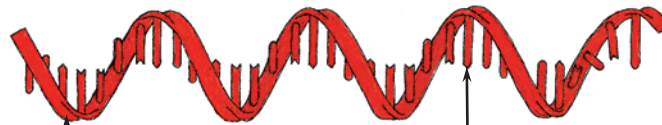


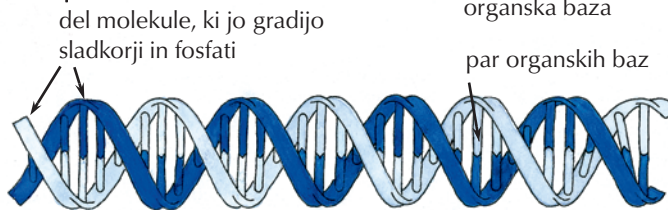
Osnovna zgradba polinukleotidne verige (ali kateregakoli lineranega polimera)

RNK
(ribonukleinska kislina)



ENOJNA VIJAČNICA

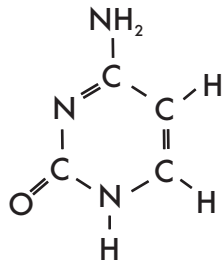
DNK
(deoksiribonukleinska kislina)



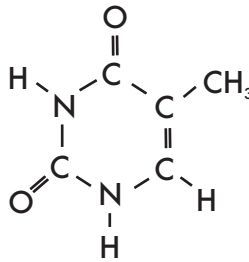
DVOJNA VIJAČNICA

Enojna in dvojna vijačnica

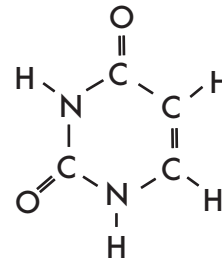
ENOOBROČASTE ORGANSKE BAZE
(pirimidinske)



C citozin

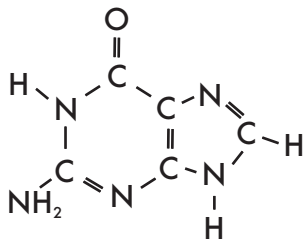


T timin

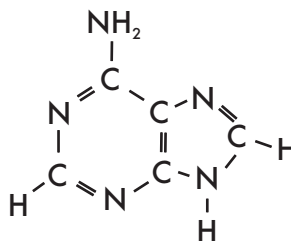


U uracil

DVOOBROČASTE ORGANSKE BAZE
(purinske)

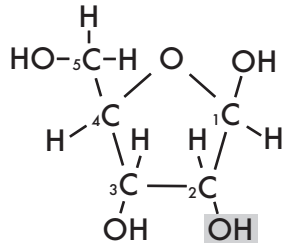


G gvanin

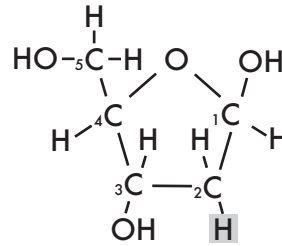


A adenin

Organske baze



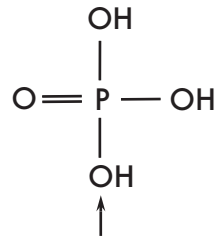
 riboza



 deoksiriboza

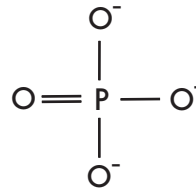
Riboza in deoksiriboza

FOSFORJEVA KISLINA
(H_3PO_4)

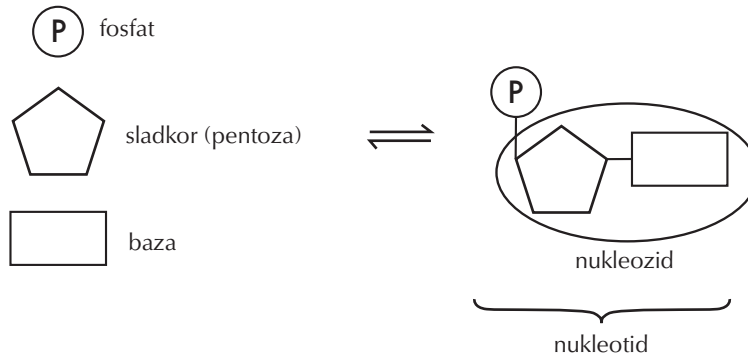


s tem delom se molekula veže na sladkor

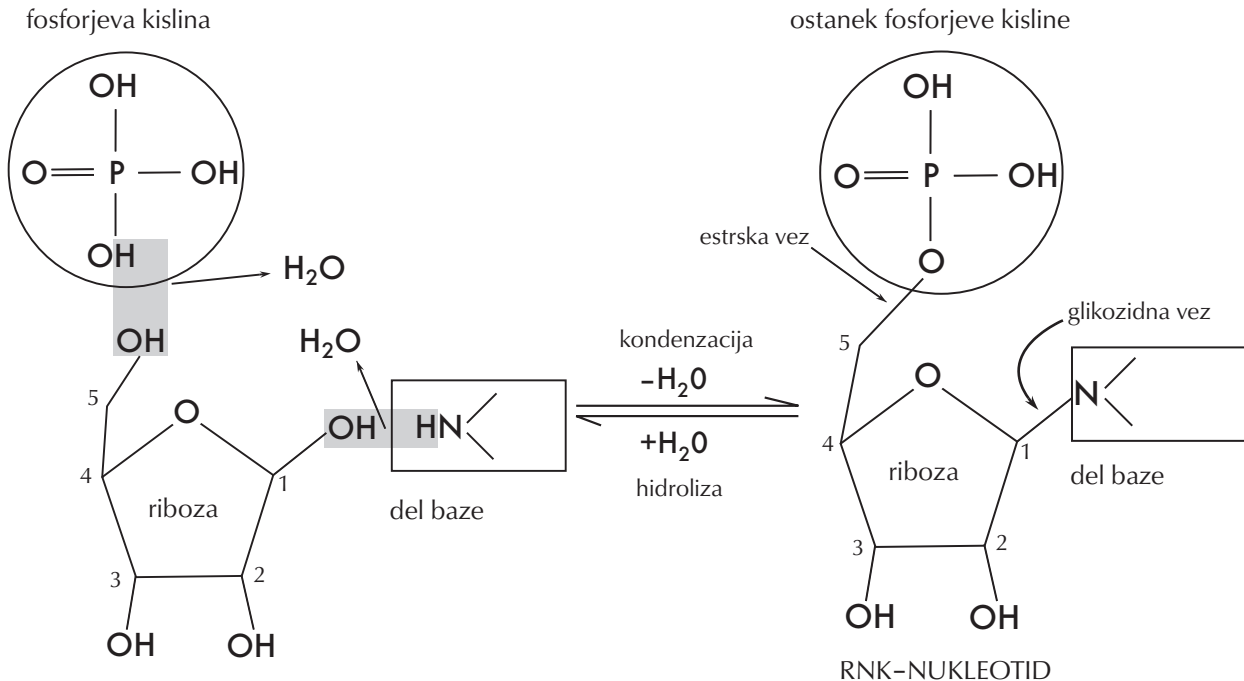
P FOSFAT
(PO_4^{3-})



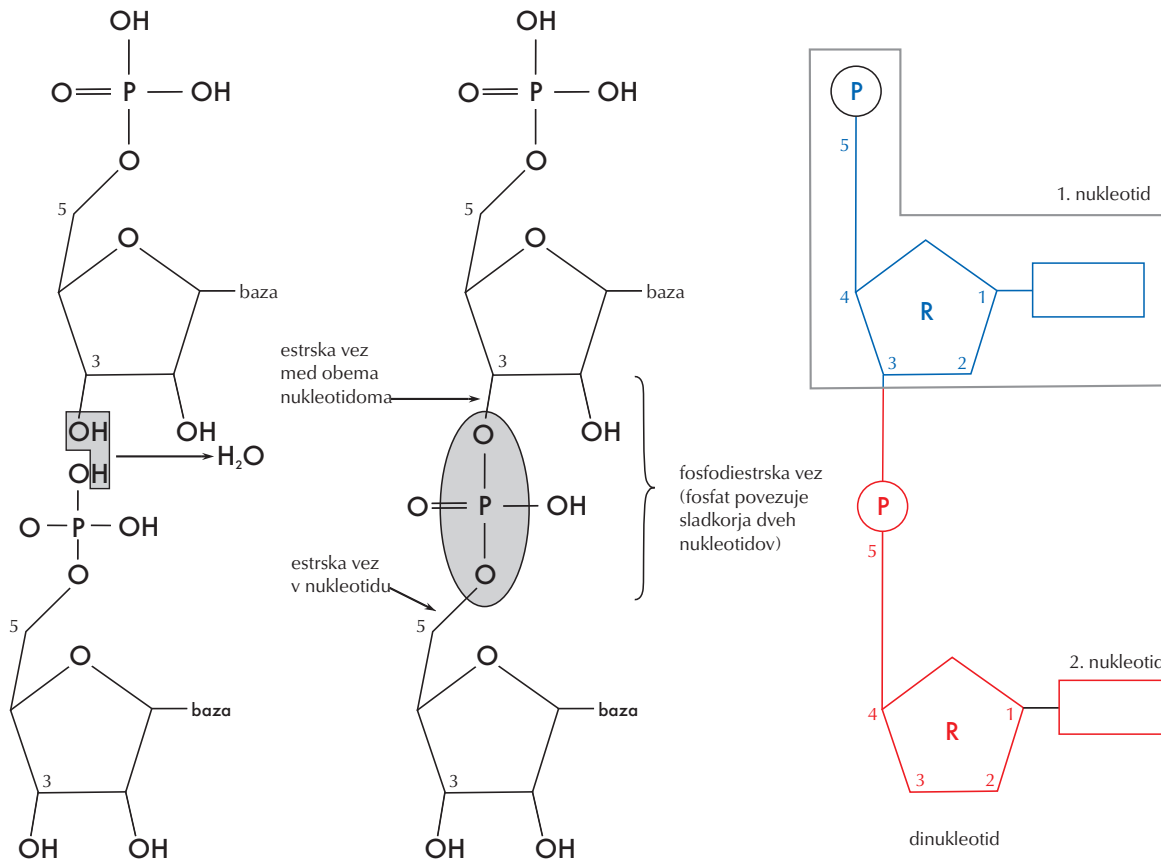
Ostanek fosforjeve kisline (fosfat)



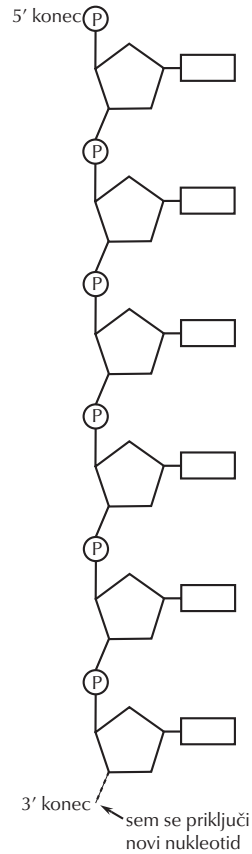
S simboli prikazan nastanek nukleotida



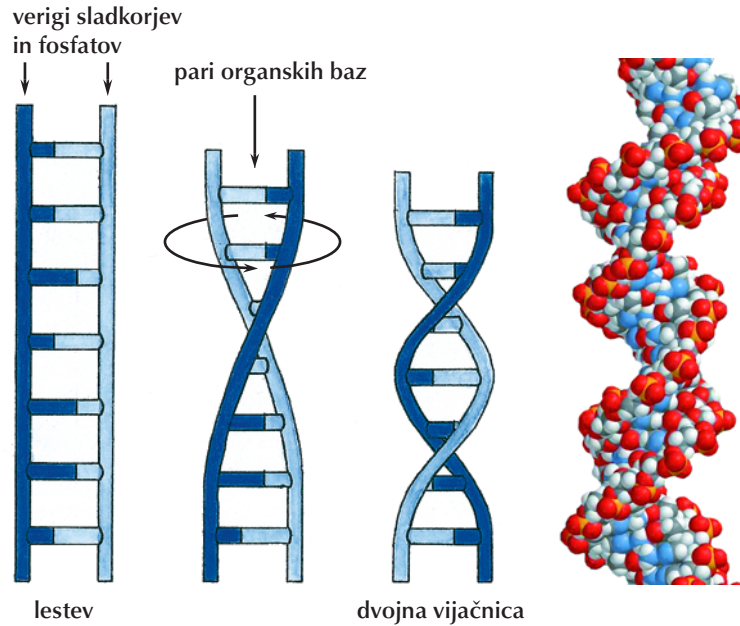
Nastanek nukleotida prikazan z delno izrisanimi molekulami. Vidimo lahko, iz katerih delov se voda odcepi (kondenzacija) in kam se vrine pri razpadu nukleotida (hidroliza).



