

Изучение генетической структуры популяции

Внешние различия



Cepaea nemoralis

Внешние различия

ФЕНОТИП \neq ГЕНОТИП

Cerpea nemoralis

Внешние различия

Фенотип \neq Генотип

«Скрытое» разнообразие

Cepaea nemoralis

Модели популяции

Классическая

AA BB CC DD Ee FF GG

vs

Балансовая

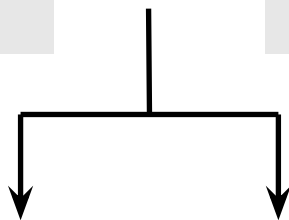
Aa BB Cc Dd Ee Ff Gg

«Скрытая» изменчивость

P



X



F1



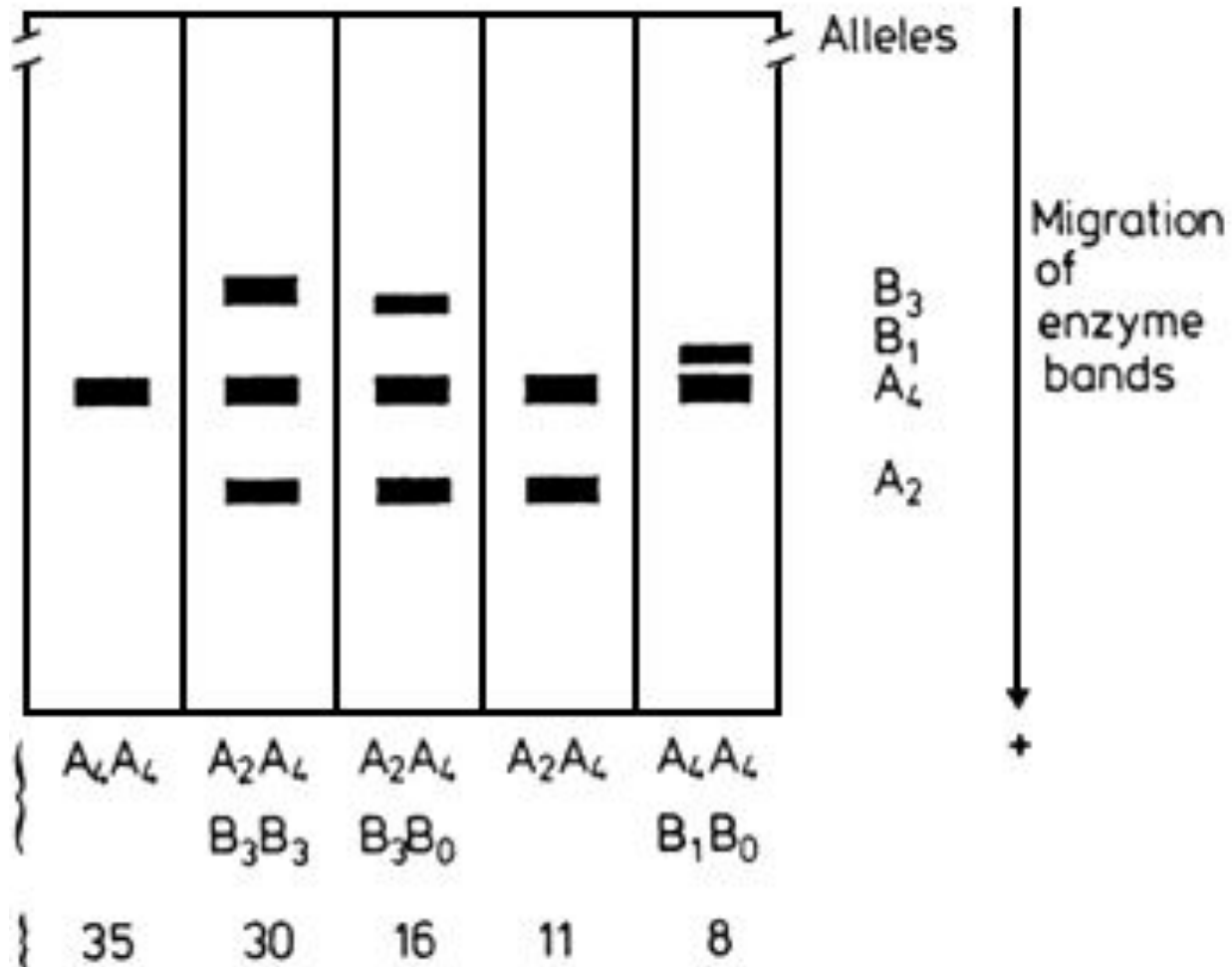
X



Изоферменты

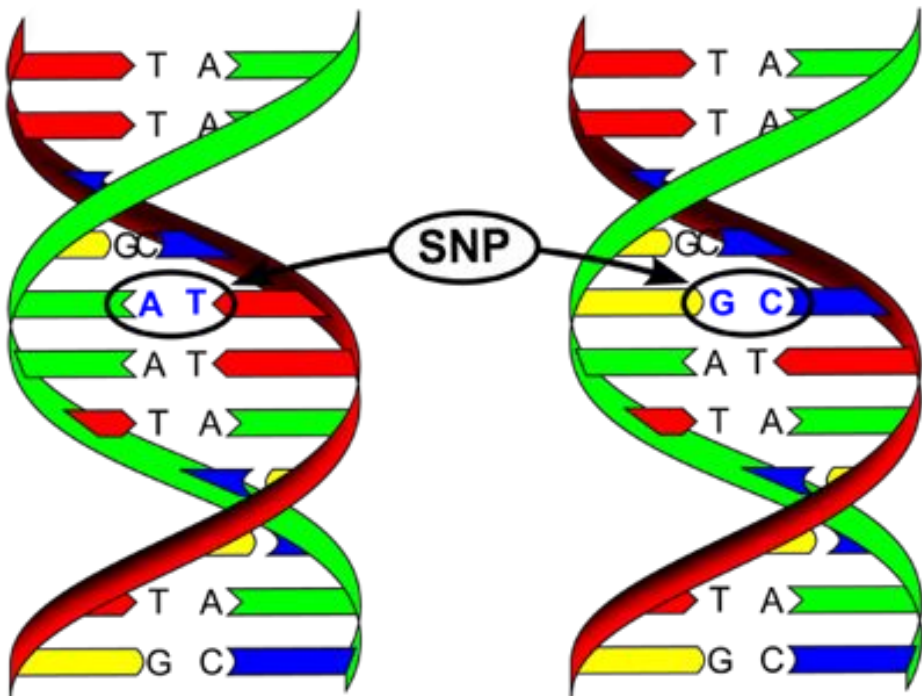
Number of isozyme patterns

1 5 6 14 15



Однонуклеотидные полиморфизмы (SNP)

Замены



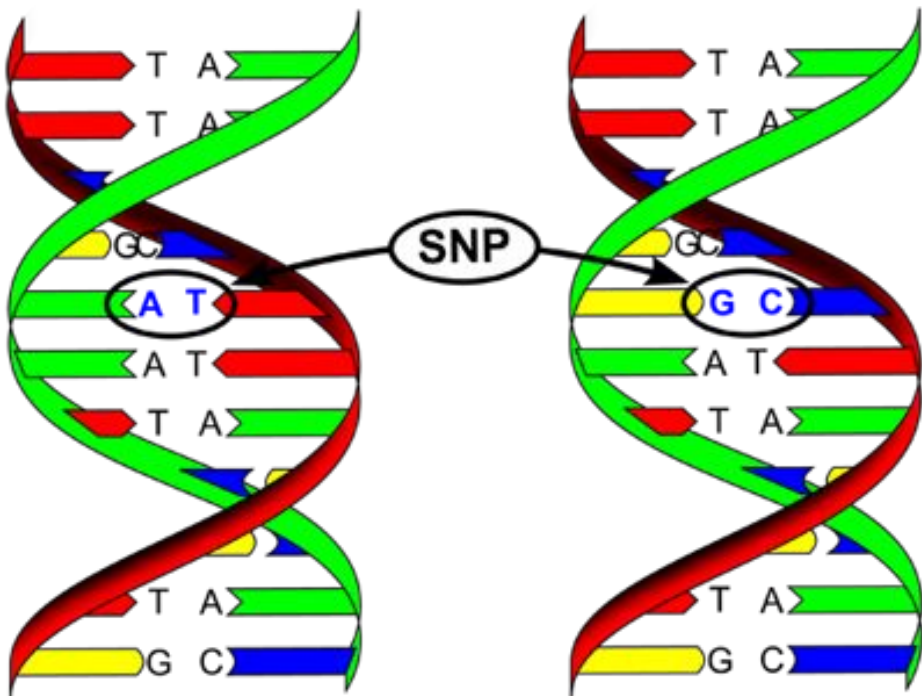
Indel

...GTAC**C**GTAC...
...CAT**G**CATG...

...GTA-GTAC...
...CAT-CATG...

