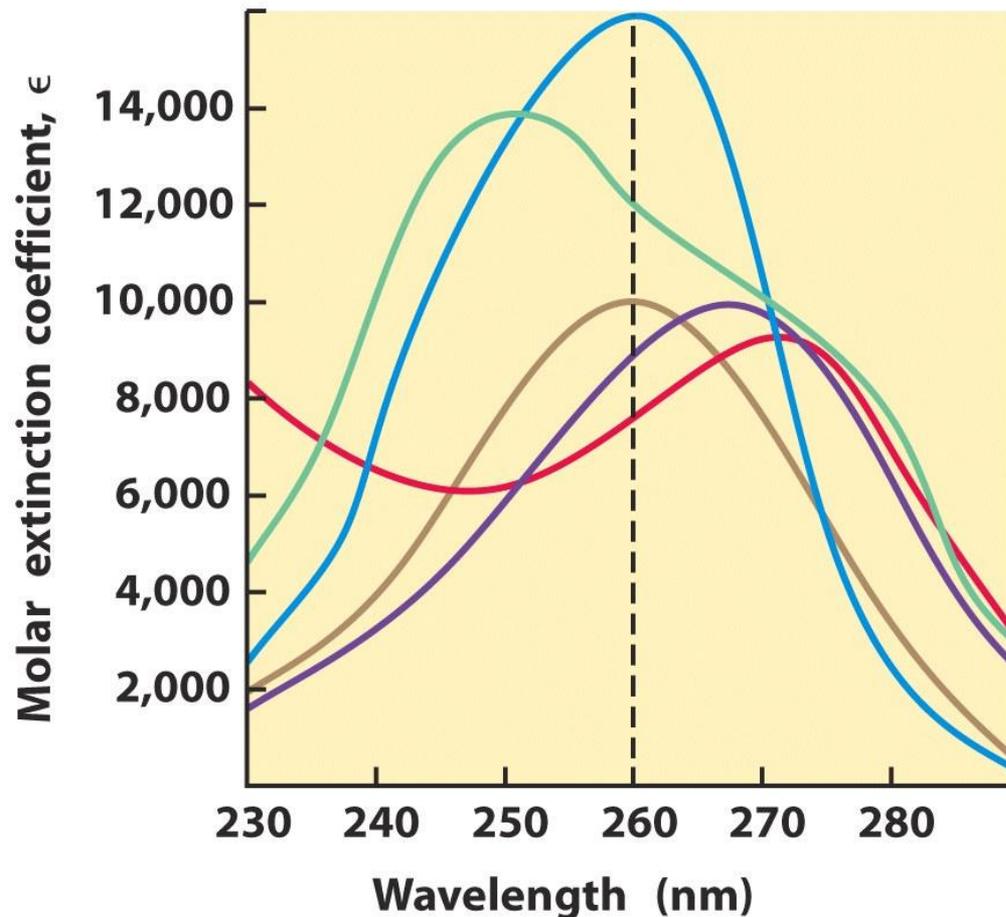


Физико-химические свойства ДНК

Спектры поглощения нуклеотидов



Molar extinction coefficient at 260 nm, ϵ_{260} ($M^{-1}cm^{-1}$)

AMP	15,400
GMP	11,700
UMP	9,900
dTMP	9,200
CMP	7,500

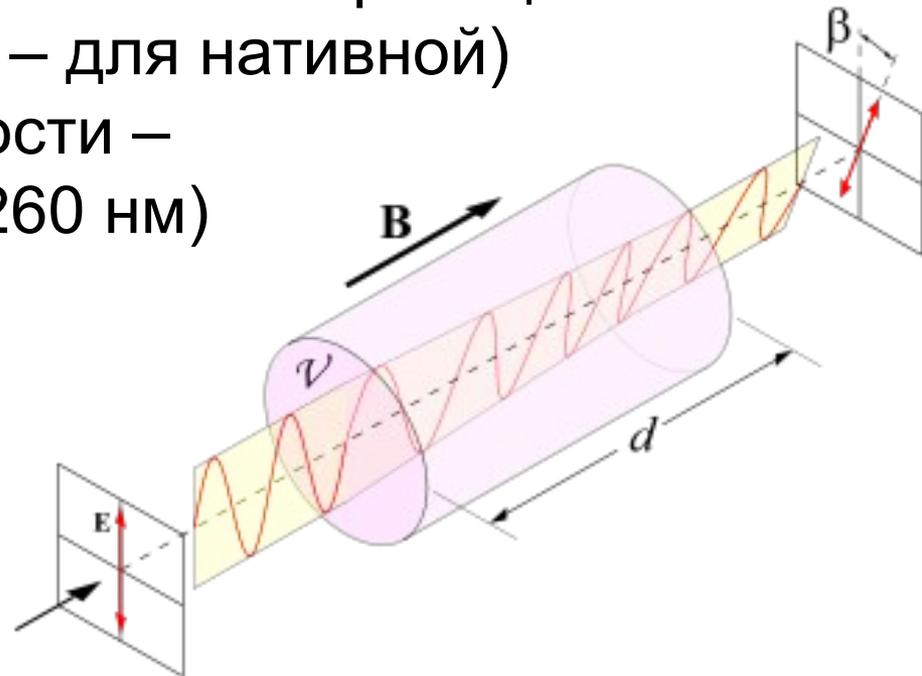
Физико-химические свойства ДНК

Денатурация («плавление») ДНК

Обратный процесс – ренатурация («отжиг»)

