

Copy of a printed diagram referenced as "Schematic of the mechanism in a normal cell"

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protein produced by a mutated structural gene should in its synthesis obey the same controls as the normal (wild-type) protein.

(2) Mutations of a regulator gene, in contrast, may affect the syn-

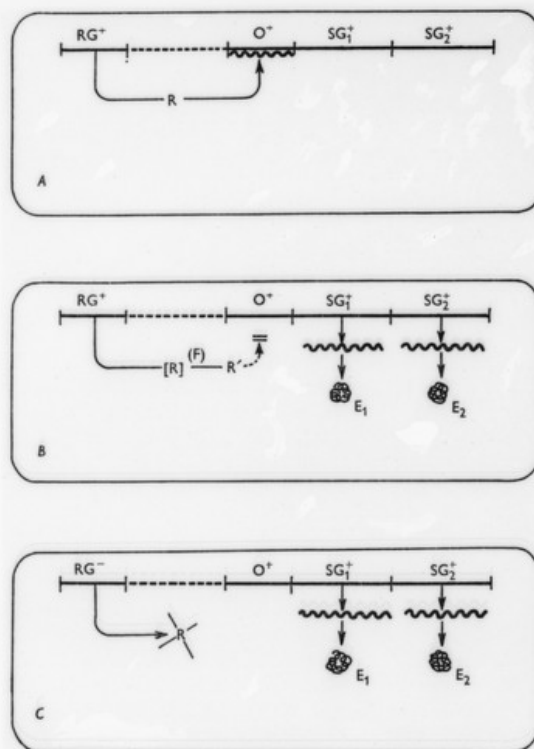


Fig. 3. Schematic of the mechanism of induction in a normal (wild-type) cell and of the effect of a mutation of the regulator gene. (A) Induced wild-type cell. The repressor synthesized by the regulator gene attaches to the operator and thereby blocks the transcription of both structural genes (SG_1^+ , SG_2^+). (B) In presence of inducer (F), the repressor is converted to the inactive form (R'). Transcription of both SG_1^+ and SG_2^+ is allowed; both enzymes E_1 and E_2 are synthesized. (C) Inactivation of the regulator gene (or of its product, the repressor) results in 'uncontrolled' (constitutive) synthesis of E_1 and E_2 .

they should generally result in...
or proteins) at a high rate, irrespecti
of the effector (inducer or metabolic re

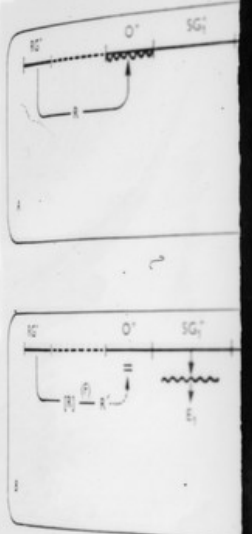


Fig. 4. Schematic of the effects of a mutation of a structural gene in a normal cell. (A) In the absence of inducer, transcript is not synthesized. (B) In the presence of inducer, transcript is synthesized. The normal structural gene (SG_1^+) produces normal enzyme E_1 . The mutated structural gene (SG_1^-) produces an altered (inactive) protein.

(B) Finally, structural and regulatory mutations should be genetically distinct; i.e. non-allelic. This implies that they should 'map' at different loci. If the regulator gene is assumed to be a structural gene, the regulator gene should control the synthesis of the repressor (in genetic terminology both in the wild-type and in the mutant). This means that 'constitutive' mutations should behave as recessive to the wild-