Однонуклеотидные полиморфизмы (SNP)

Замены



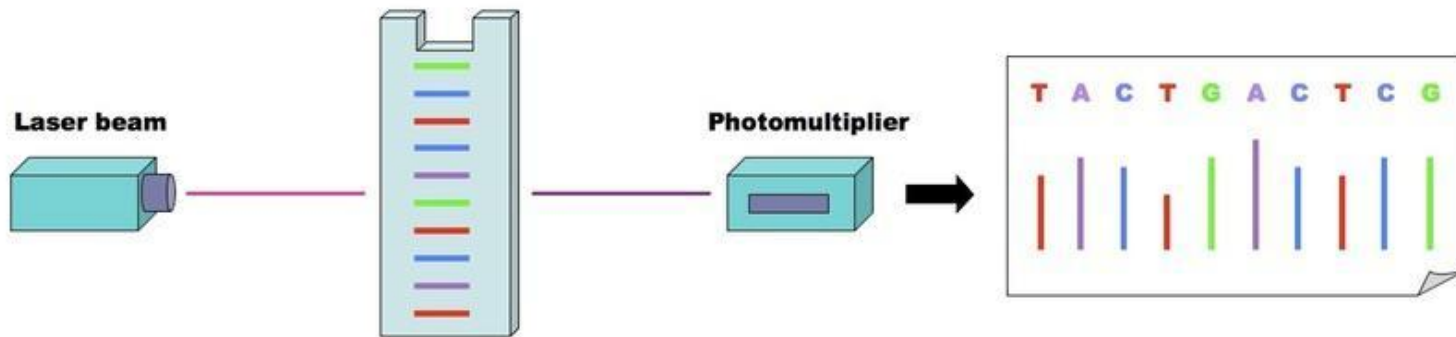
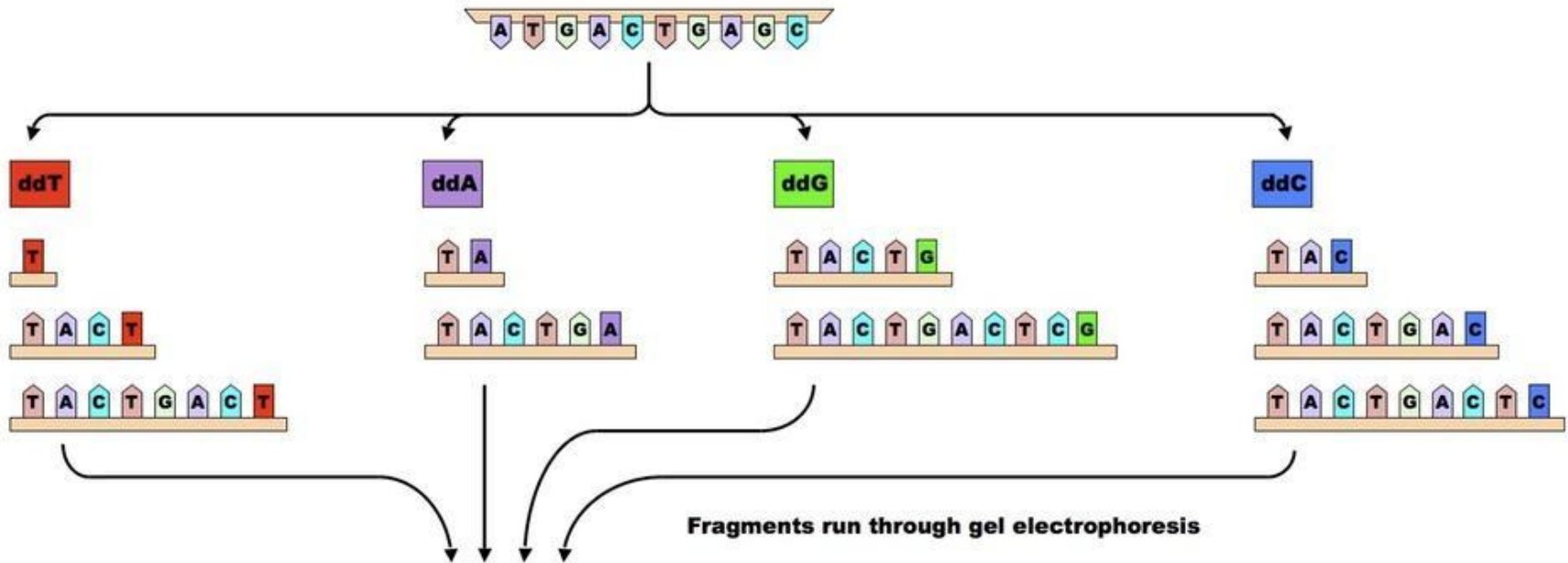
Indel

...GTAC**C**GTAC...
...CAT**G**CATG...

...GTAGTAC...
...CATCATG...

Определение последовательности ДНК

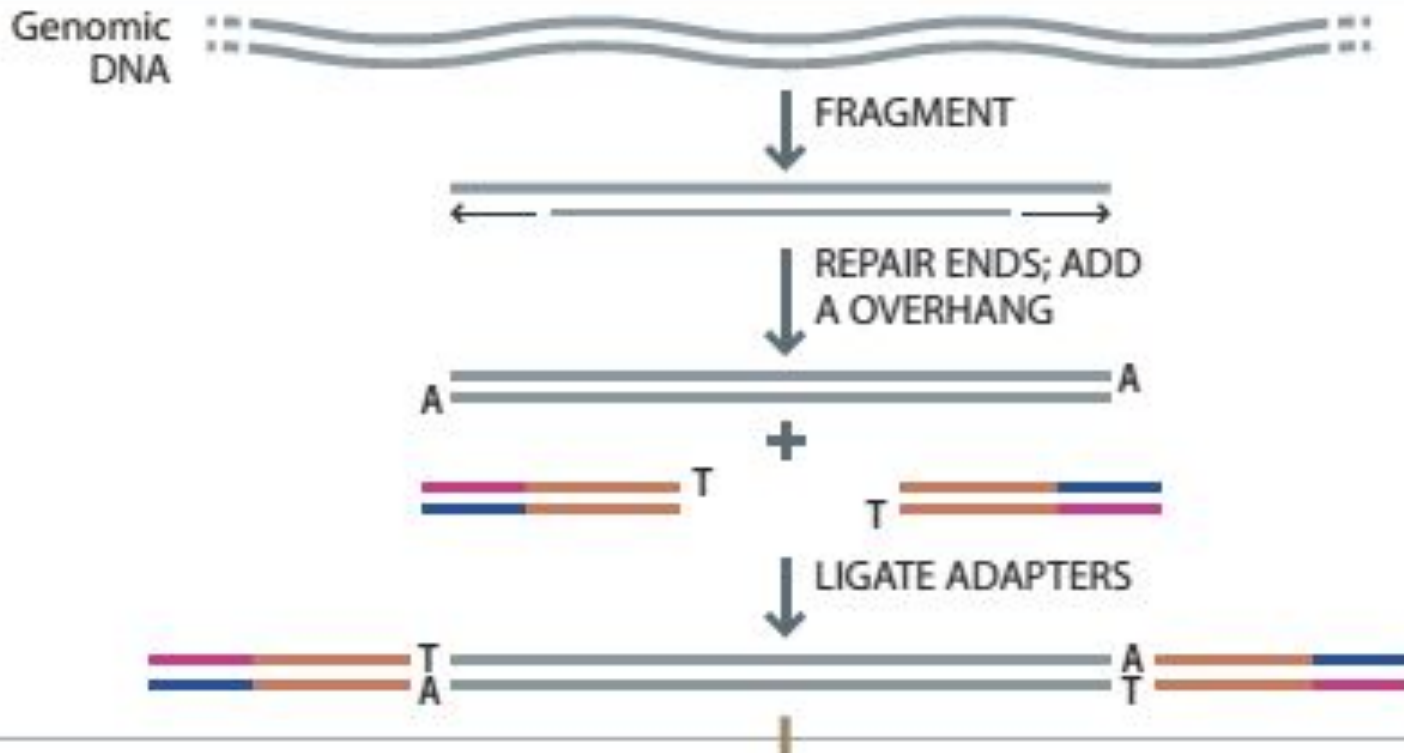
PCR in presence of fluorescent, chain-terminating nucleotides