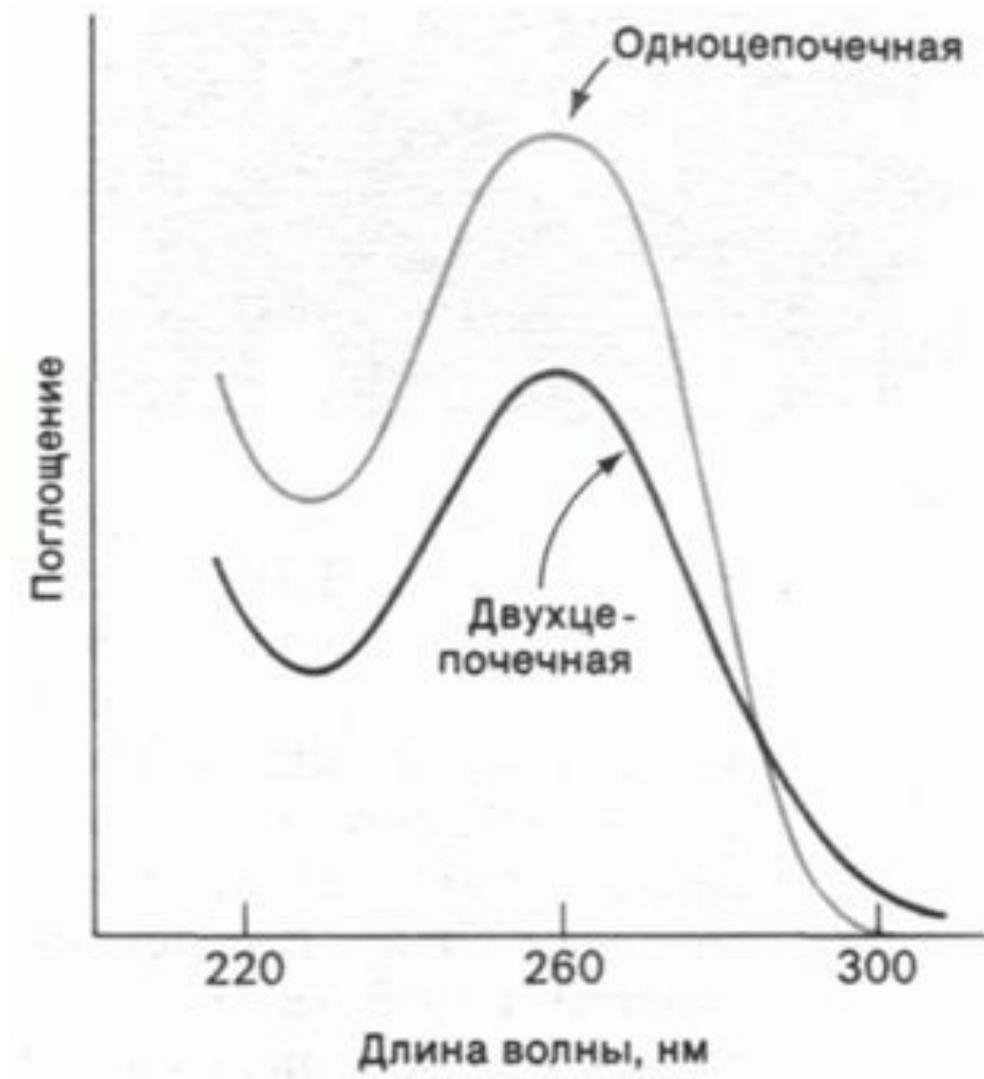
При денатурации наблюдаются:

- Уменьшение коэффициента вязкости раствора
- Увеличение плавучей плотности
- Отрицательное вращение плоскости поляризации света (в отличие от положительного – для нативной)
- Увеличение оптической плотности – *гиперхромный эффект* (при 260 нм)