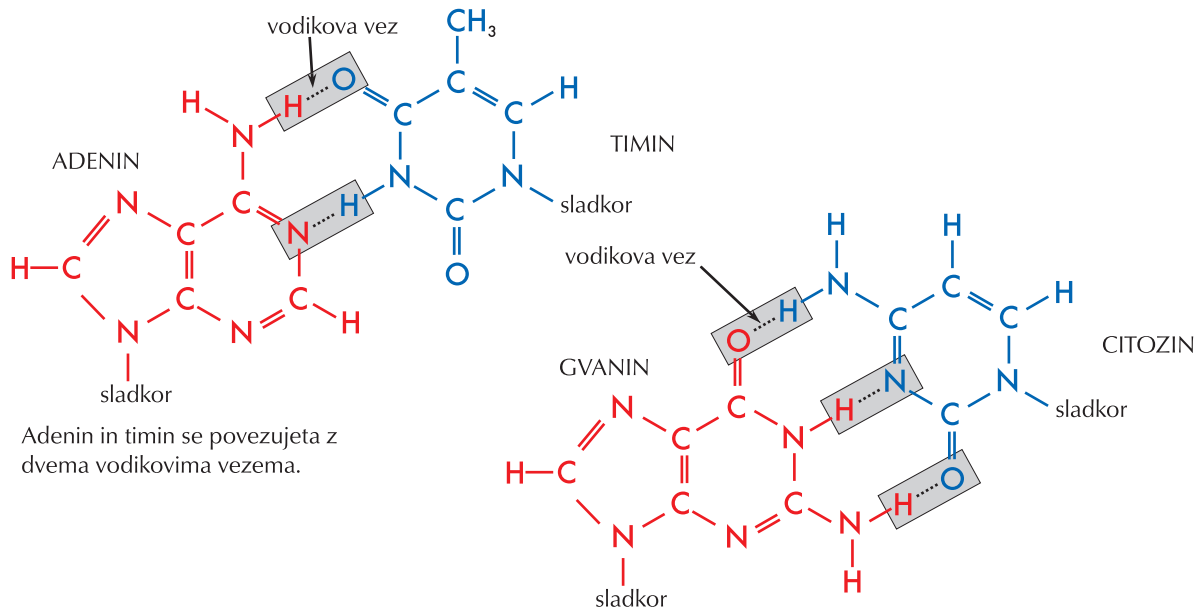
Nastanek dinukleotida



Osnovna zgradba polinukleotidne verige z označenima 3' in 5' koncem



Model DNK; levo - oblika lestve, sredina - zvijanje lestve, desno - tridimenzionalni model DNK

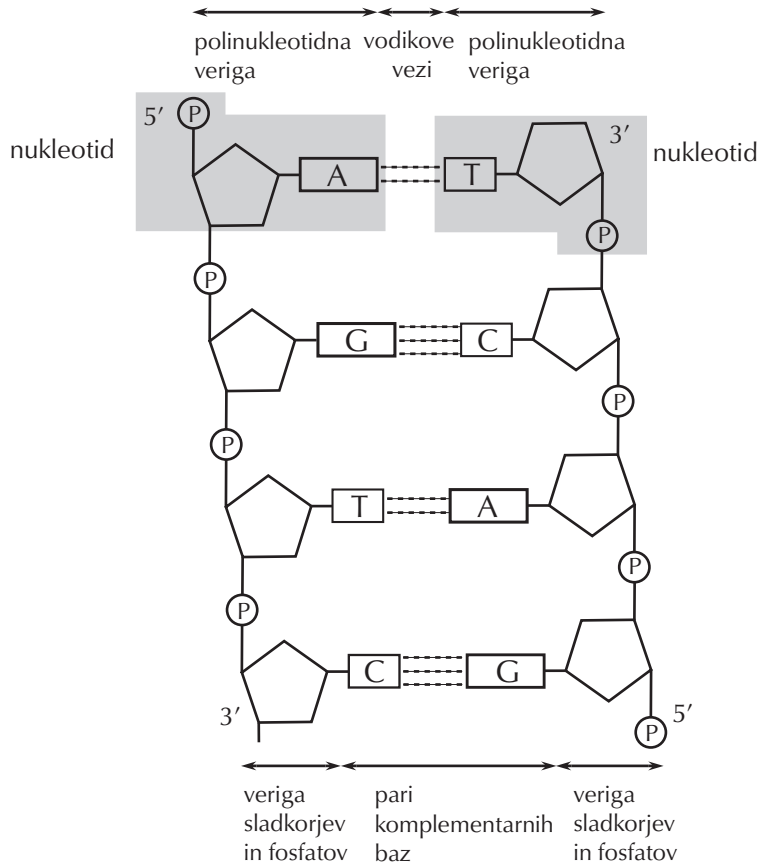


Adenin in timin se povezujeta z dvema vodikovima vezema.

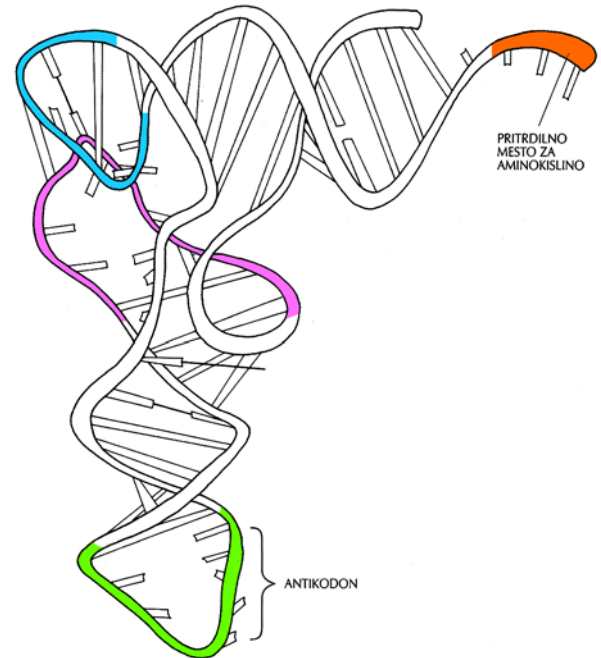
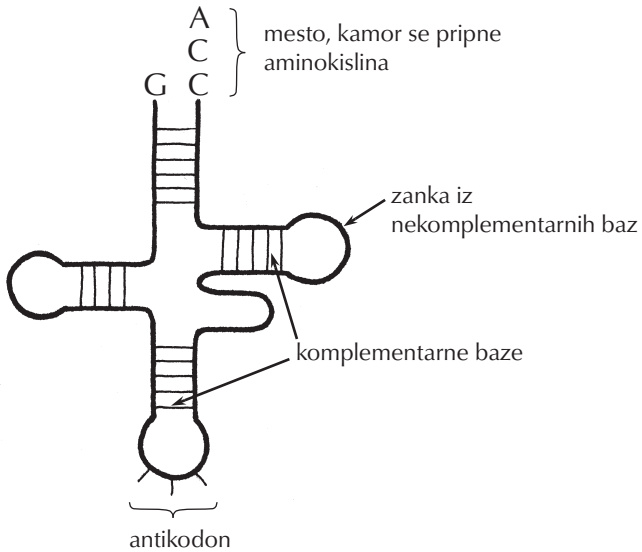
Gvanin in citozin se povezujeta s tremi vodikovimi vezmi.

Povezovanje komplementarnih baz (A = T, G = C)

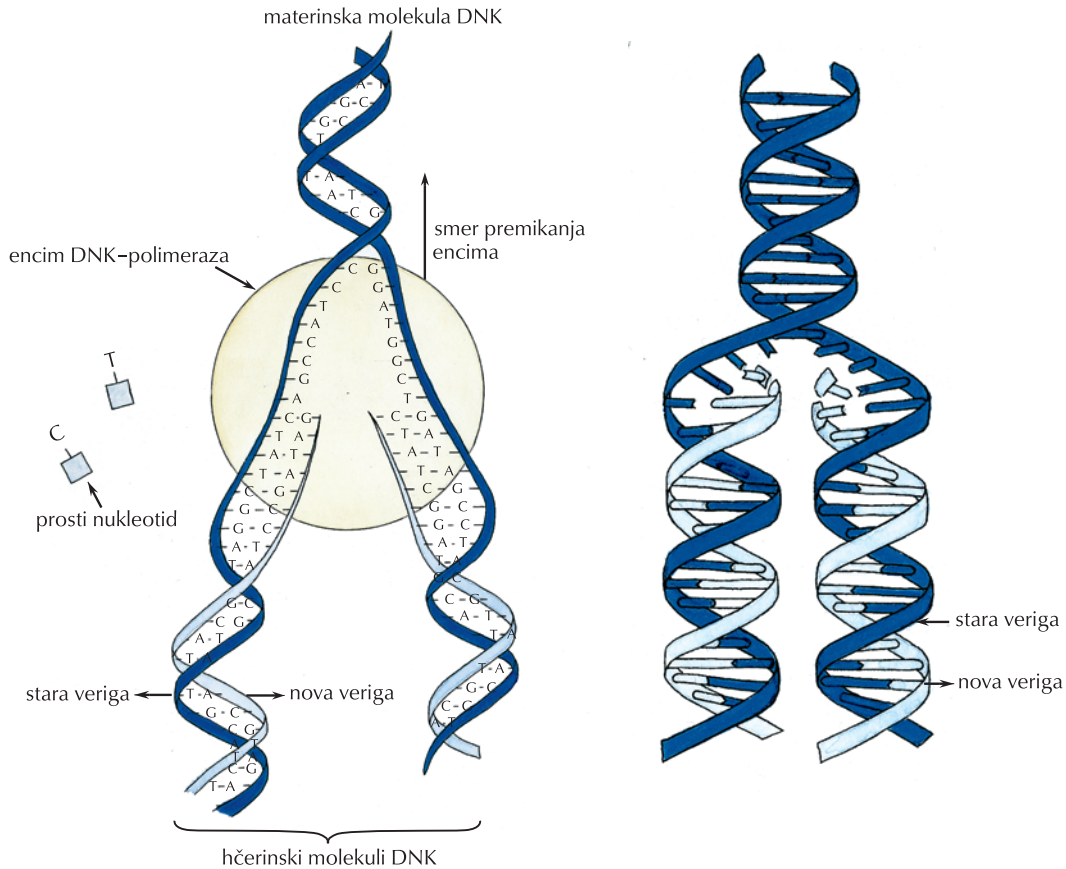
MOLEKULSKA GENETIKA



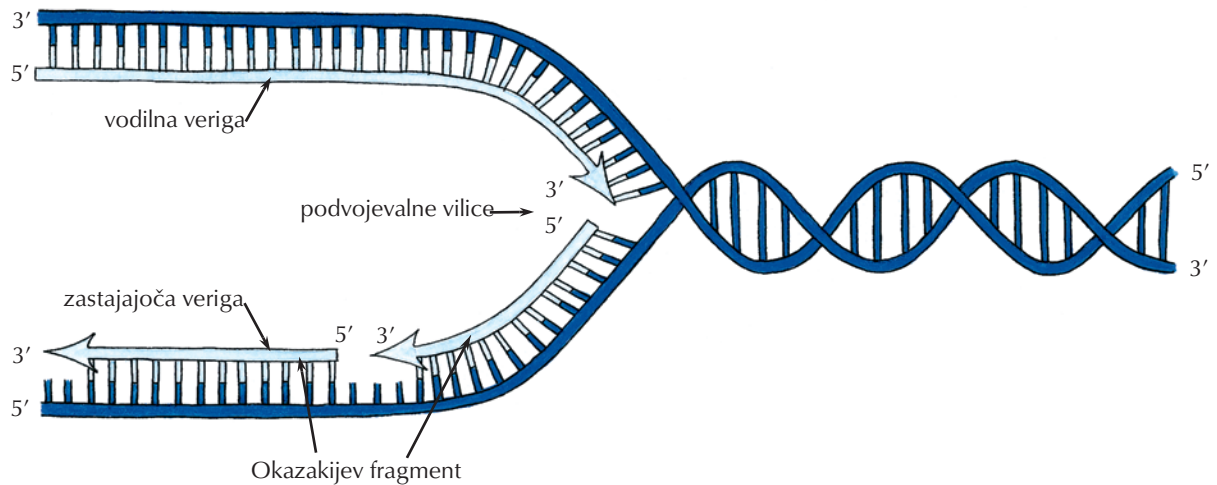
Antiparalelnost verig



Prenašalna RNK; levo – shematski prikaz v obliki triperesne deteljice, desno – prostorska struktura