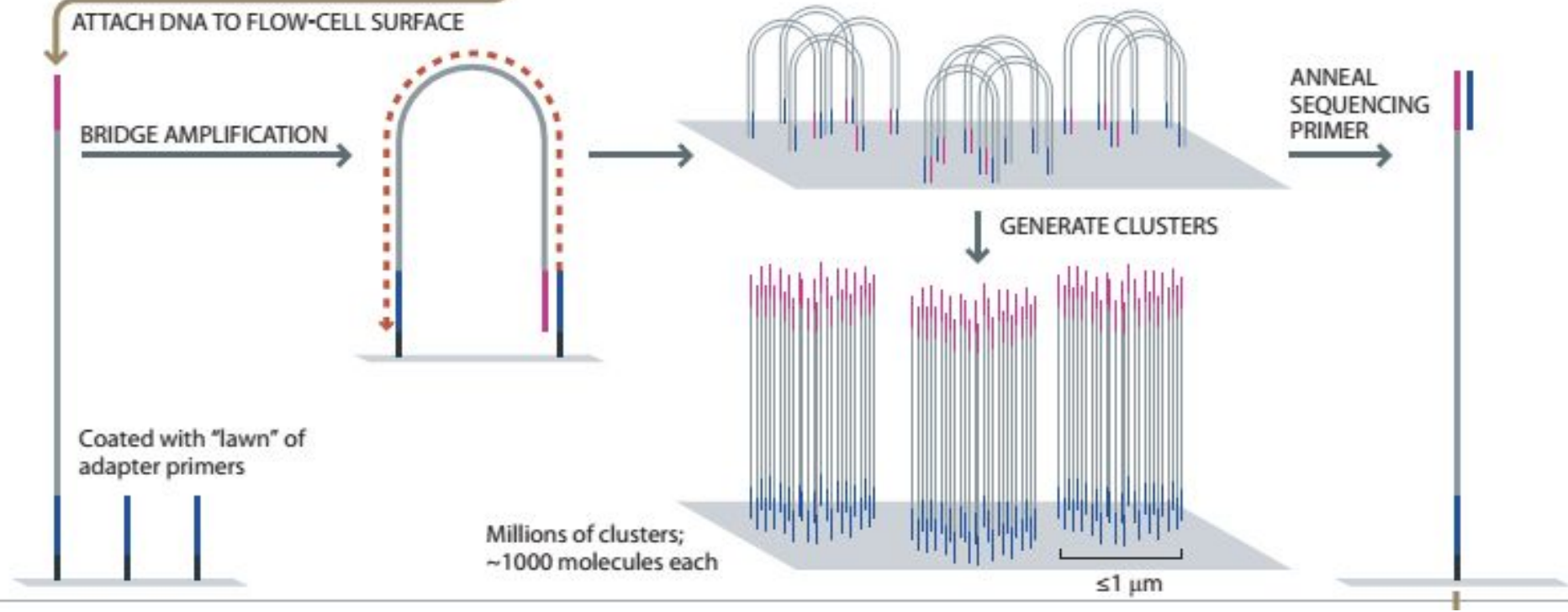
Fluorescent fragments detected by laser and represented on a chromatogram

Секвенирование нового поколения (NGS)

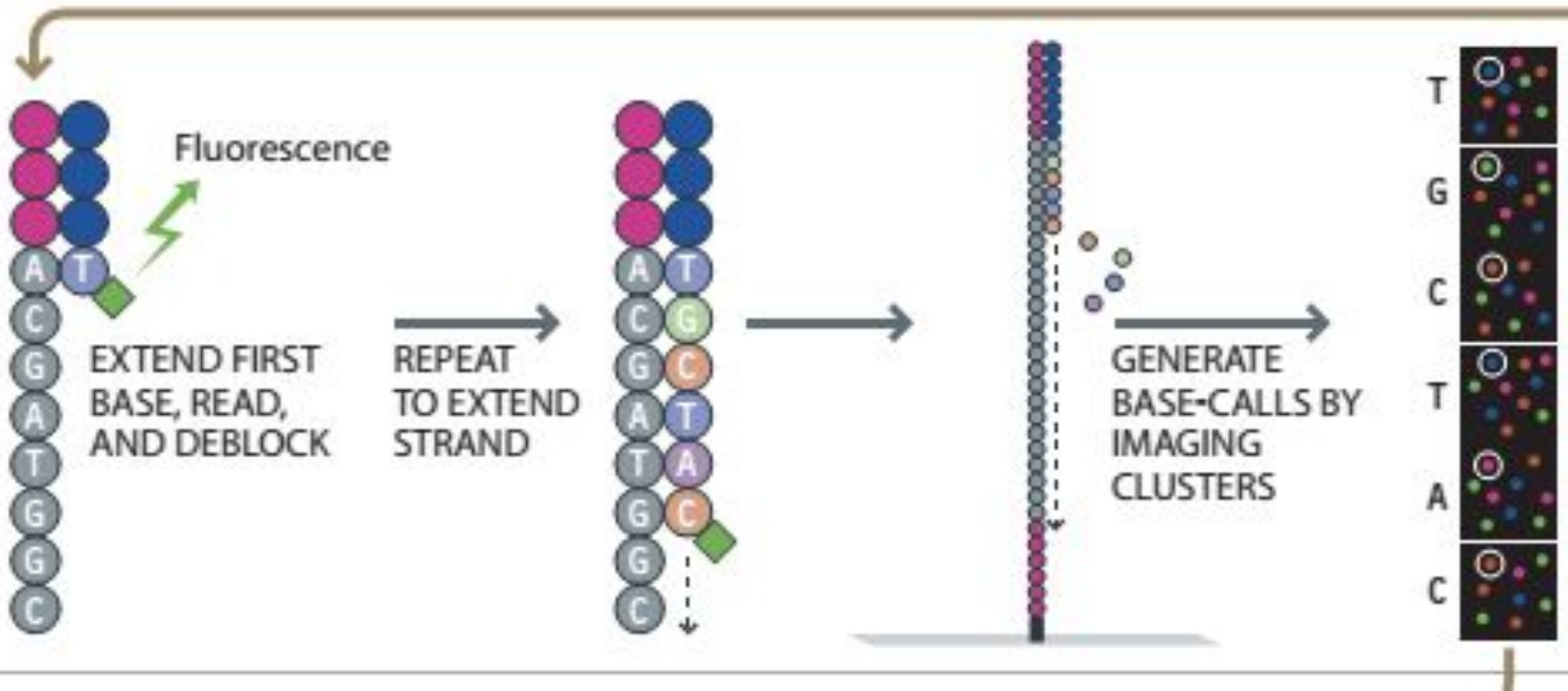
Library preparation



Cluster generation



Sequencing



Mapping

Reference
sequence

..GCTGATGTGCCGCCTCACTCCGGTGG

CACTCCGGTTGG

CTCACTCCGGTTGG

GCTGATGTGCCACCTCA

GATGTGCCACCTCACTC

GTGCCGCCTCACTCCTTG

CTCCTTTGG

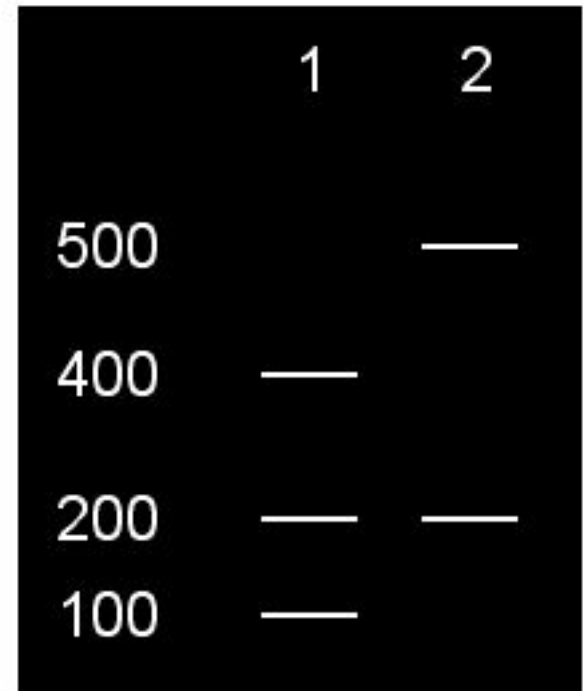
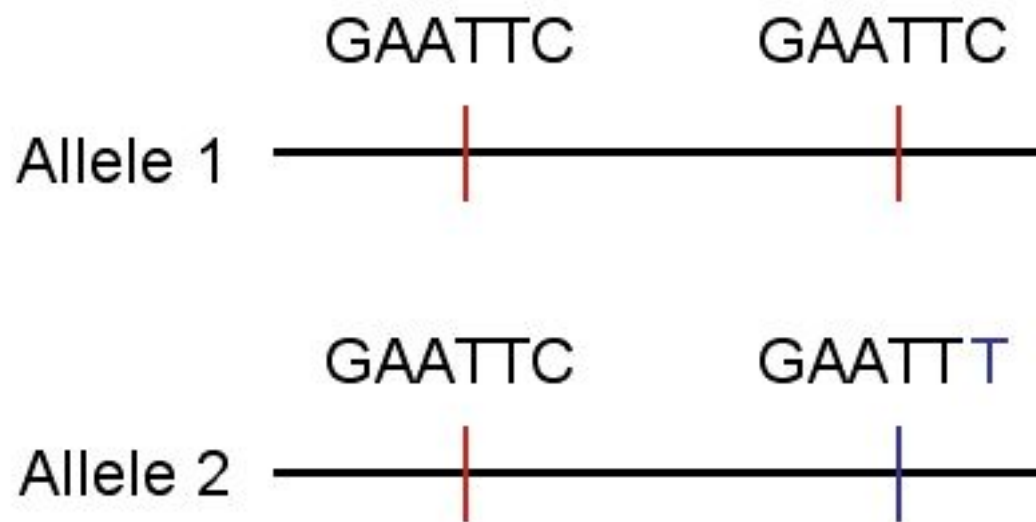
Unknown SNP