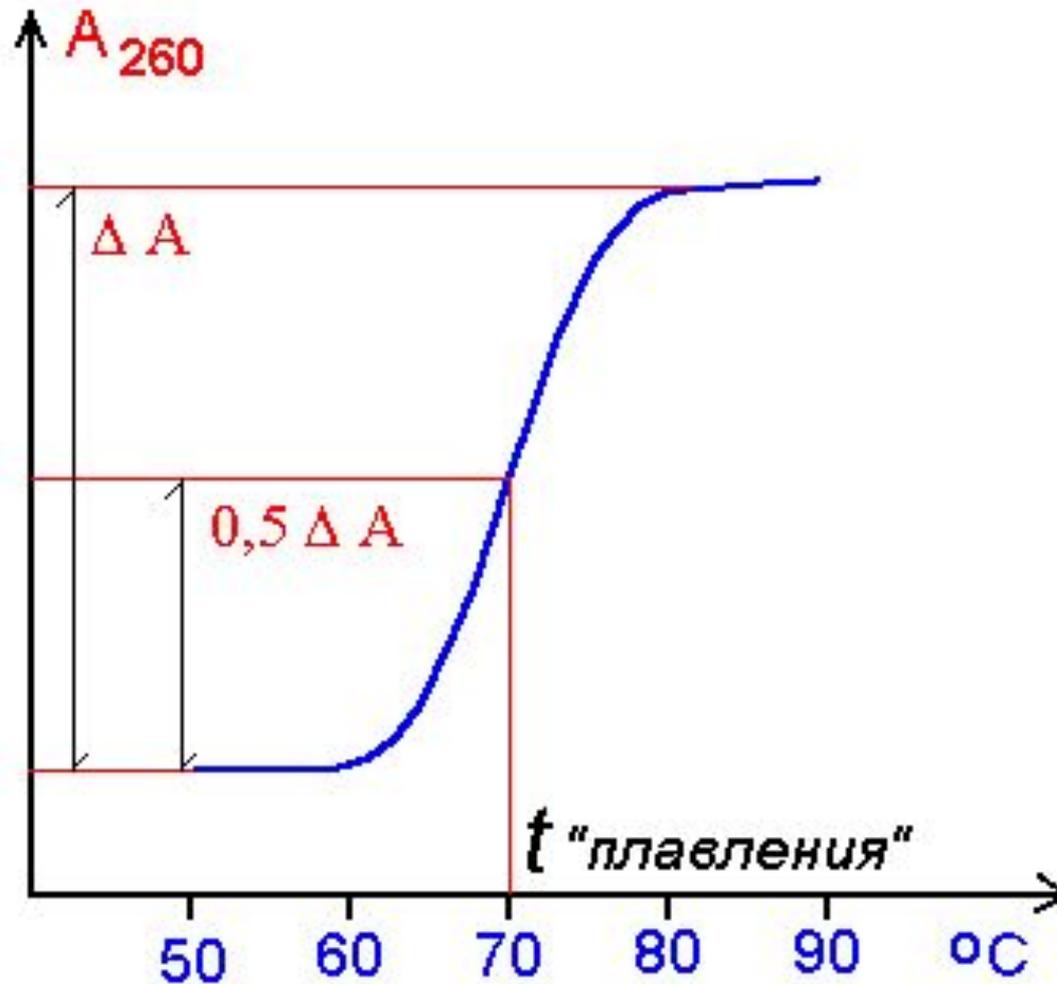
Физико-химические свойства ДНК

Гиперхромный и гипохромный эффекты



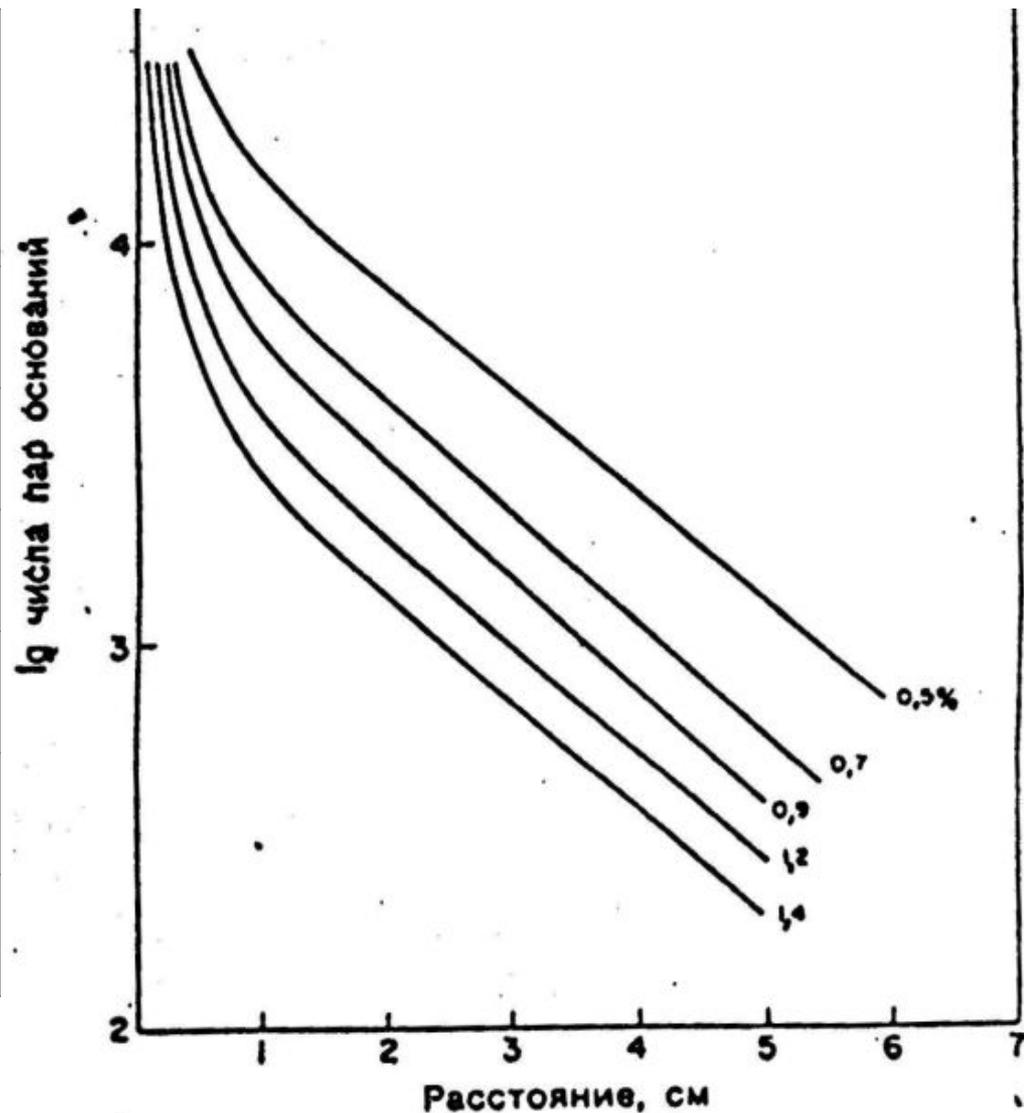