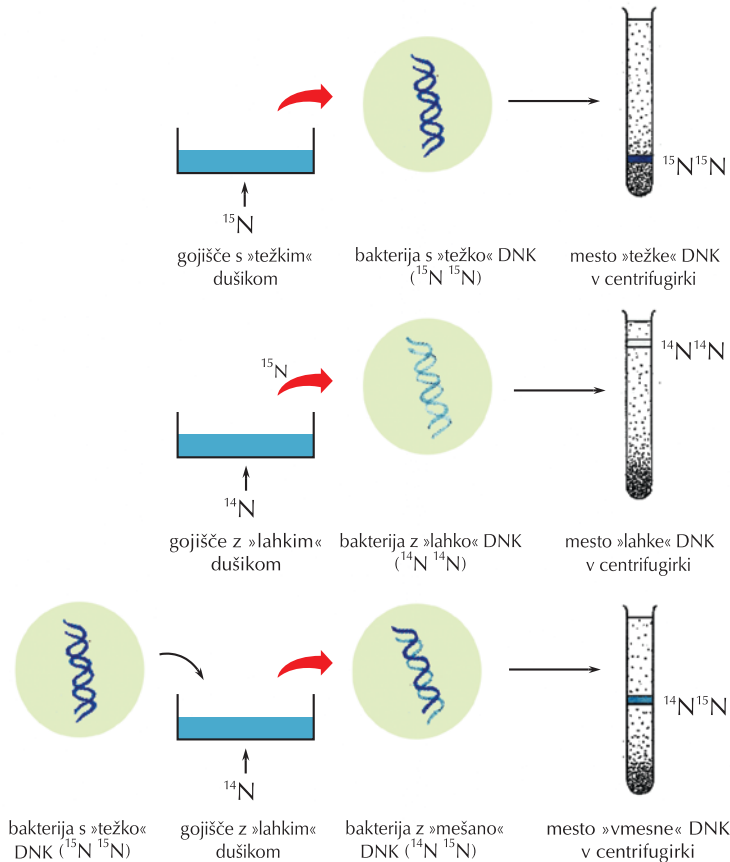


Podvajanje DNK

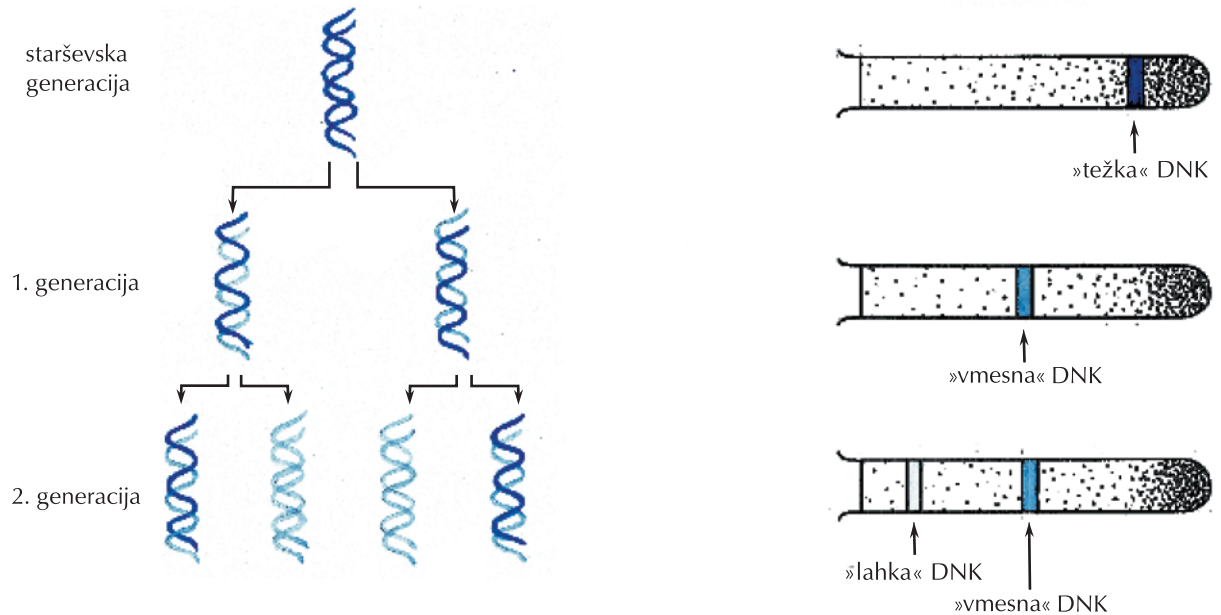


Nastajanje vodilne in zastajajoče verige ob podvojevalnih vilicah

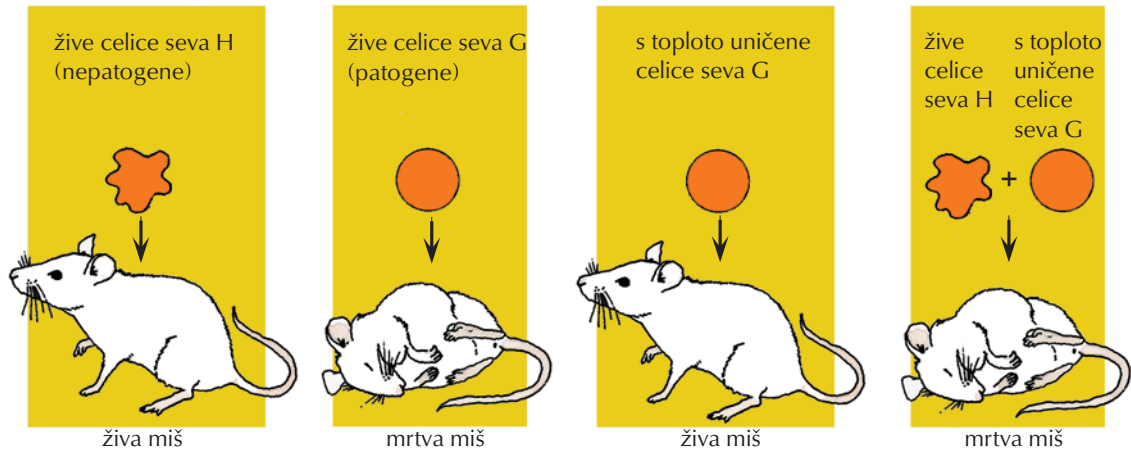
MOLEKULSKA GENETIKA



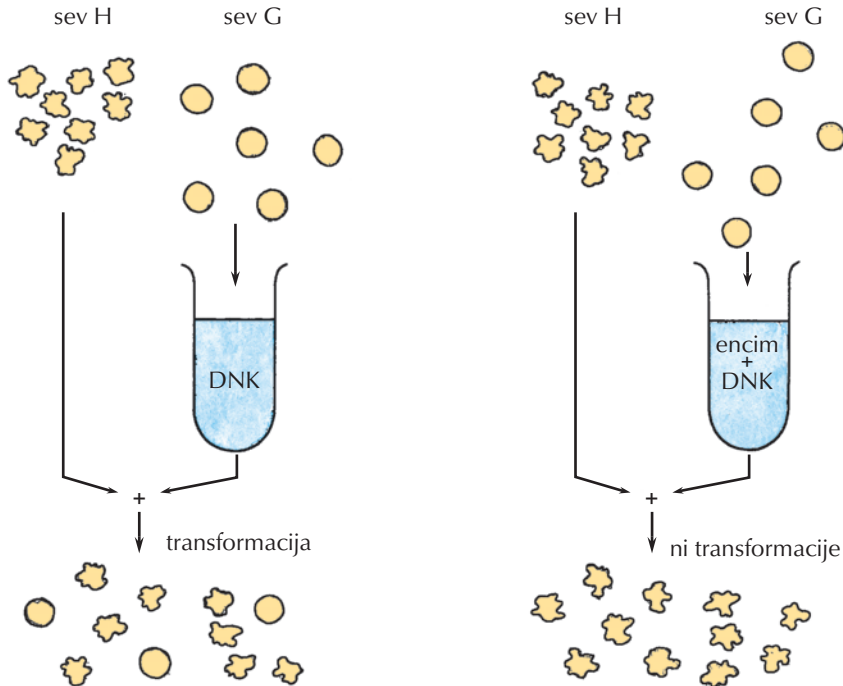
Poskus, ki sta ga izvedla Meselson in Stahl – določanje mesta težke, lahke in »vmesne« DNK v centrifugirki.



Poskus, ki sta ga izvedla Meselson in Stahl – dokaz za semikonzervativno podvajanje.

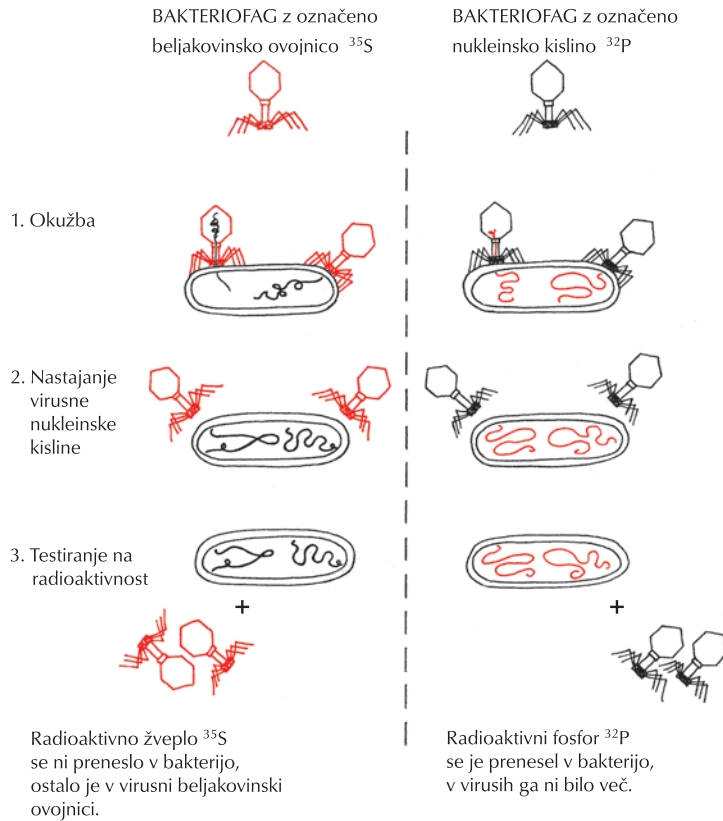


Griffithov poskus s pnevmokoki

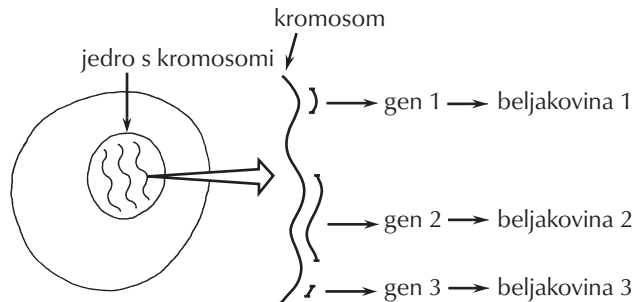


Dokaz, da je DNK nosilka lastnosti. Če so k bakterijam seva H dodali DNK seva G, je prišlo do transformacije. Nekateri bakterije iz nepatogenega seva H so postale patogene. Če pa so k bakterijam seva H dodali mešanico encima za razgradnjo DNK in DNK iz seva G, do transformacije ni prišlo.