Known SNP

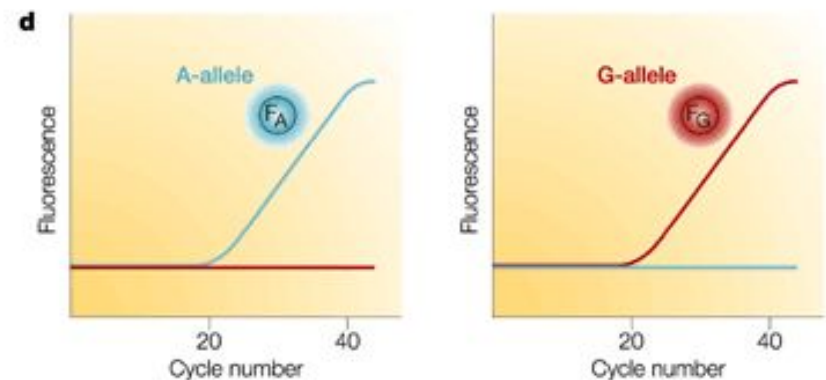
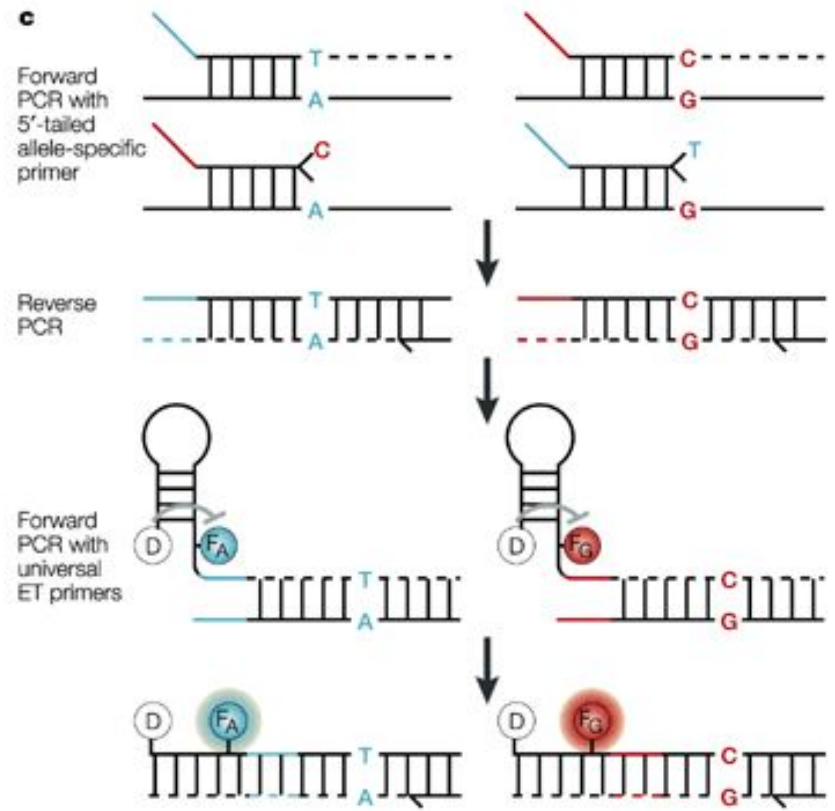
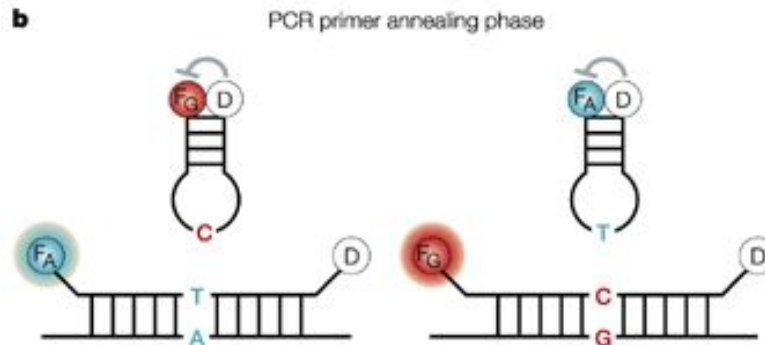
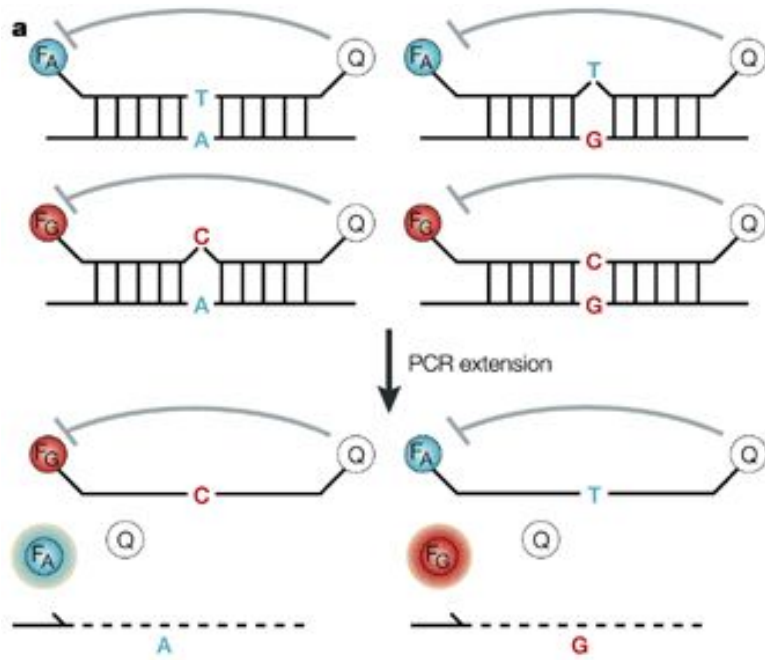
T

Restriction Fragment Length Polymorphism

700 base pair PCR fragment

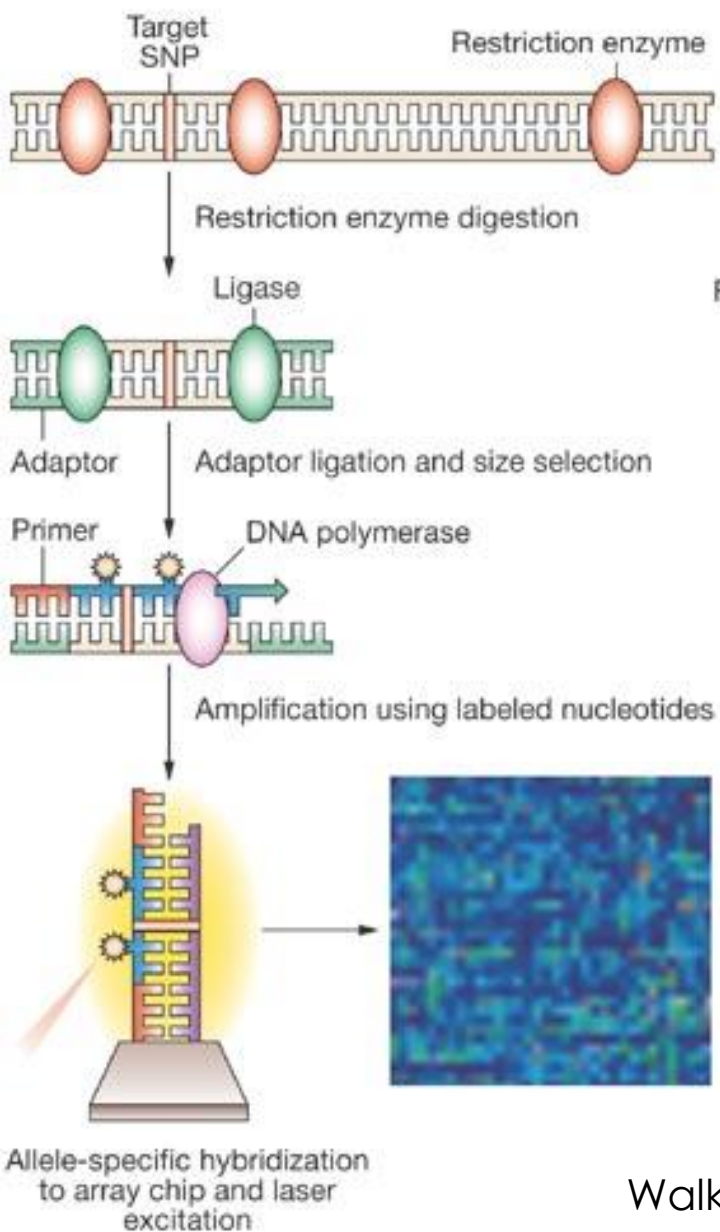


ПЦР в реальном времени (RT-PCR)