Физико-химические свойства ДНК

Температура «плавления» ДНК

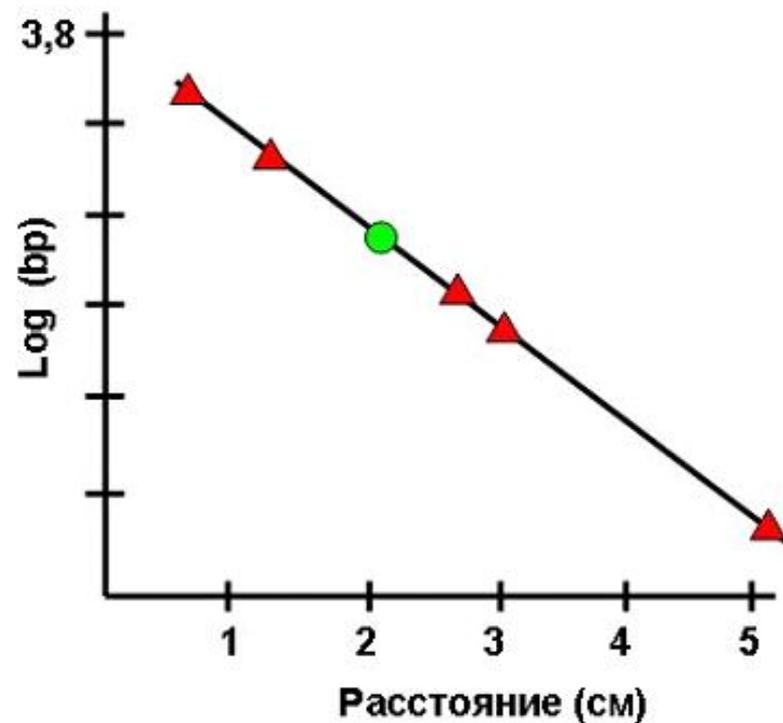
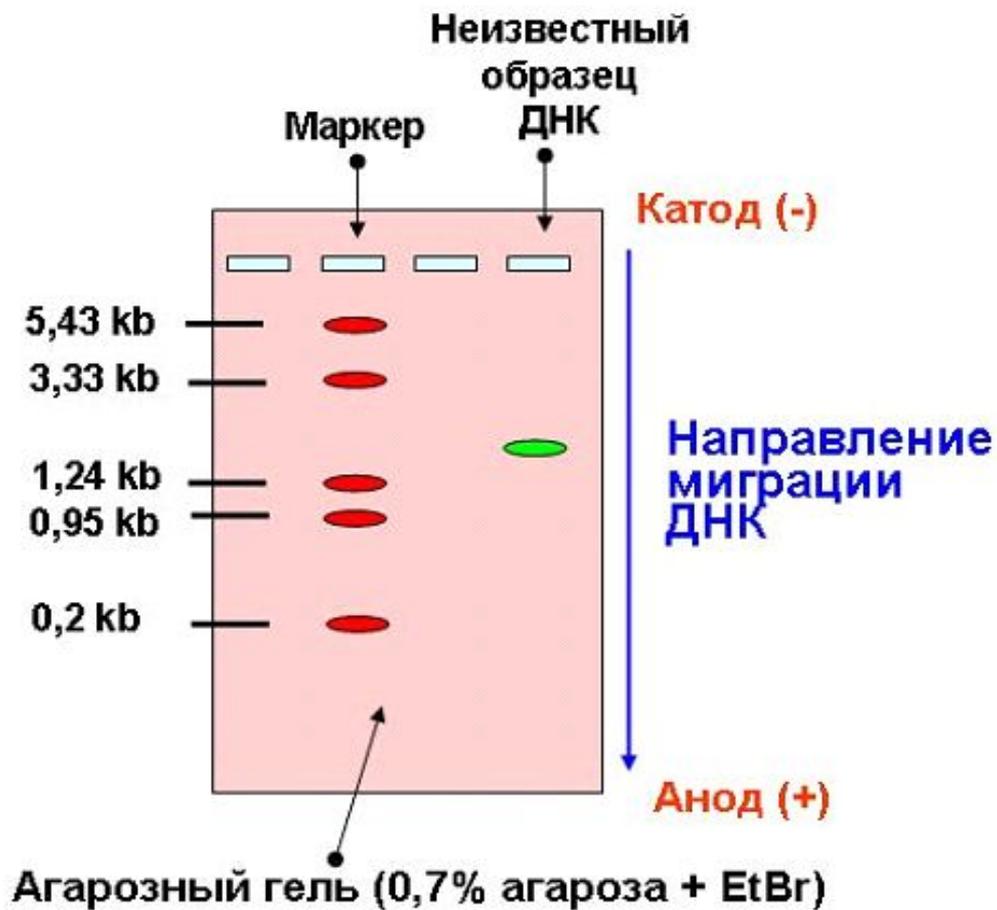