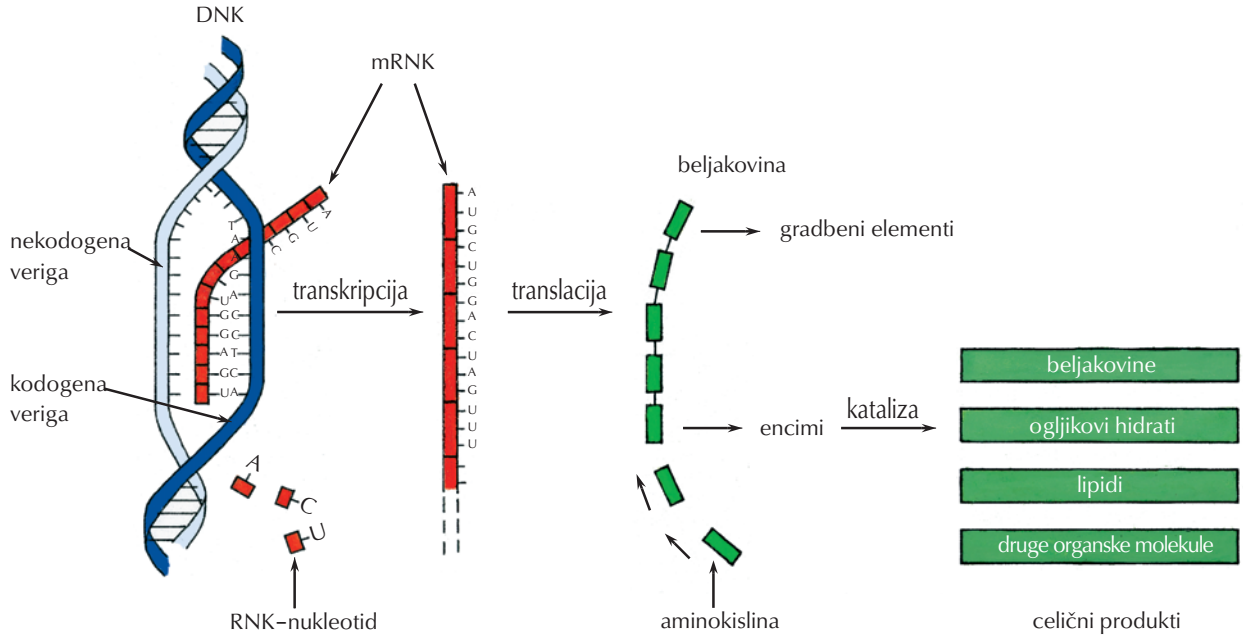
MOLEKULSKA GENETIKA



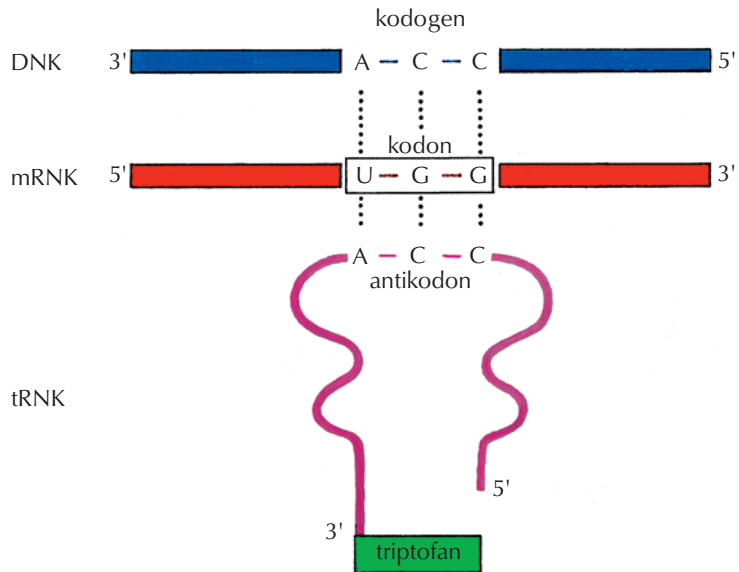
Poskus z označenimi bakteriofagi



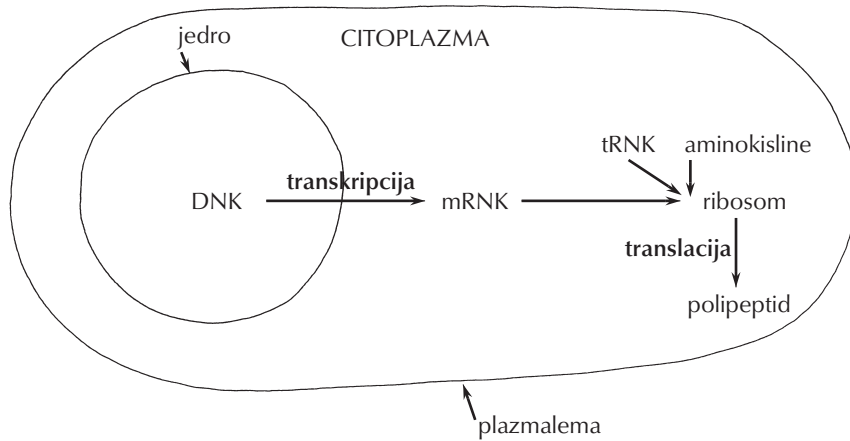
Na kromosomu so odseki, geni, ki nosijo zapis za nastanek beljakovine (proteina).



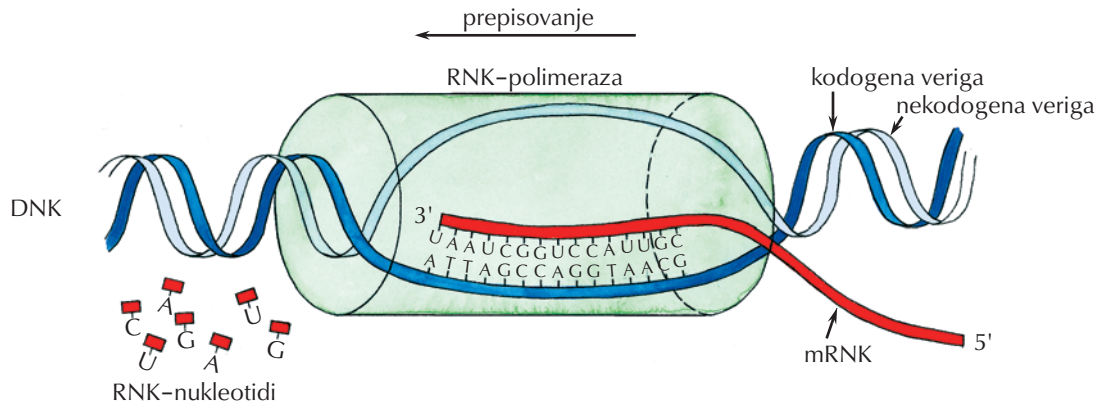
DNK preko encimov nadzira nastanek organskih snovi v celici.



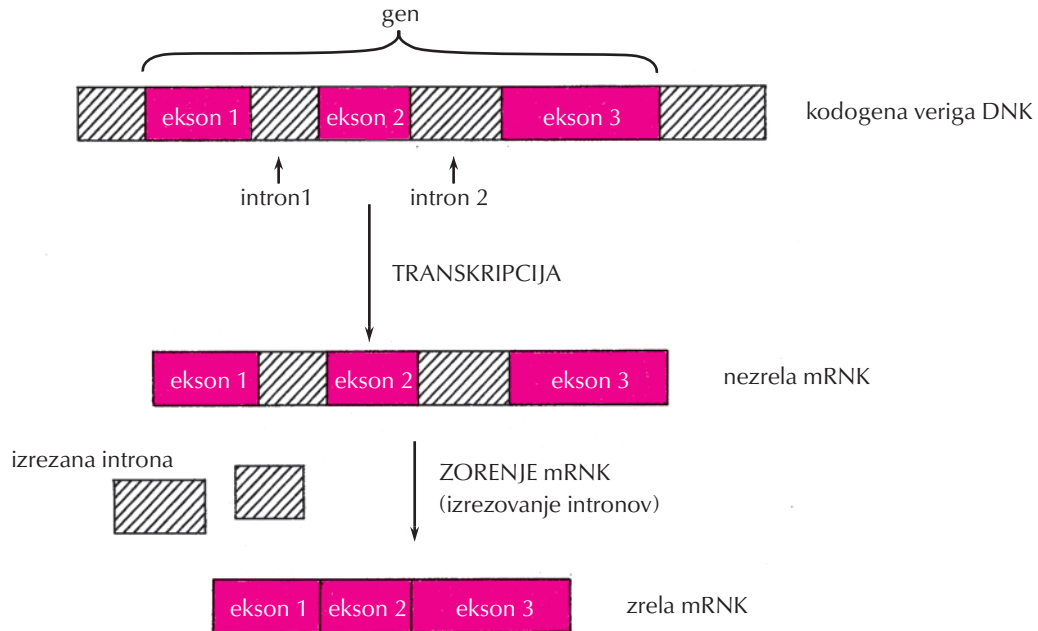
Kodogen, kodon in antikodon



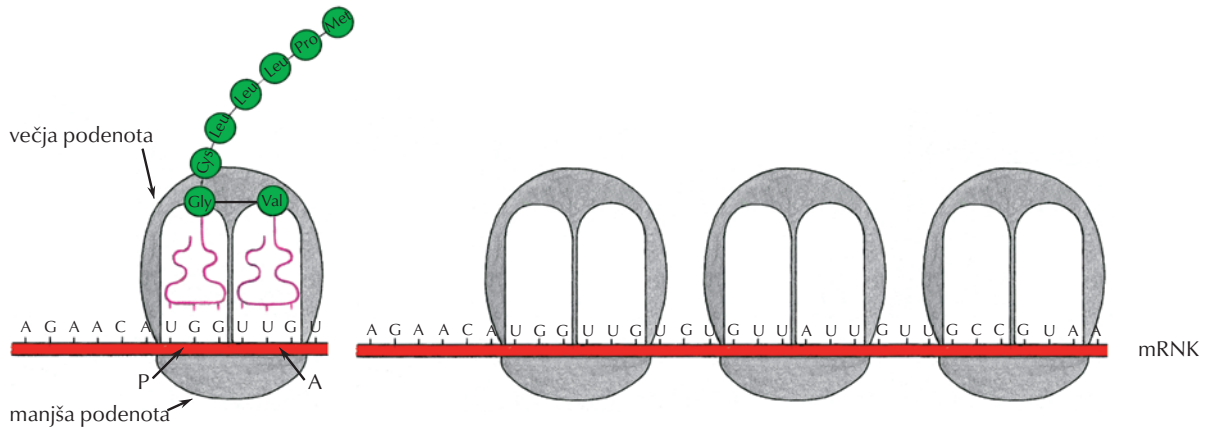
Sinteza beljakovin poteka v dveh korakih: prepisovanje (transkripcija) in prevajanje (translacija).