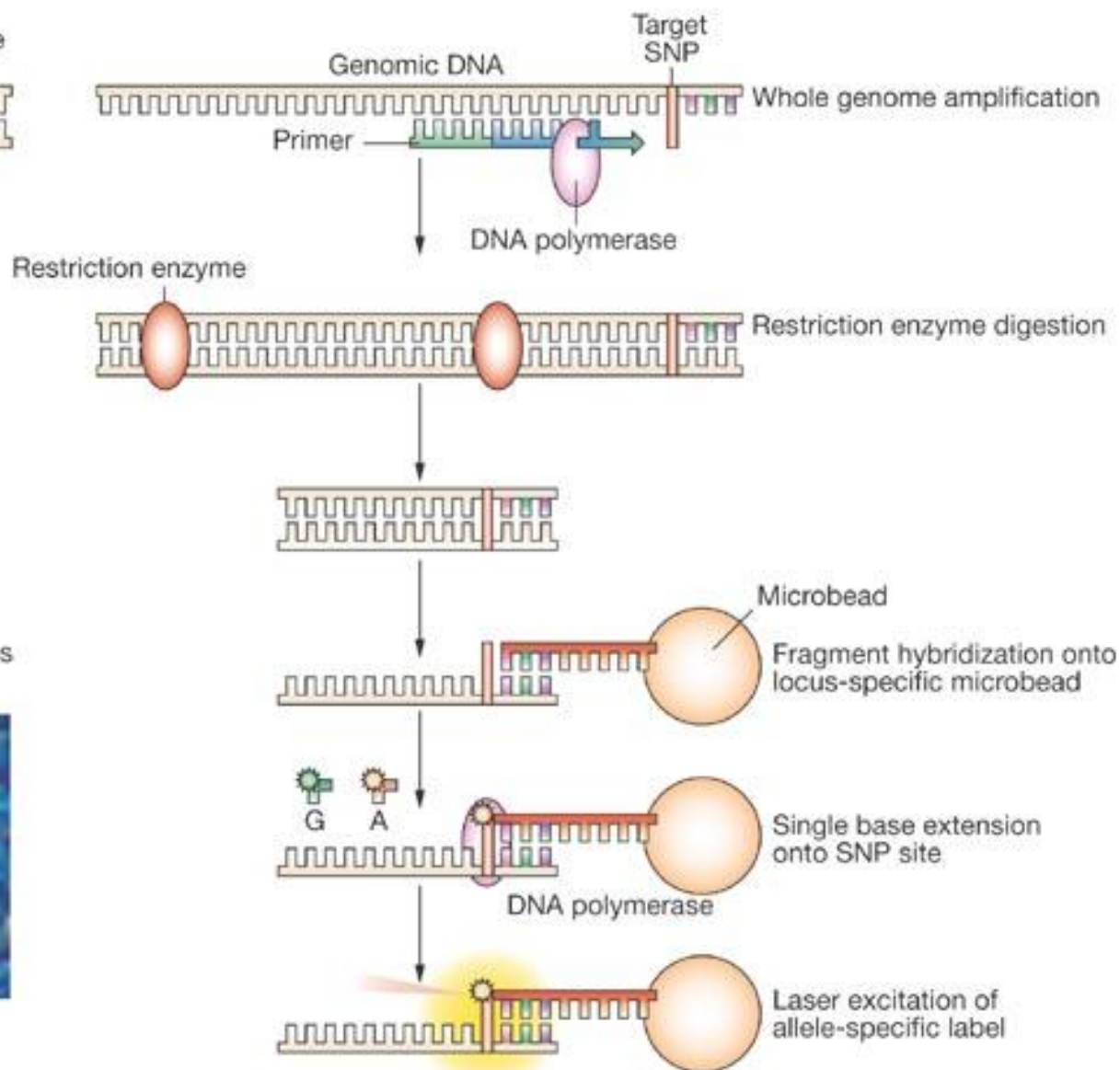


ДНК-ЧИПЫ

A Affymetrix genotype microarray



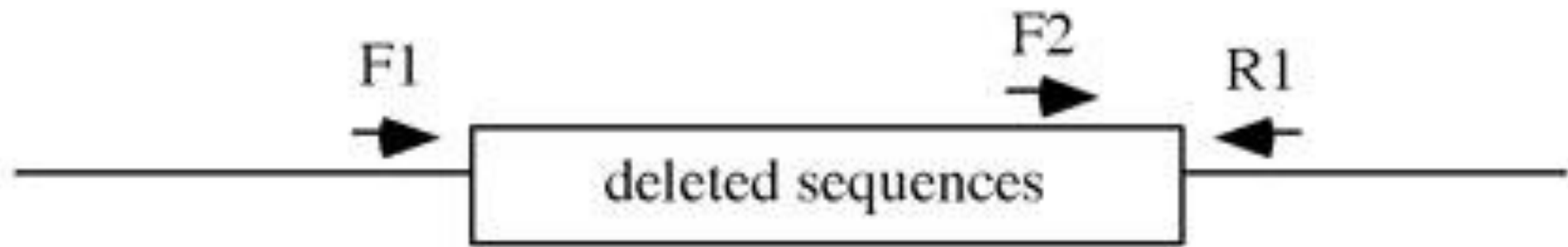
B Illumina microbead genotype system

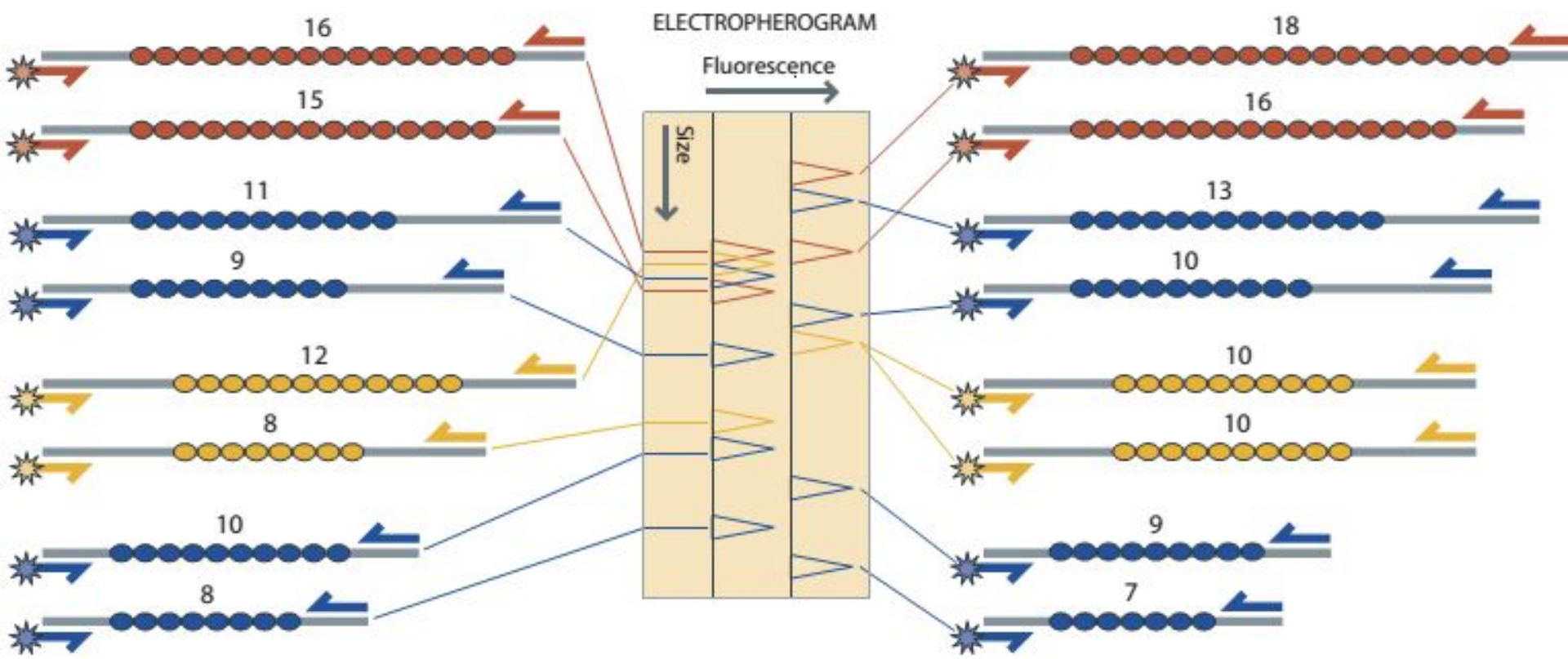


Инсерции и делеции (в т.ч. МГЭ)

...GTACATCCGTAC...
...CATGTAGGCATG...