Электрофорез ДНК

Длина фрагм. ДНК, п.о.	Конц. агарозы, %
50–1500	2
300–3000	1.5
400–6000	1.2
500–10000	1
800–10000	0.7
1000–20000	0.5



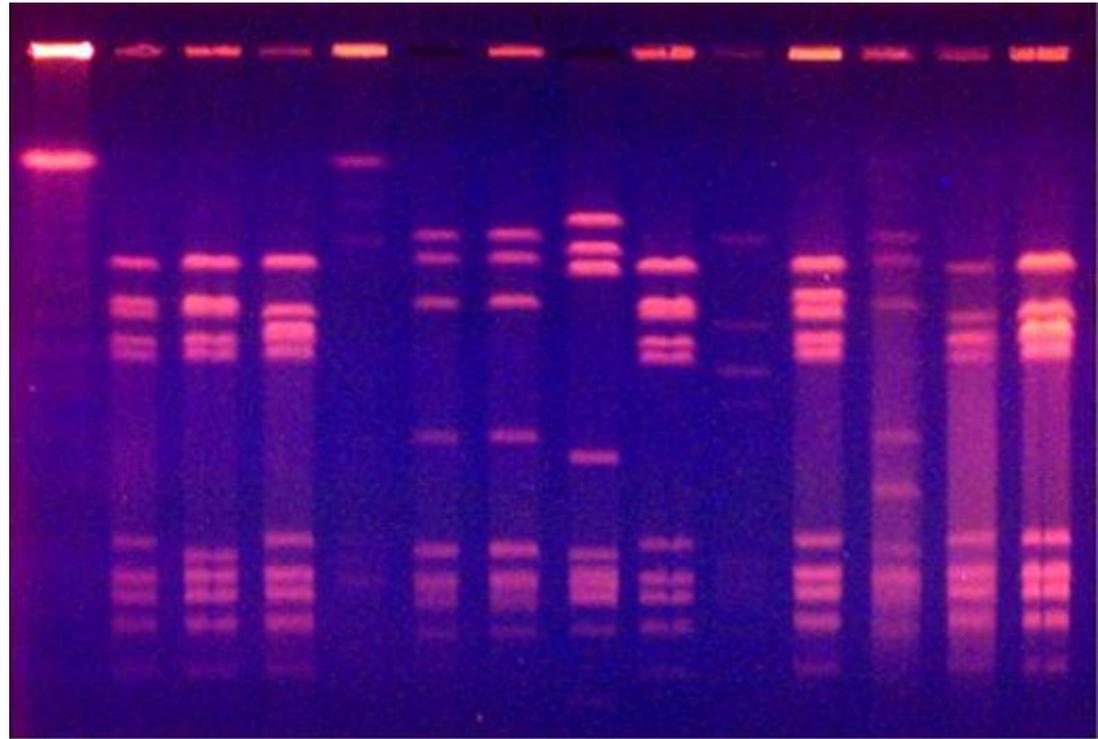
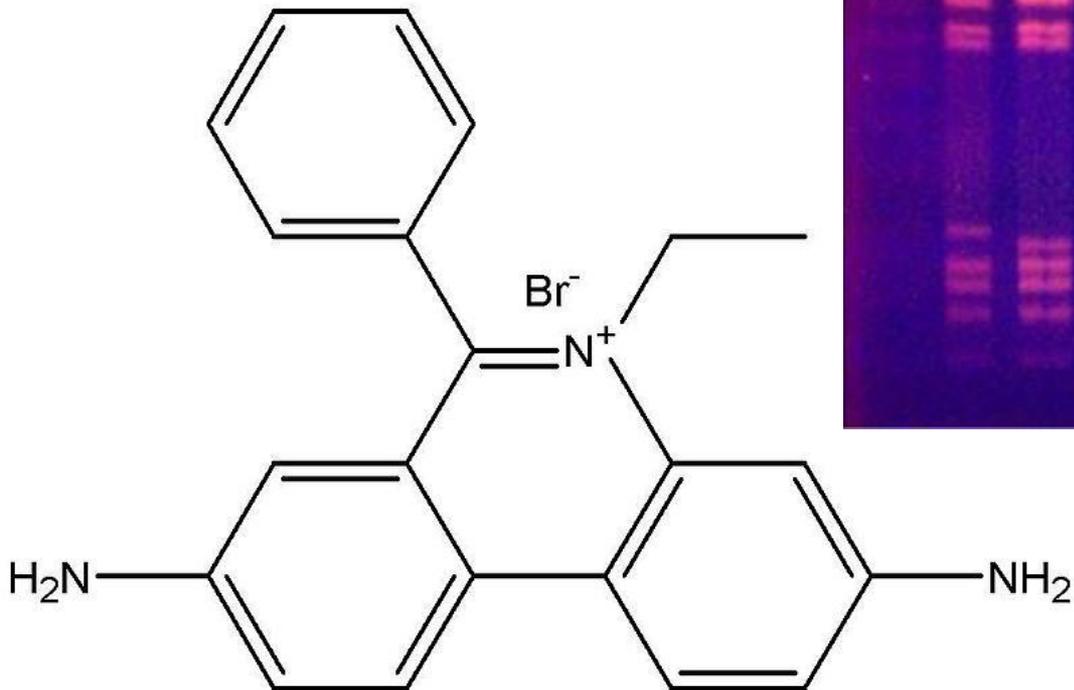
Электрофорез ДНК