Prepisovanje ali transkripcija

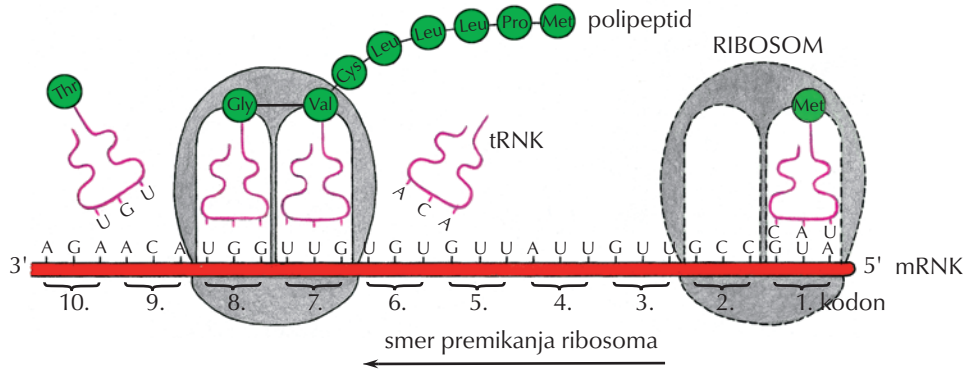


Prepisovanje pri evkariontih

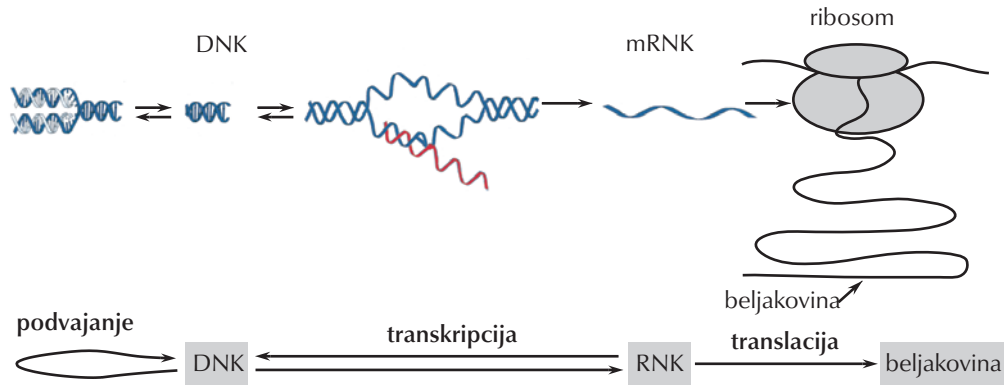


Levo – ribosom, desno – polisom

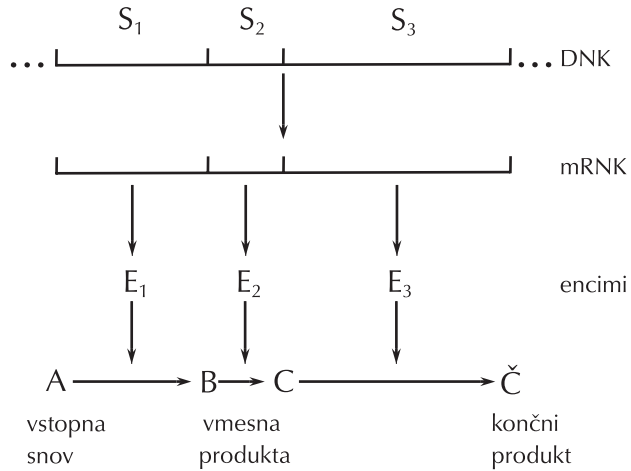
Na ribosomu sta označeni mesti A in P: na mesto A se veže tRNK, na mestu P se sintetizira beljakovina.



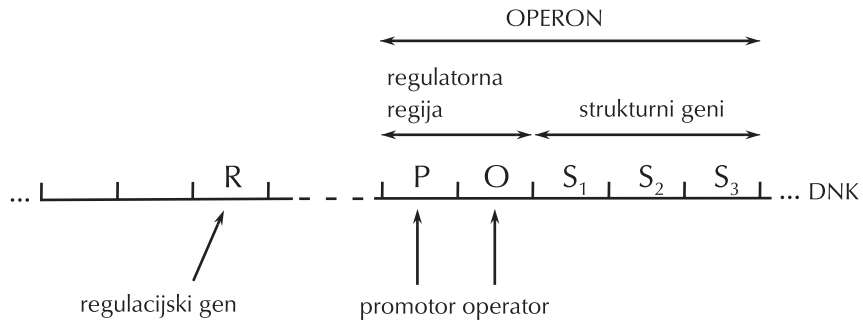
Prevajanje ali translacija



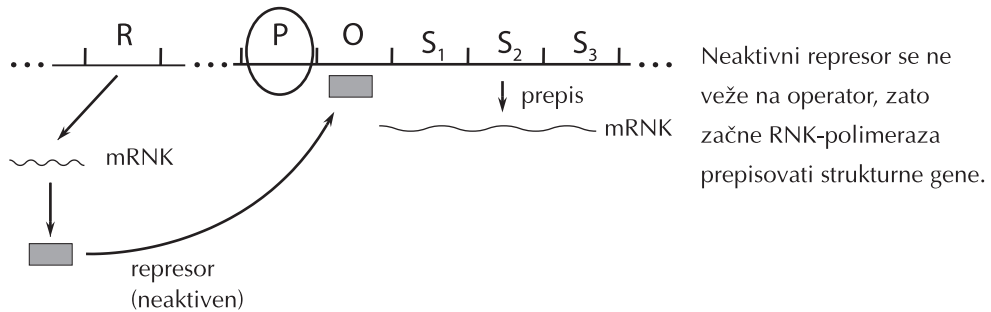
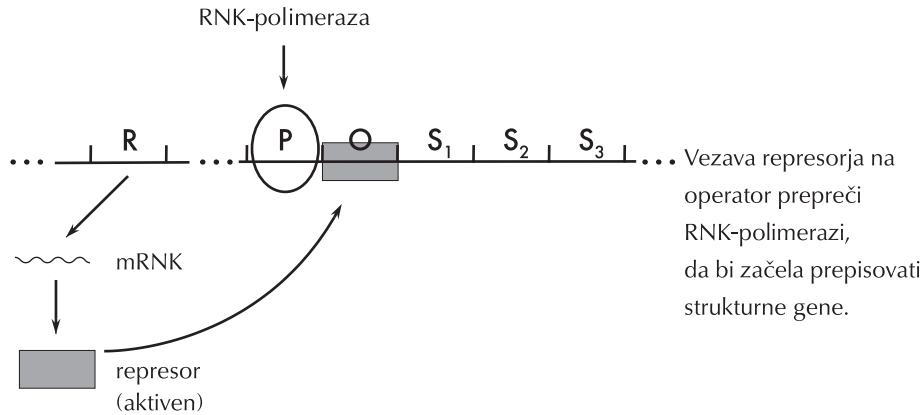
Centralna genetska dogma



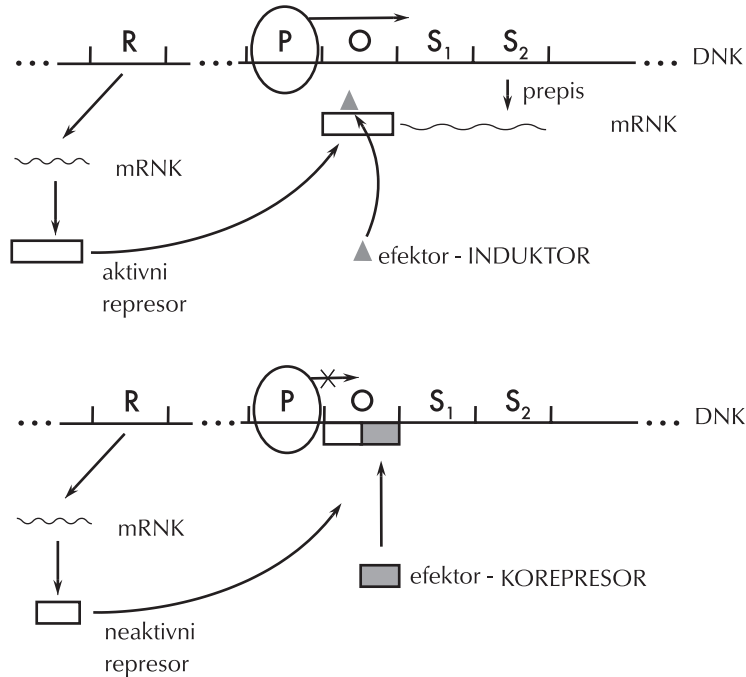
Za nastanek končnega produkta je običajno potrebnih več encimov.



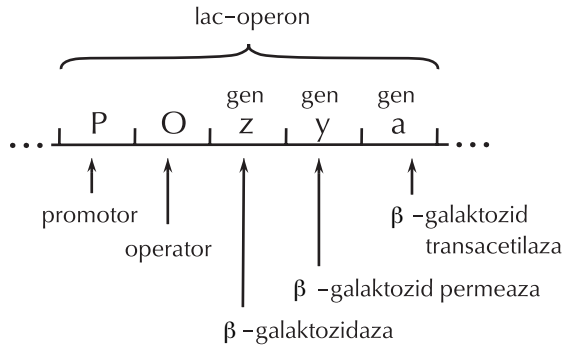
Zgradba operona



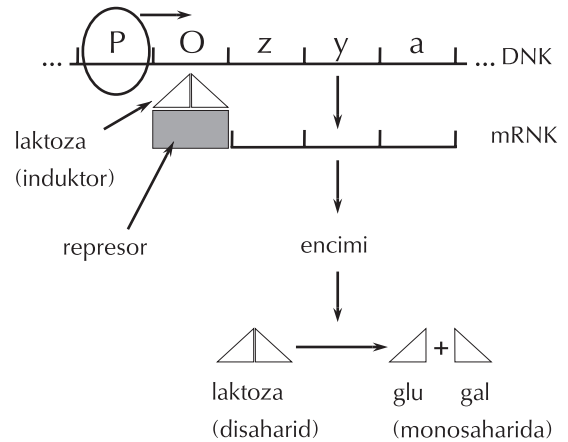
Posledice delovanja različnih vrst represorjev; zgoraj – aktivni represor prepreči prepisovanje, spodaj – neaktivni represor omogoči prepisovanje



Regulacija izražanja genov; zgoraj – efektor induktor (npr. laktoza) inaktivira aktivni represor in s tem sproži prepisovanje strukturnih genov, spodaj – efektor korepresor (npr. triptofan) aktivira neaktivni represor in s tem prepreči prepisovanje strukturnih genov.



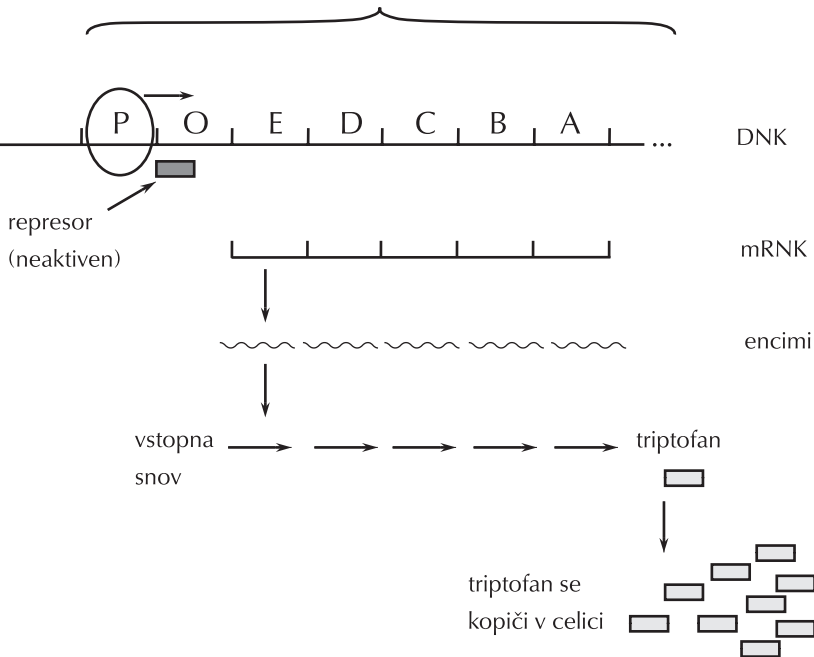
Celica ima na voljo laktozo, zato prepisuje gene za razgradnjo laktoze.



