7.013 Section problem: Oncogenes and Tumor Suppressors

For the following a-d, state whether the procedure could cause cells to lose growth control. Explain your reasoning.

a) A copy of the activated ras oncogene isolated from a tumor is introduced into a cell that carries two normal copies of the ras proto-oncogene.

b) A copy of the mutant Rb tumor suppressor gene is introduced into a cell carrying two normal copies of the Rb gene.

c) A copy of the gene for epidermal growth factor receptor (EGFR) that encodes a mutant, constitutively active receptor is introduced into a cell that carries two normal copies of the EGFR gene.

d) A normal erythropoietin (epo) cDNA (encodes a growth factor for erythroid stem cells) attached to a constitutive promoter is introduced into an erythroid stem cell that carries two normal copies of the erythropoietin gene.

e) Would introduction of a normal copy of the Rb gene into a retinoblast cell that was Rb+/Rb- alter the probability of the cell becoming a tumor cell? Explain.