Электрофорез ДНК

Бромистый этидий

(3,8-диамино-5-этил-6-фенилфенантридиум бромид)



Канцероген!!!

Next Generation Sequencing

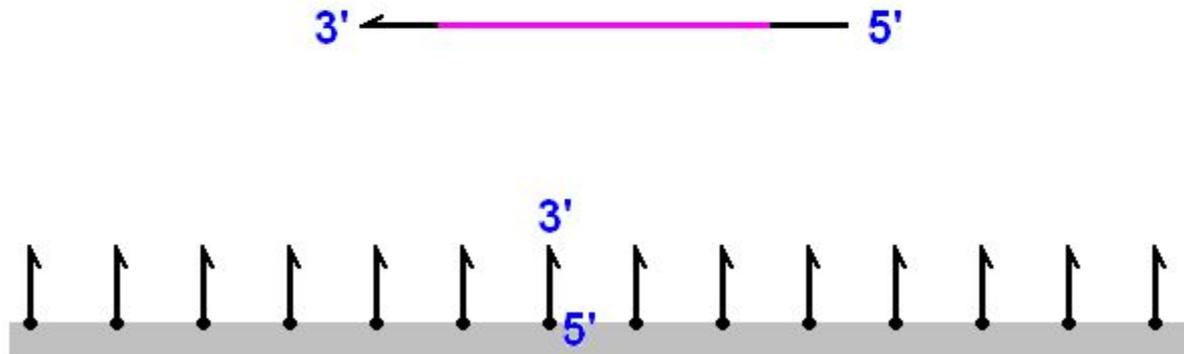
Illumina

illumina®



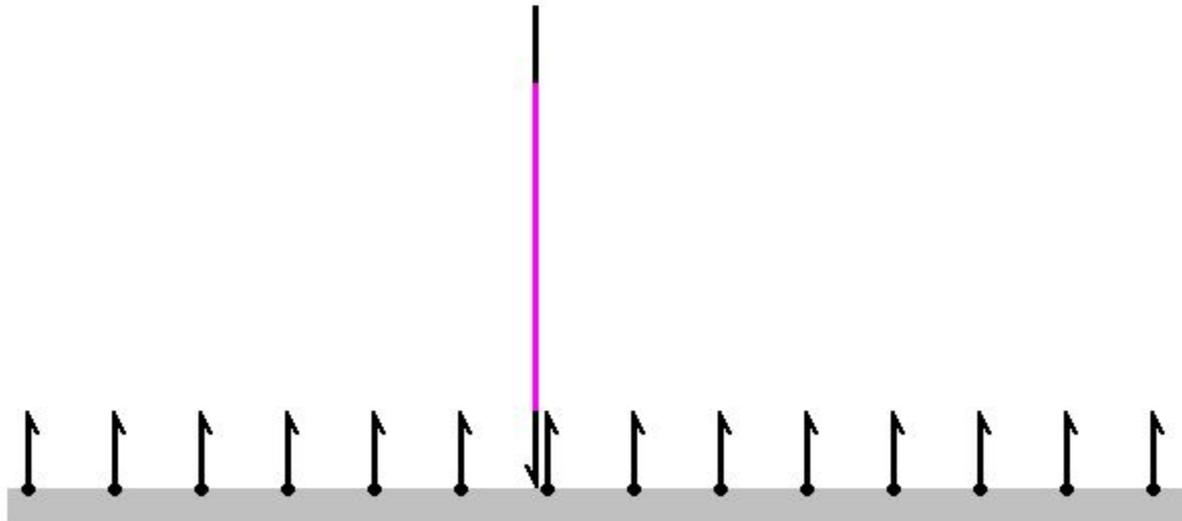