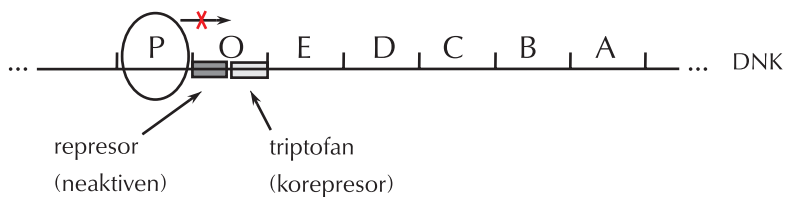
Laktozni operoni; levo - zgradba lac-operona, desno - regulacija lac-operona

trp-operon

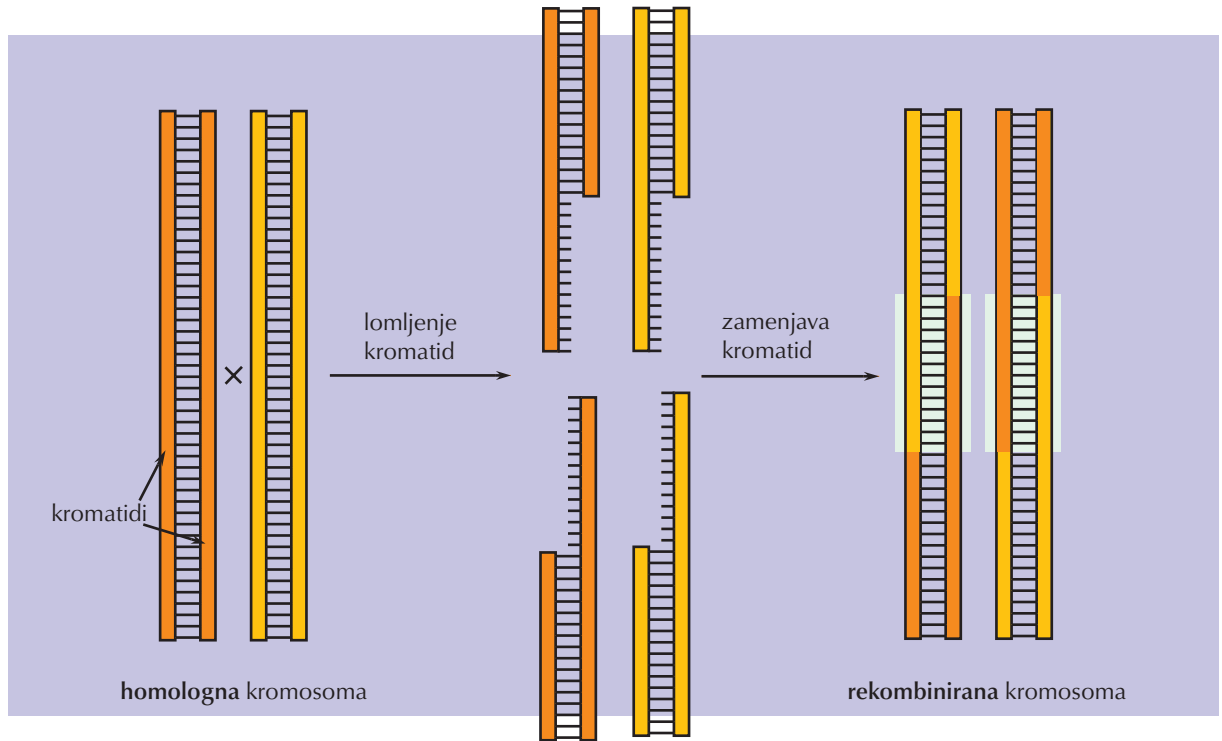
Celica izdeluje
aminokislino
triptofan, kadar
je ni v okolju. ...



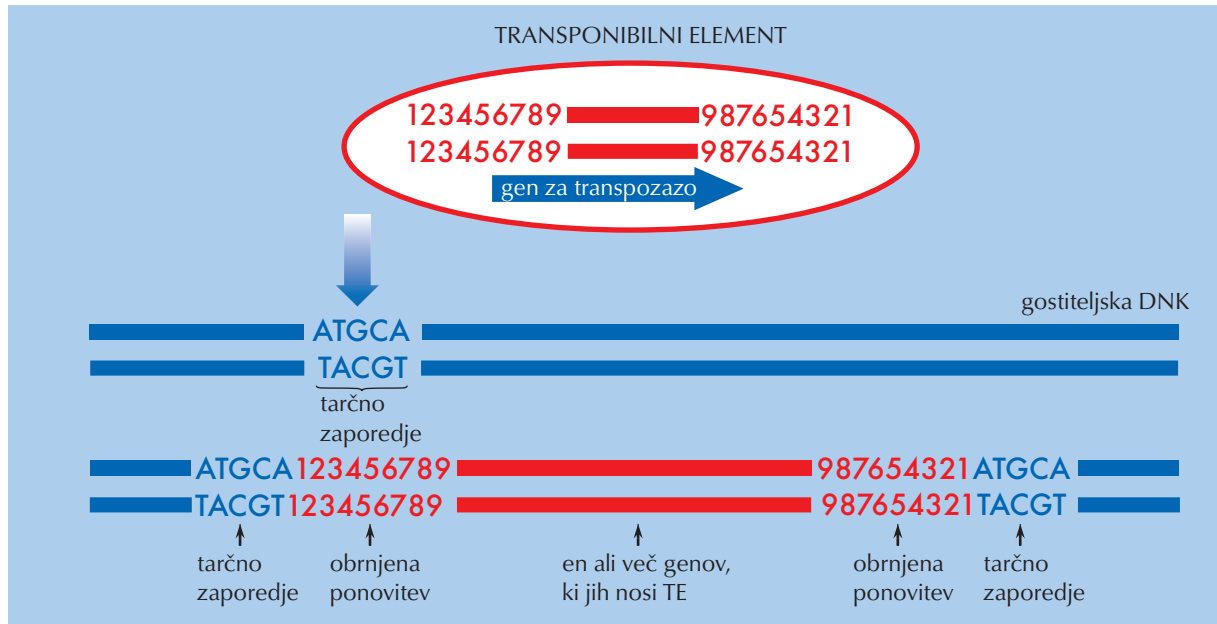
Veliko triptofana
zavre prepisovanje
trp-operona.
Triptofan aktivira
neaktivni represor.



Triptofanski operon; zgoraj - vključen trp-operon, spodaj - izključen trp-operon



Intrakromosomska (homologna) rekombinacija

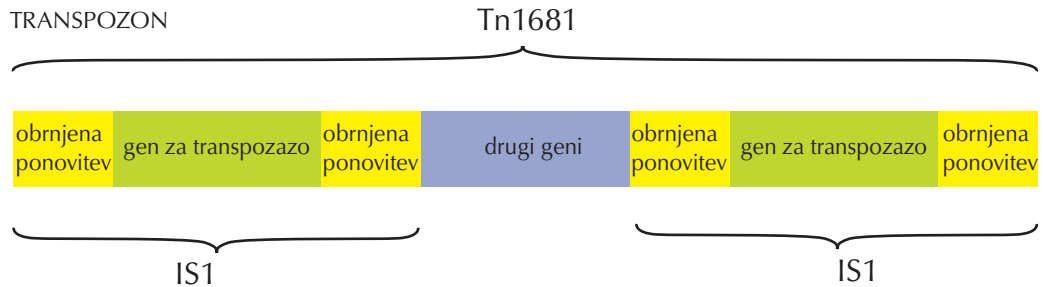


Transponibilni element (TE) ima na obeh koncih obrnjene ponovitvi. Ko se vrine v DNK na t. i. tarčno zaporedje, povzroči podvojitve tega mesta. Tarčno zaporedje je običajno dolgo od 5 do 9 baznih parov (bp). Na sliki je tarčno zaporedje zgrajeno iz 5 baznih parov. TE ima na koncih obrnjene ponovitvi iz zaporedja 9 baznih parov, ki so na skici označeni s številkami. Številke od 1 do 9 predstavljajo določeni bazni par. Podvojeni tarčni zaporedji sta enosmerni, vsakič drugačni in nista del TE.

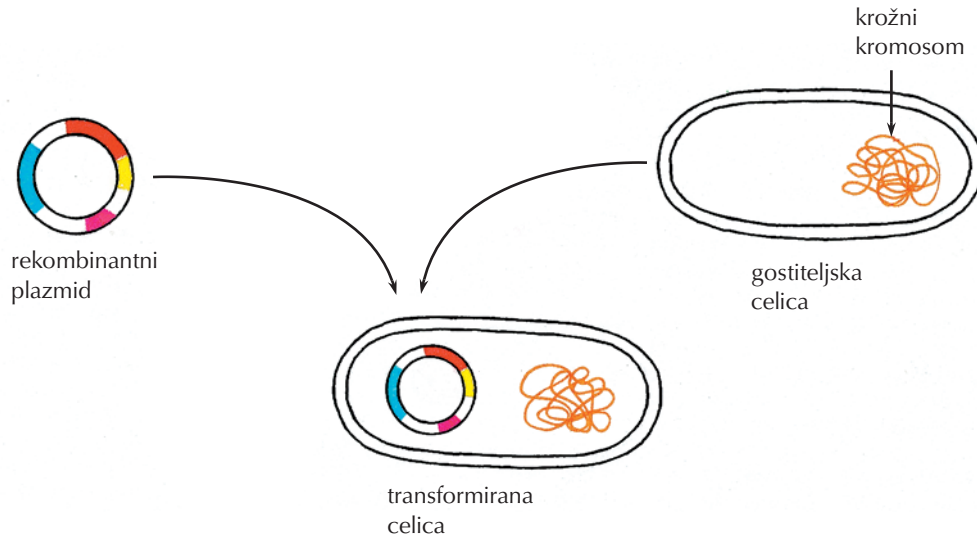
INSERCIJSKO ZAPOREDJE



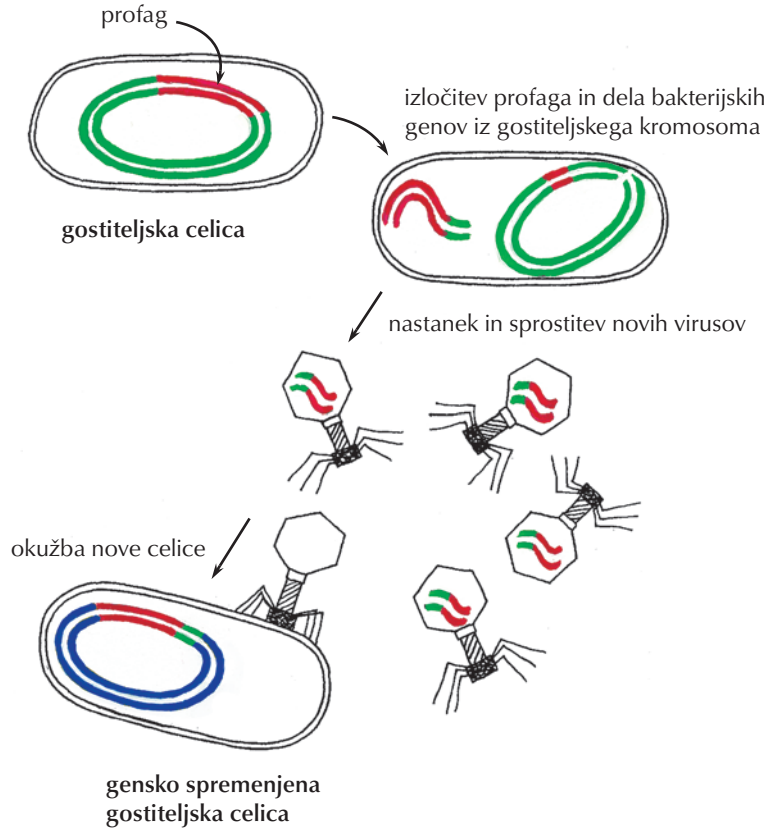
TRANSPOZON



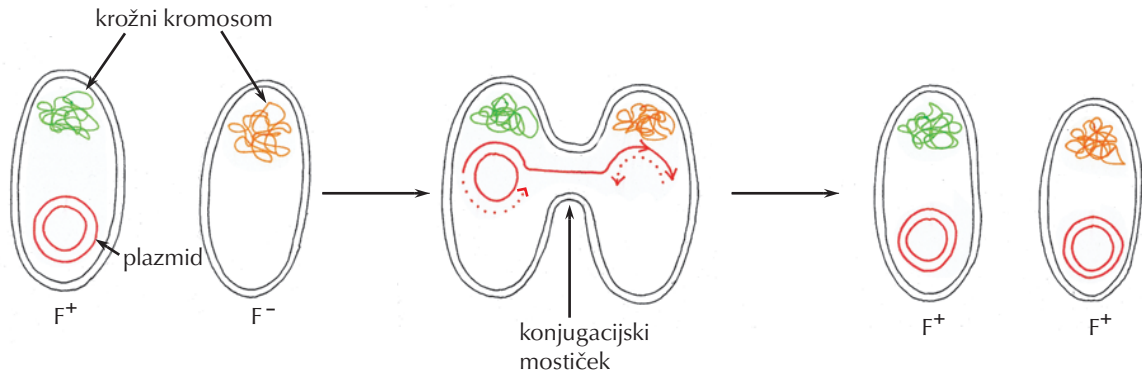
Vrste transponibilnih elementov; zgoraj – insercijska zaporedja (IS), spodaj – transpozon (Tn)