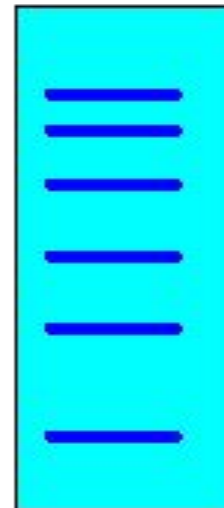
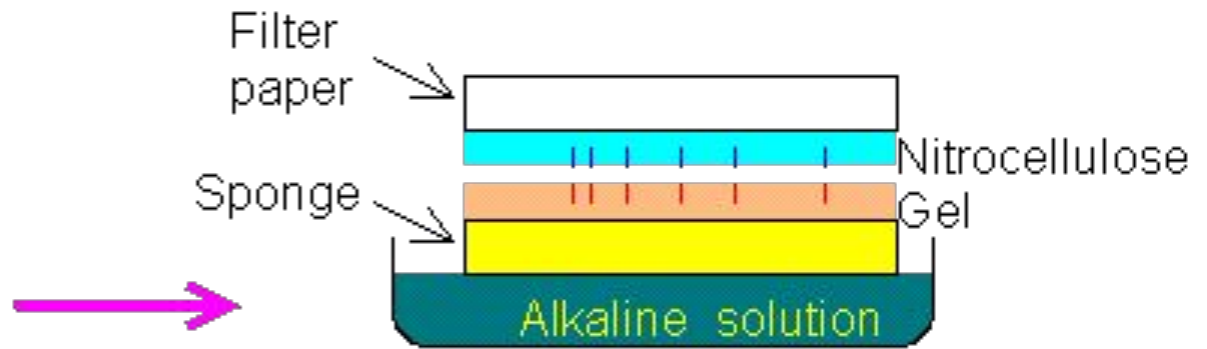
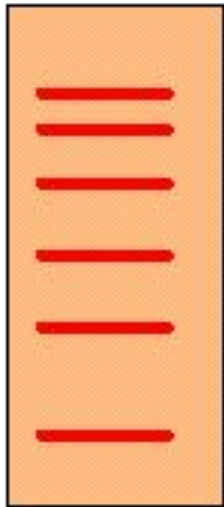
...GTA---CGTAC...
...CAT---GCATG...





Key	
	Dye-1-labeled primer
	Dye-2-labeled primer
	Dye-3-labeled primer
	Repeat unit of tetranucleotide microsatellite