Next Generation Sequencing

ILLUMINA



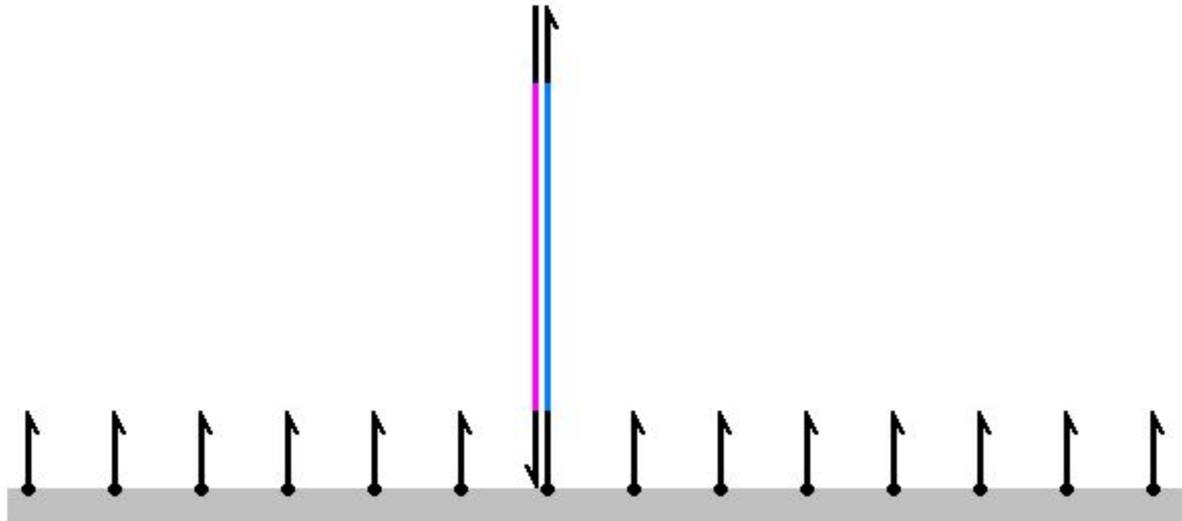
Next Generation Sequencing

ILLUMINA



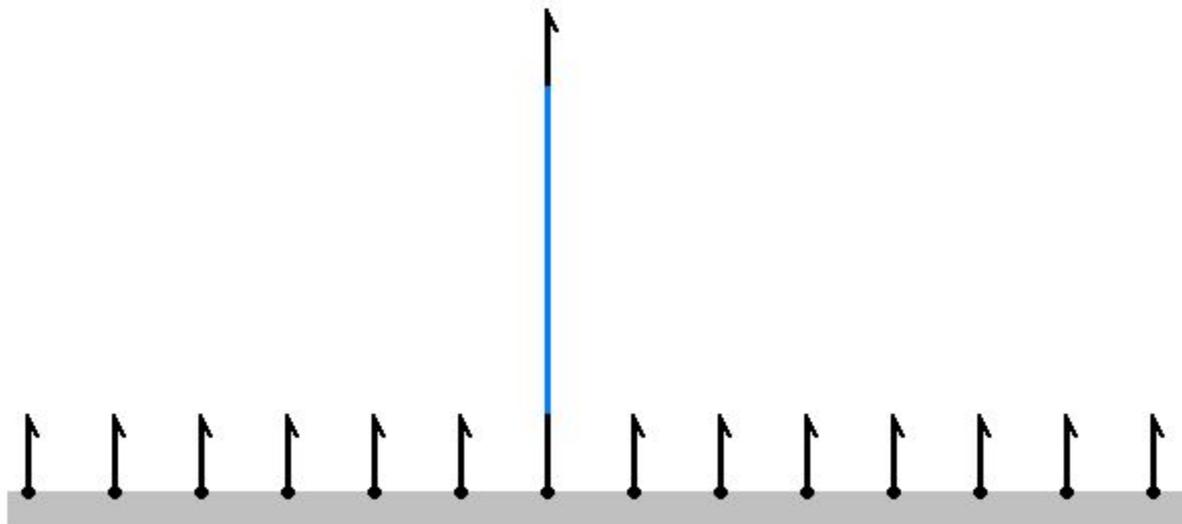
Next Generation Sequencing

ILLUMINA