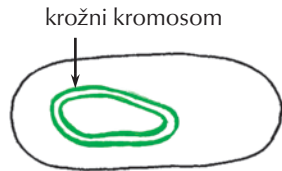
Transformacija



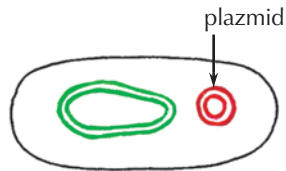
Transdukcija



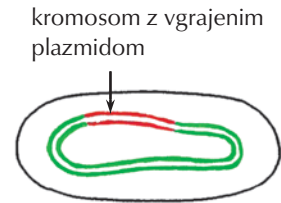
Konjugacija



F⁻ celica

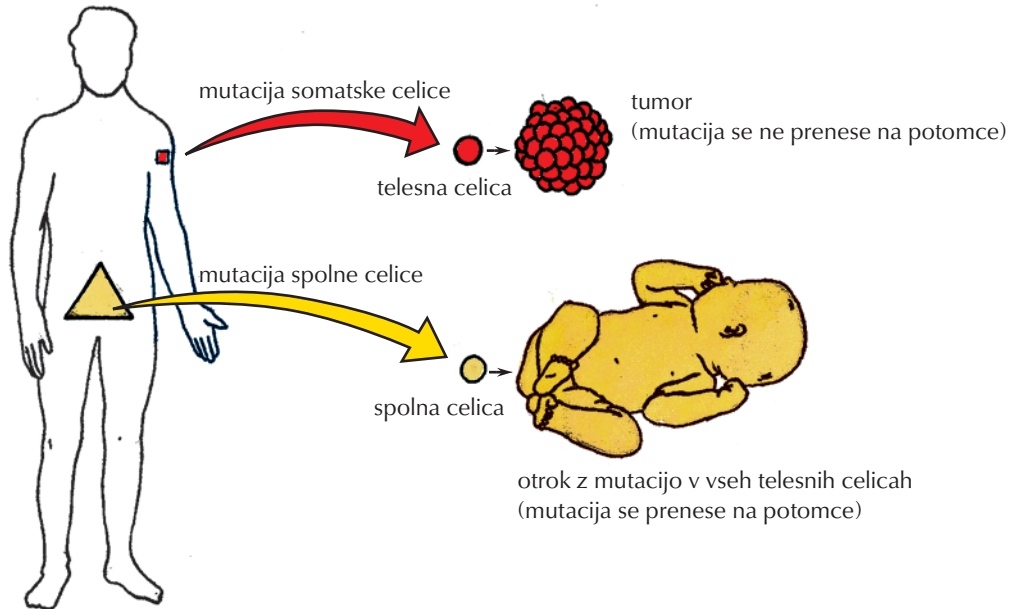


F⁺ celica

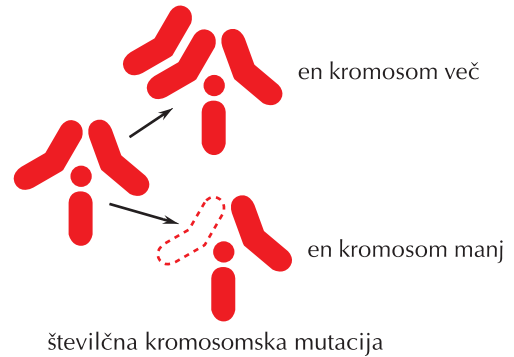
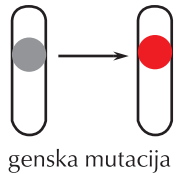


Hfr celica

Oznake bakterij, ki sodelujejo pri konjugaciji.

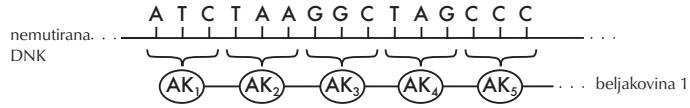


Posledice somatskih in zarodnih mutacij

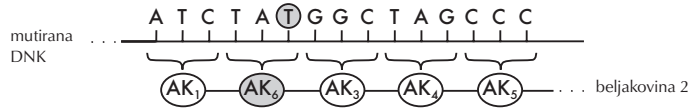


Genske, kromosomske in številčne kromosomske mutacije

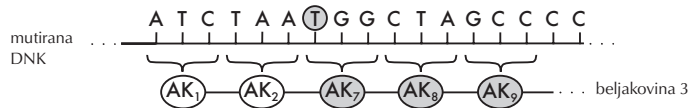
MOLEKULSKA GENETIKA



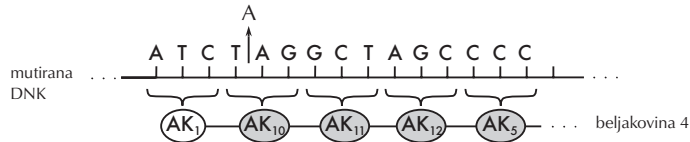
zamenjava enega nukleotida (A → T)



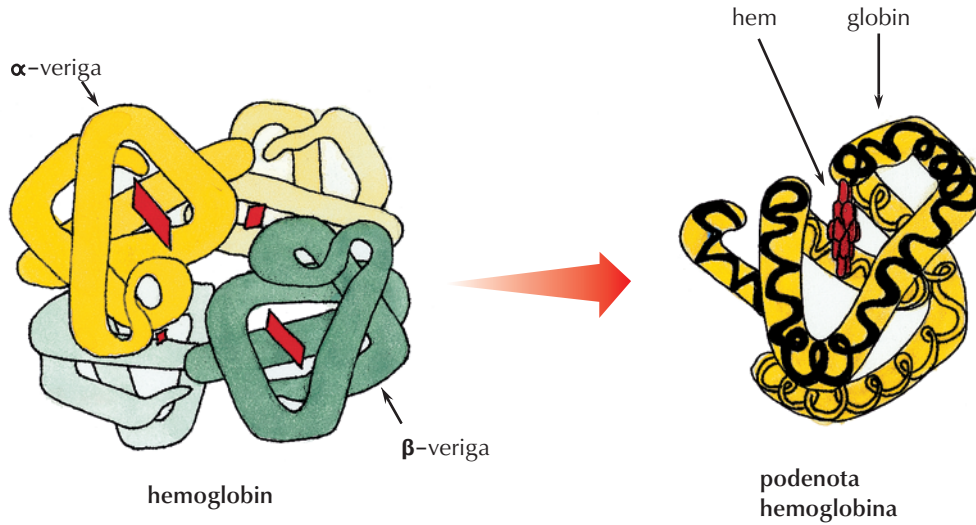
vrinjenje enega nukleotida (T)



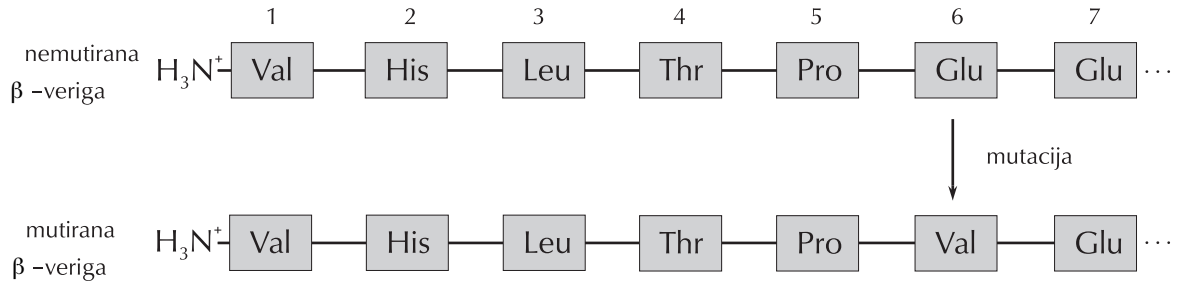
izpad enega nukleotida (A)



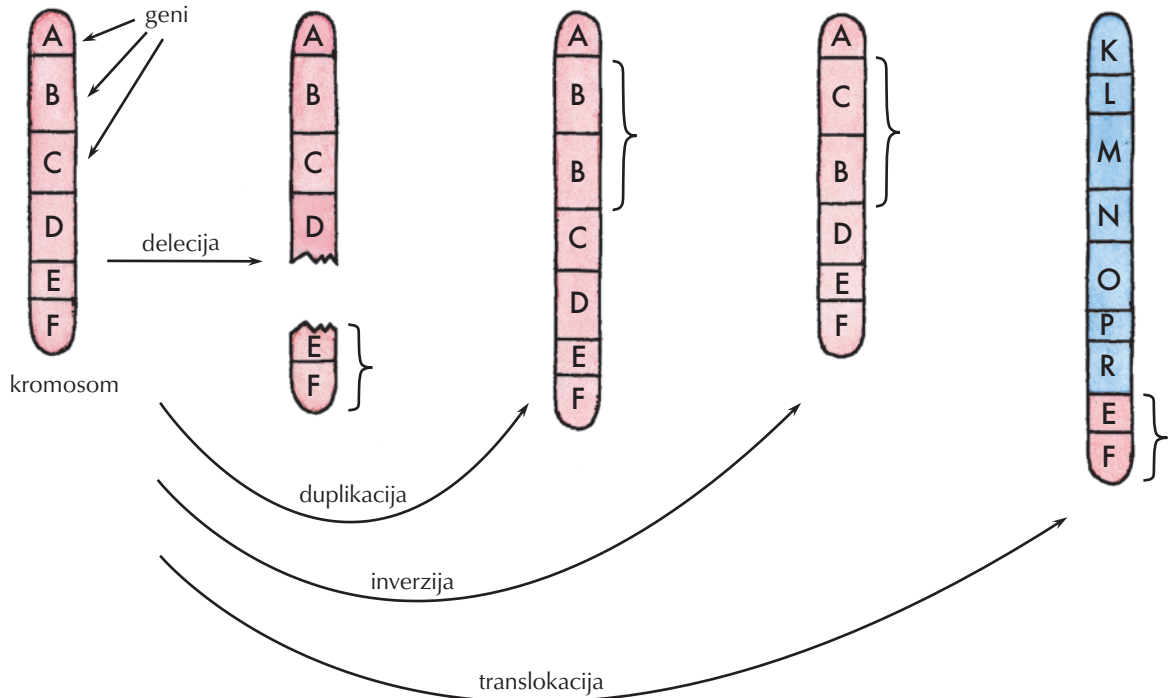
Vzroki za genske mutacije in njihove posledice