Gel electrophoresis



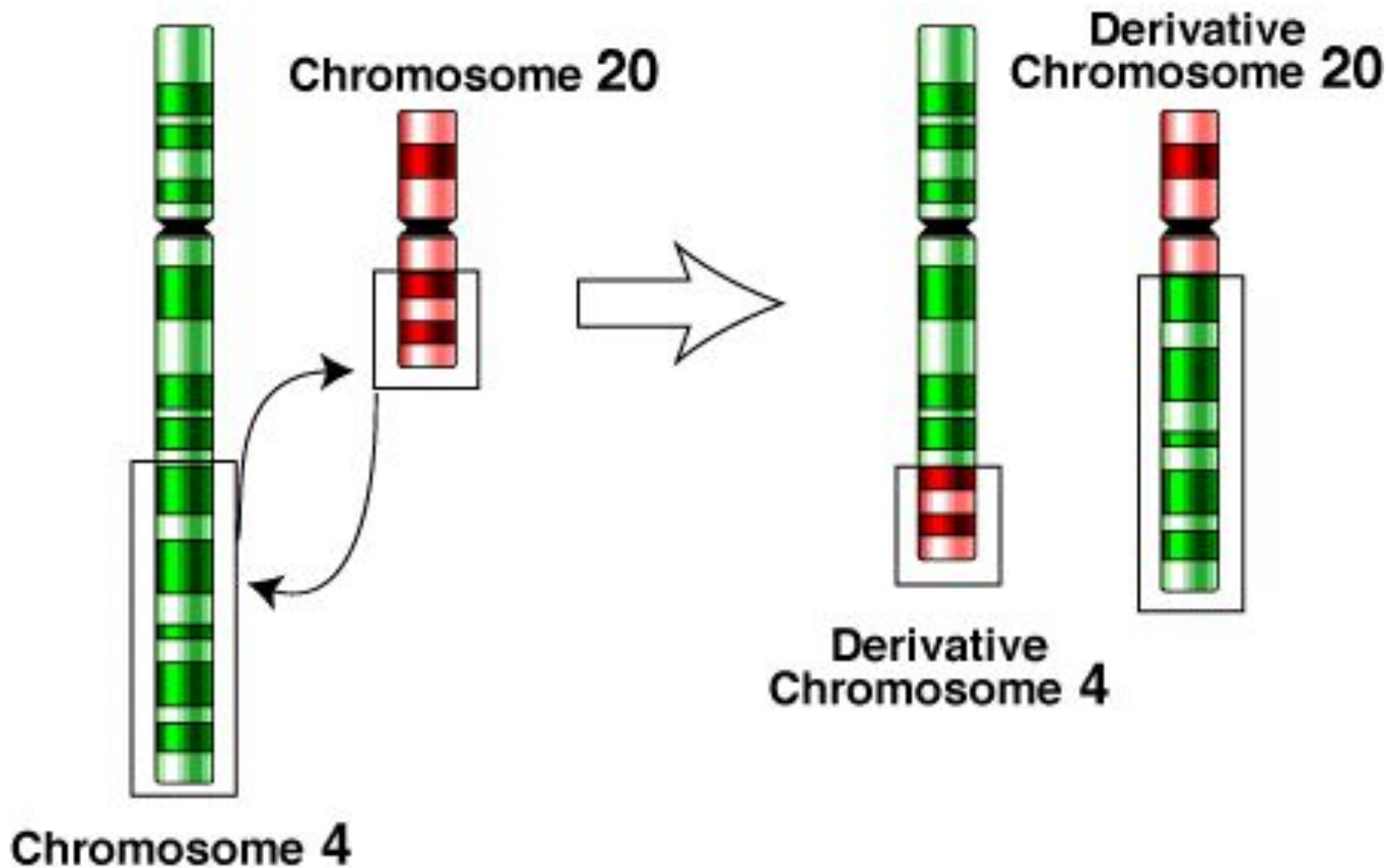
Hybridize
with probe



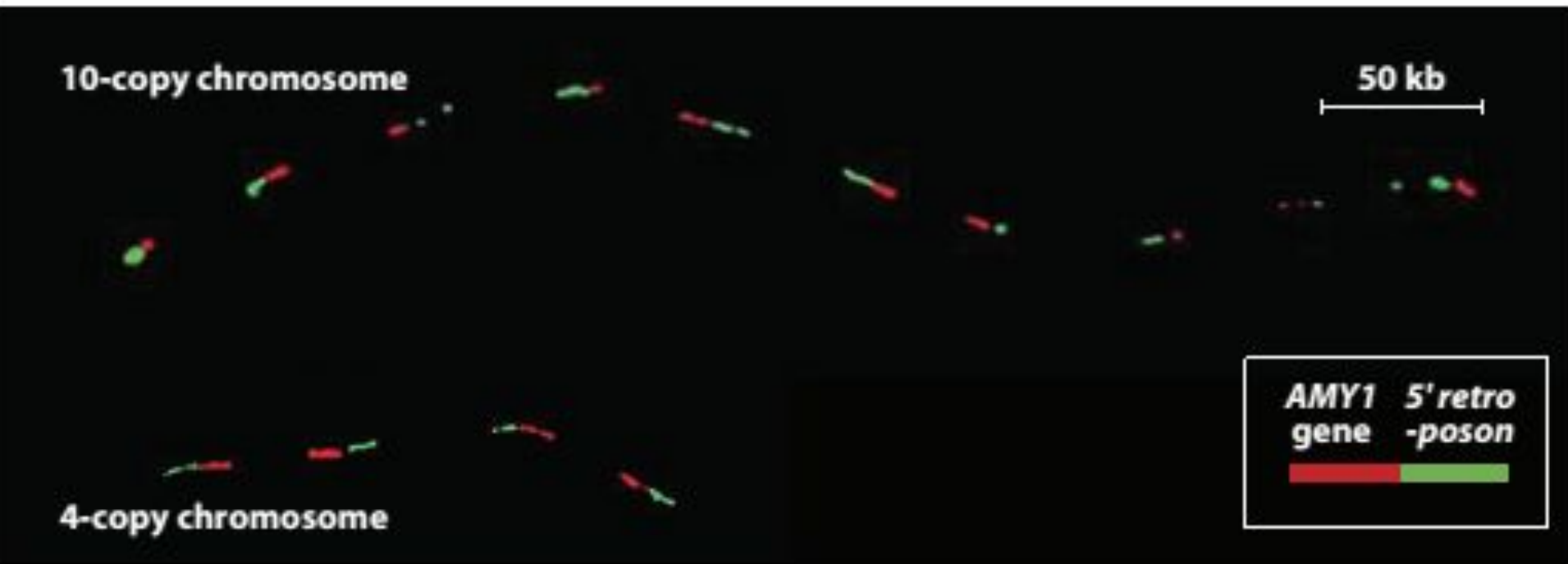
Autoradiogram

Nitrocellulose filter

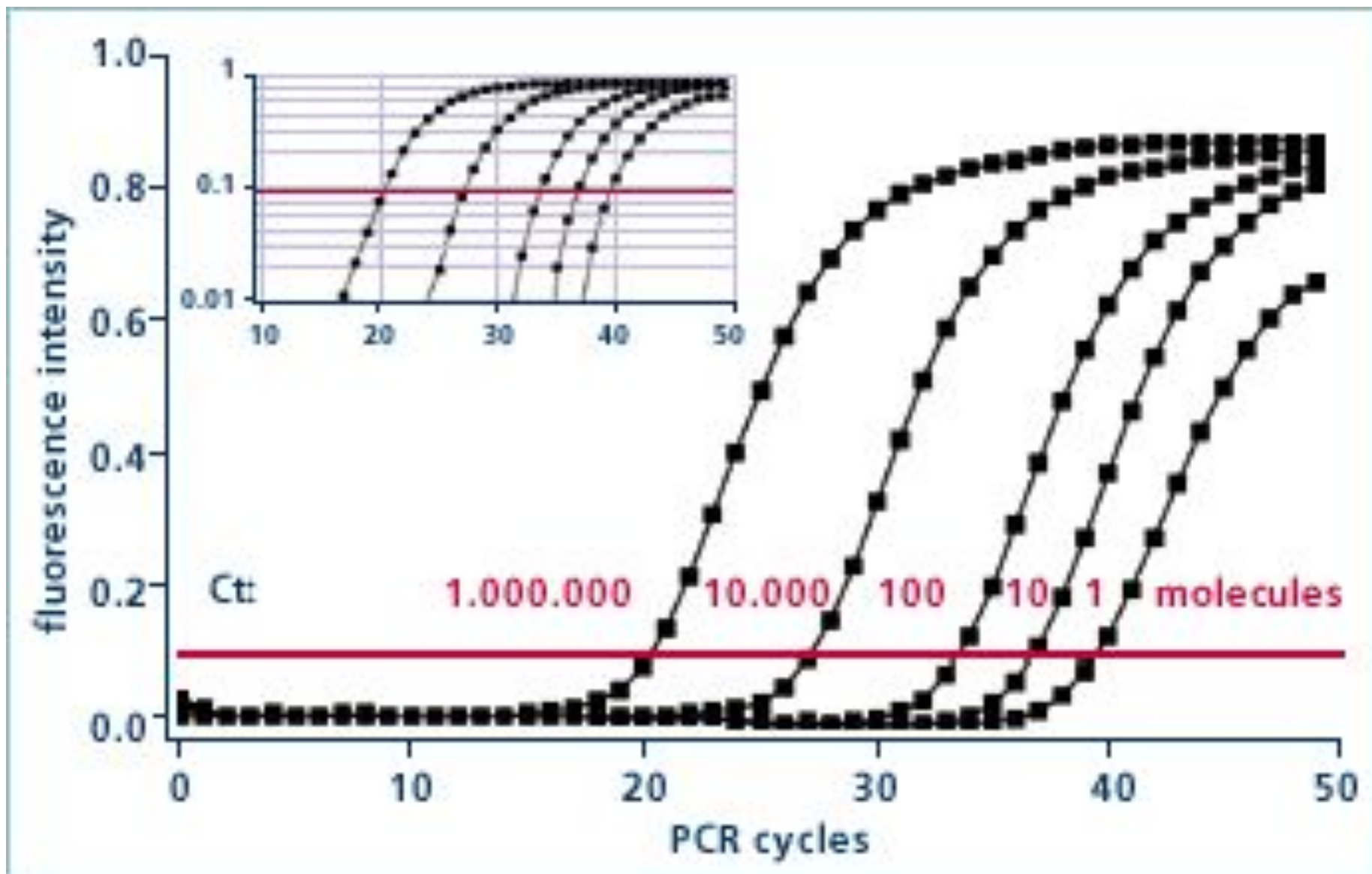
Структурные перестройки



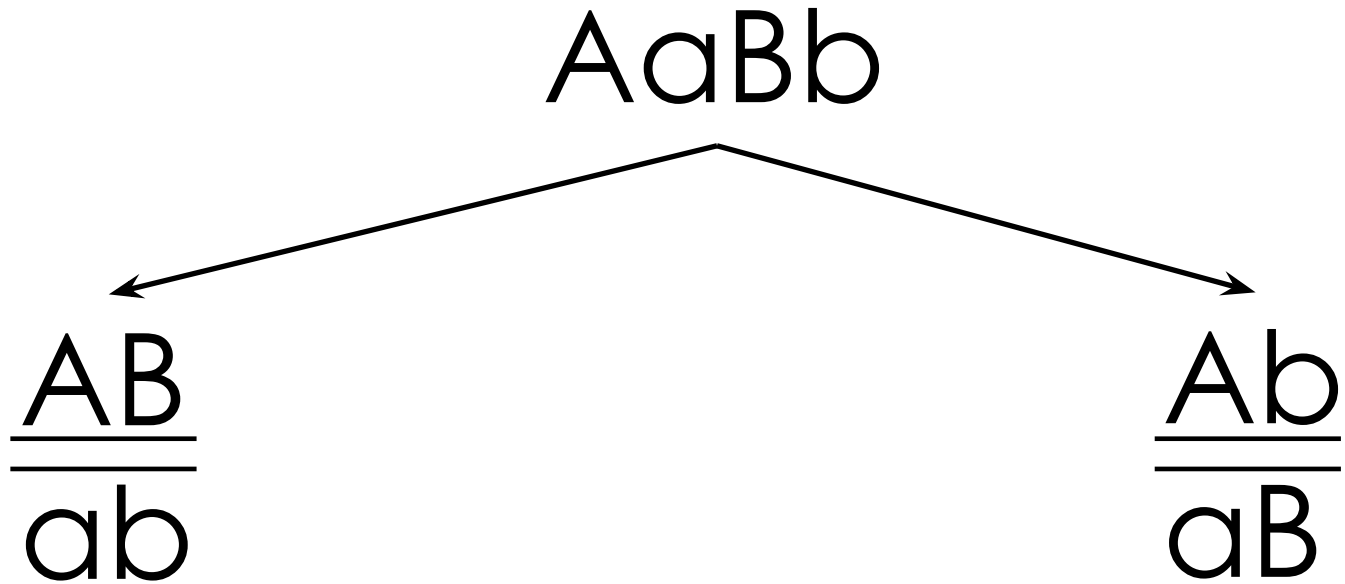
Флуоресцентная гибридизация in situ



Количественная ПЦР

