

The "White Box" (or "autogenous regulation") model of development of an organism predicts that living "machines" should react by a recovery to perturbations caused by their environment, and that this recovery should be most visible in individuals which are in their growing age. The recovery from induced lesions means the reinforced transcription of particular gene sequences. In case such non-scheduled transcription will overlap the period of the DNA maturation (or another period during which the 5'-3' bonds are disjoined) we shall expect the amplification of genetic material coding for destructed or "consumed" constituents. (Selective gene amplifications in cell cultures exposed for a long time to various destructive environments are well confirmed experimentally — see Fig. 3 and [11,12].)

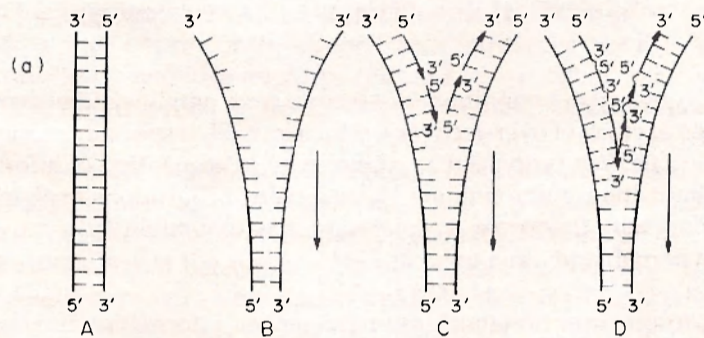


Fig. 2a. The maturation of discontinuously synthesized DNA (from De Robertis Cell Biology, Saunders, Philadelphia, 1975). (A) the two antiparallel strands of DNA; (B) separation of the strands; (C) beginning of replication by the synthesis of short chains in 5'-3' direction; and (D) joining of the segments by a DNA ligase.

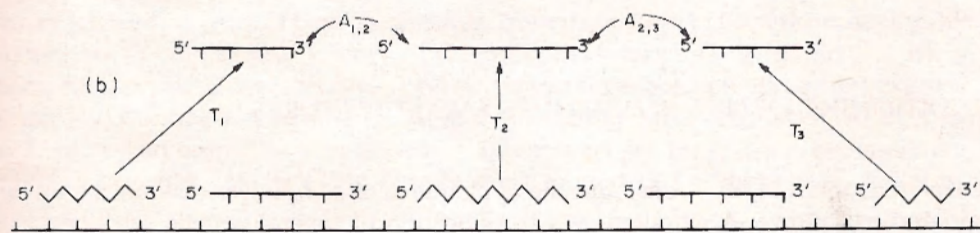


Fig. 2b. Diagram of the mechanism of amplification and recombination of unmatured DNA exposed to a transcription. T.: Detachment of loosely connected segments by  $i$ th transcription;  $A_{i,k}$ : possible chemical association of detached segments;  $\wedge$ : DNA repair. The detachment of selected by transcription segments of DNA is facilitated in following situations: (a) very early cellular age; (b) intensive DNA repairs which induce in abundance endonucleases and thus weaken 3'-5' joints; (c) some "variable" regions of DNA are genetically preprogrammed to be joined only after a substantial delay; (d) enzymes controlling the strength of 3'-5' joints remain under hormonal control and thus the "capacity to learn" might be increased by strong environmental perturbations.