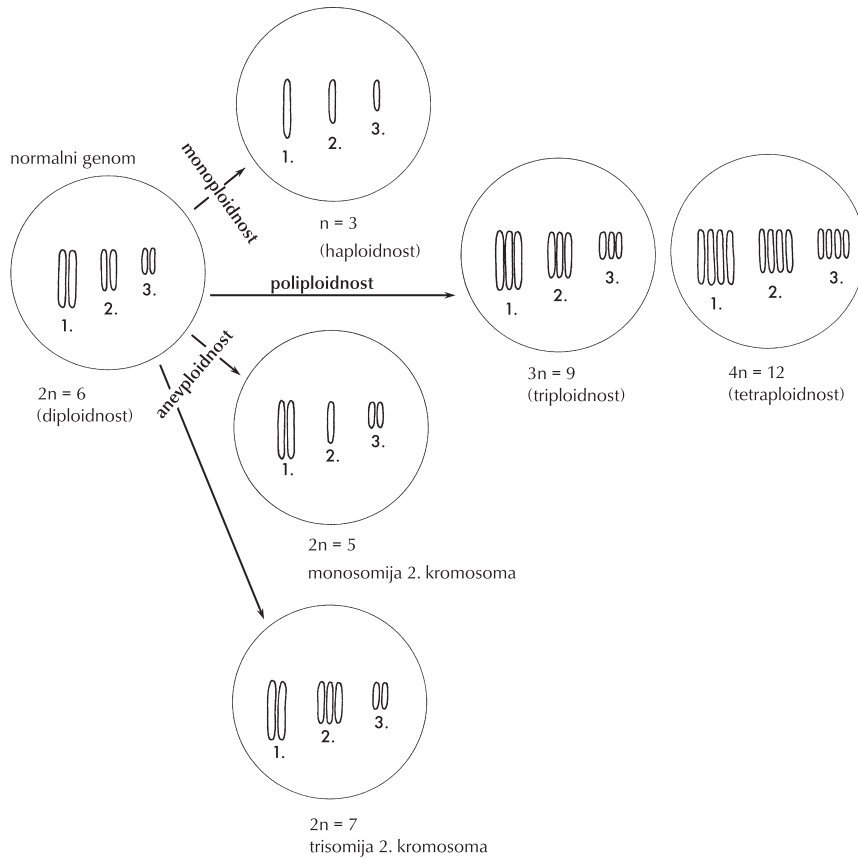
Zgradba hemoglobina



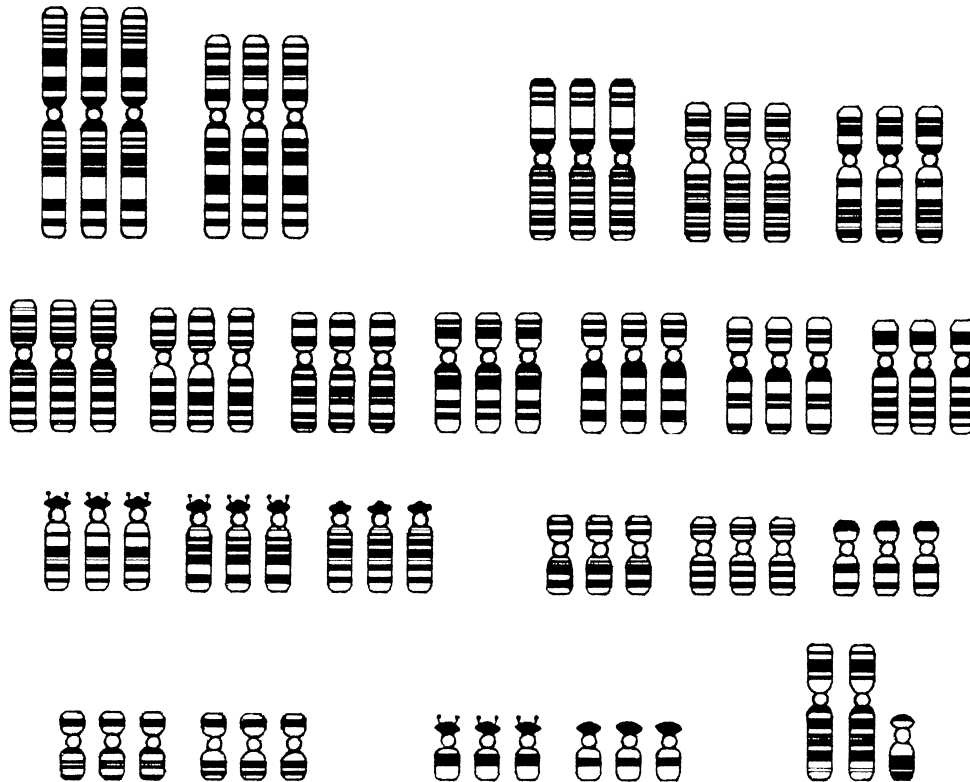
Del nemutirane in mutirane β -verige



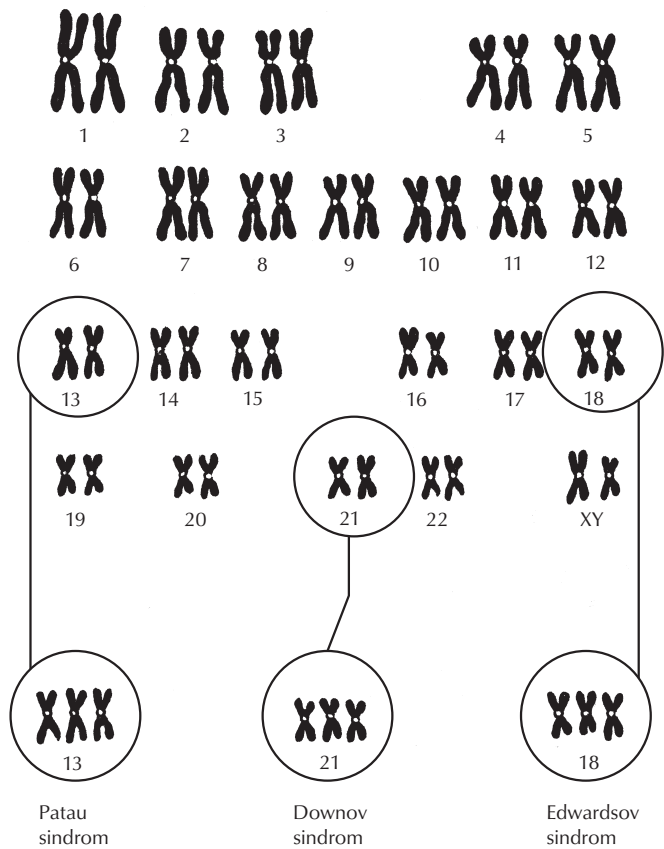
Strukturne kromosomske mutacije



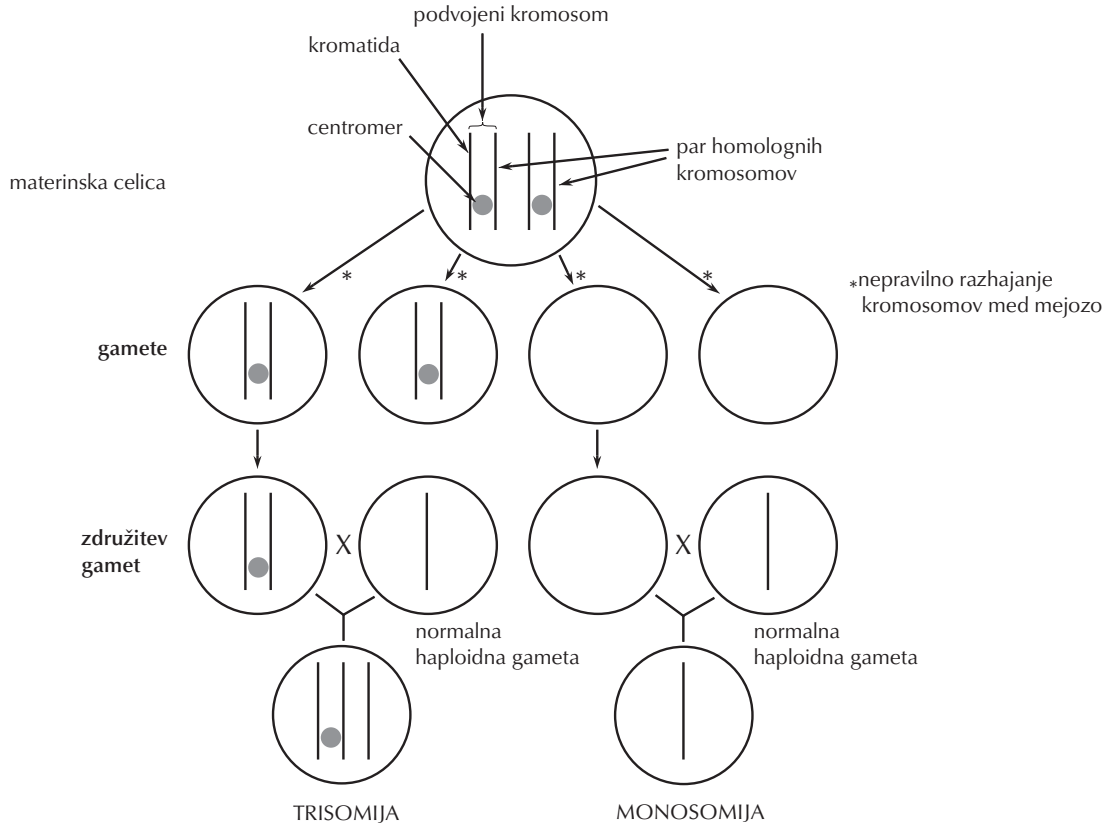
Prikaz monoploidne, poliploidne in aneuploidne (monosomija, trisomija) celice



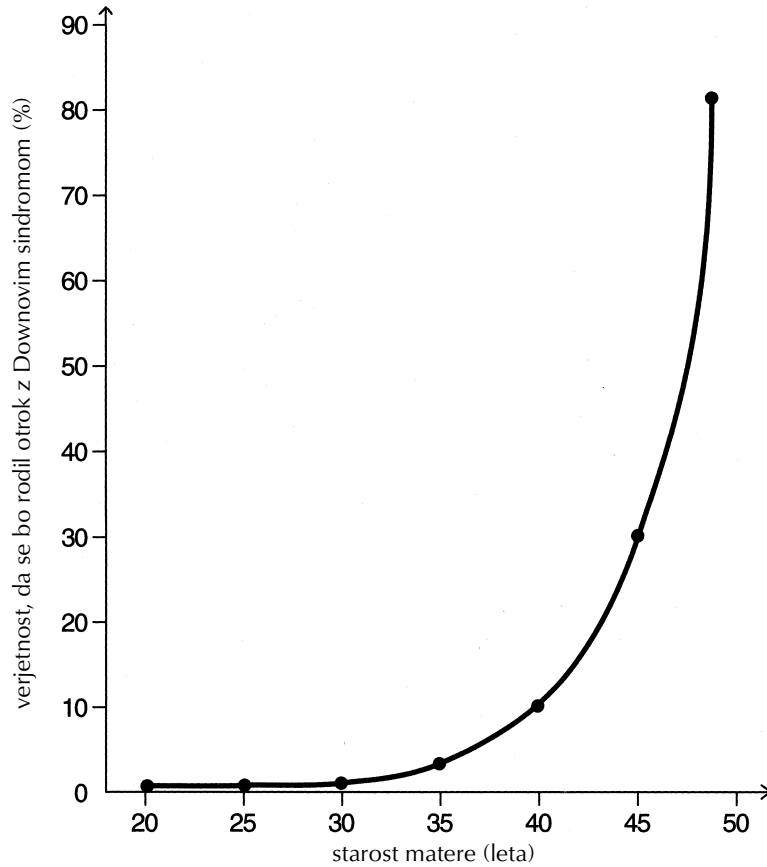
Shematski prikaz idiograma s triploidijo ($3n$)



Trisomije



Nepravilno razdvajanje kromosomov med mejozo



S starostjo matere narašča verjetnost, da bo rodila otroka z Downovim sindromom.