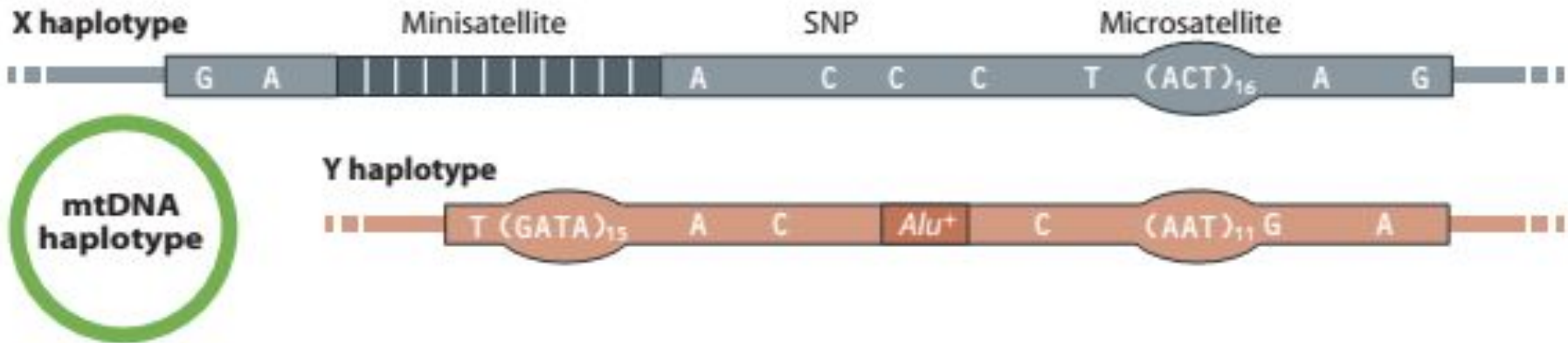


Гаплотип /фаза сцепления

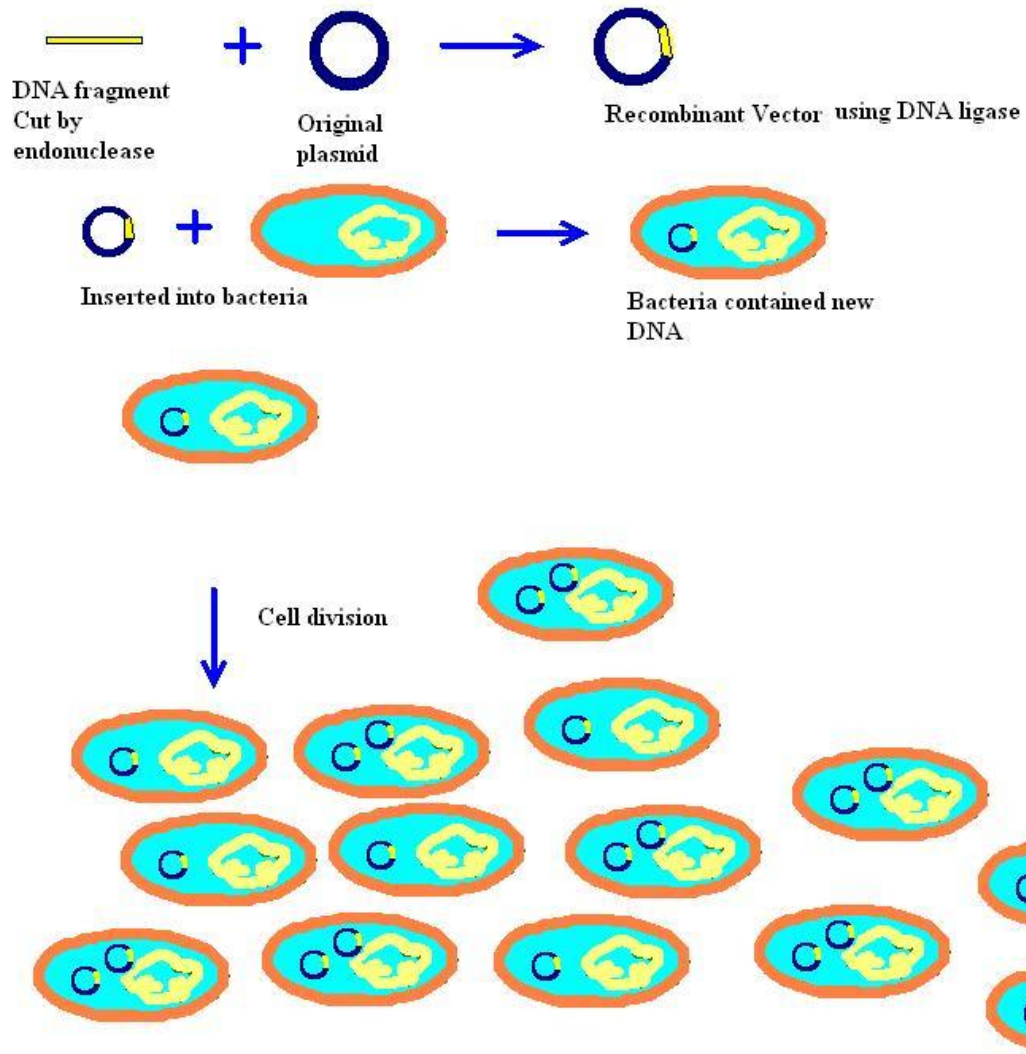


Прямое определение

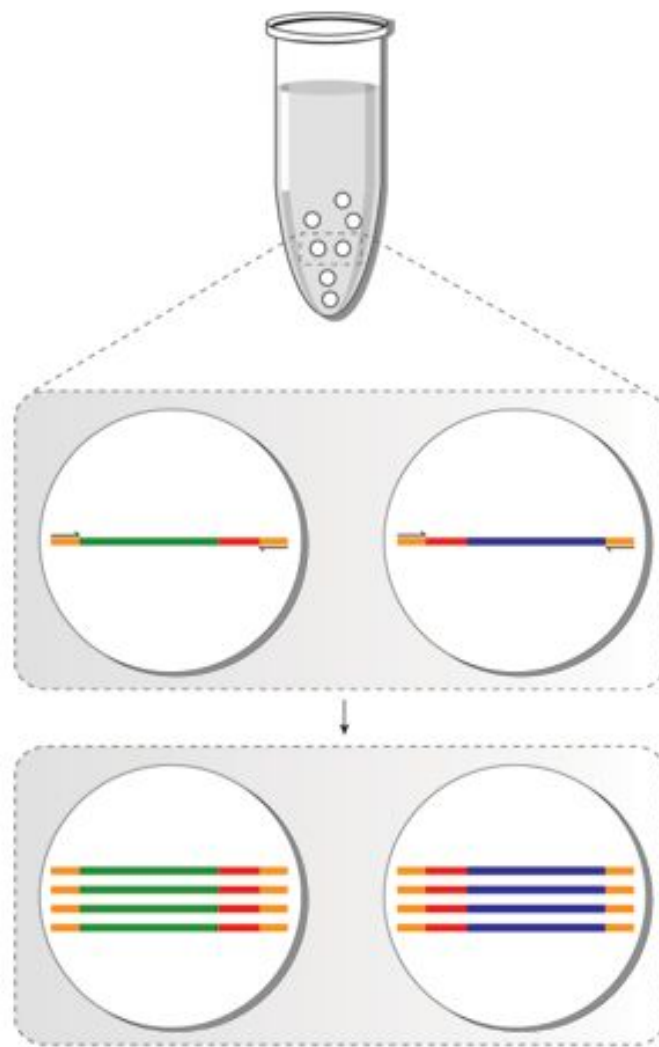
(a)



Клонирование

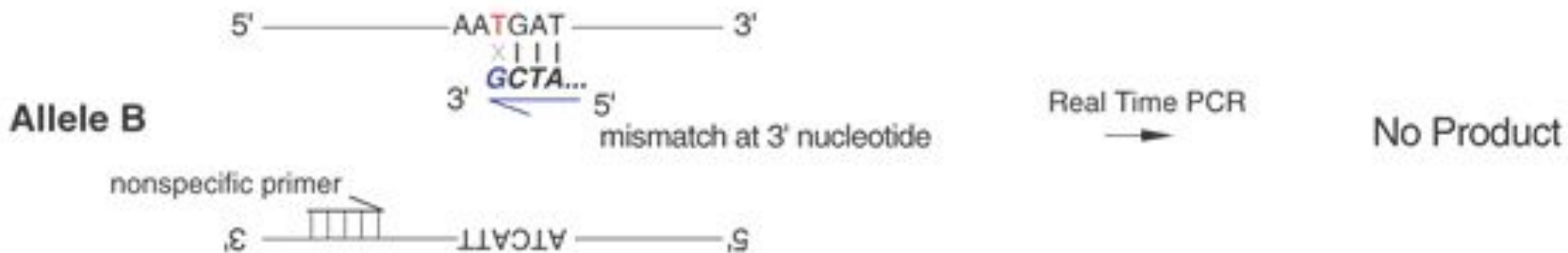
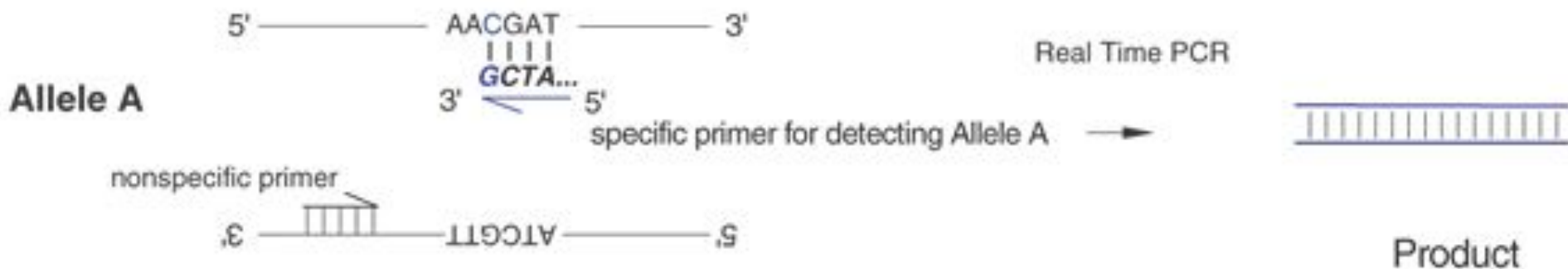


Разбавление (эмульсионная ПЦР)



«Длинная» аллель-специфическая ПЦР

A



Анализ родословных

