmembrane Receptor
Bax	Pro-apoptotic
Bcl-2	Anti-apoptotic
E-cadherin	Cadherins
CDK2	Cyclin Dependent Kinases
Cyclin E	Cyclins
EGFR	Receptor Tyrosine Kinases
GRB2	Adaptors
Max	Transcription Factors
p16	CDK Inhibitors
Pla2	Phospholipases
PTEN	Phosphatases
Ras	G proteins
PKA	Kinases
RasGAP	GTPase-Activating Protein
EF1 β	Guanine Exchange Factors
Survivin	Inhibitor of Apoptosis Proteins (IAPs)
Caspase-8	Proteases

TUMOR SUPPRESSORS: 
 ONCOGENES: 