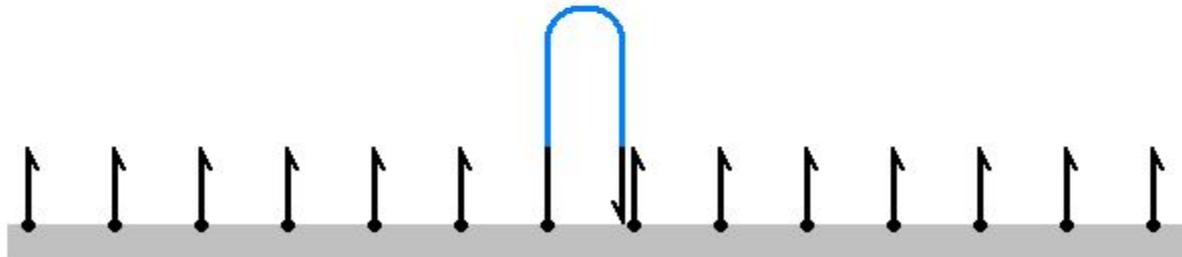
Next Generation Sequencing

ILLUMINA



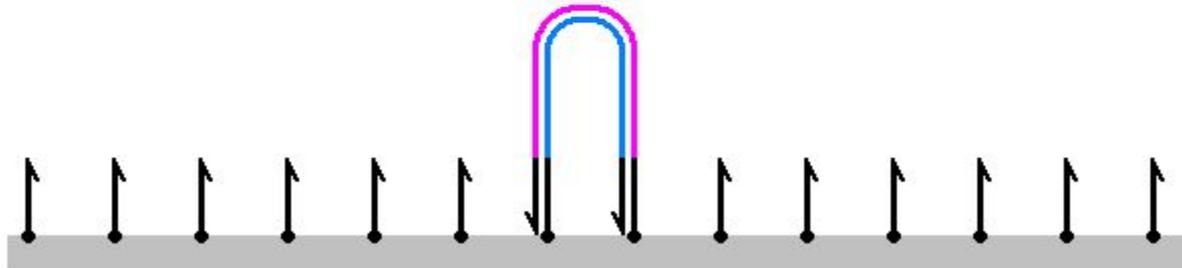
Next Generation Sequencing

Illumina



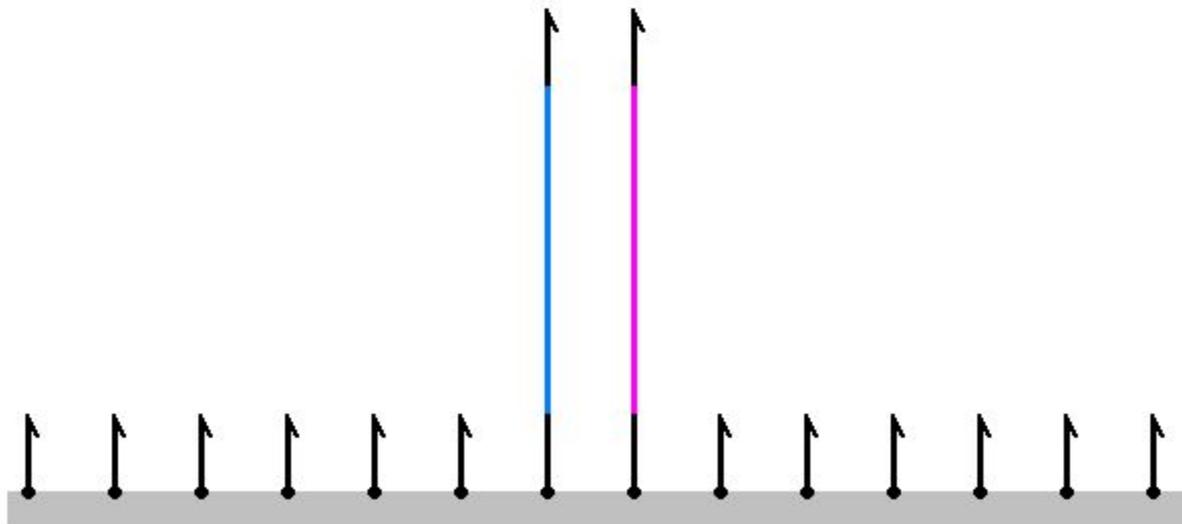
Next Generation Sequencing

Illumina



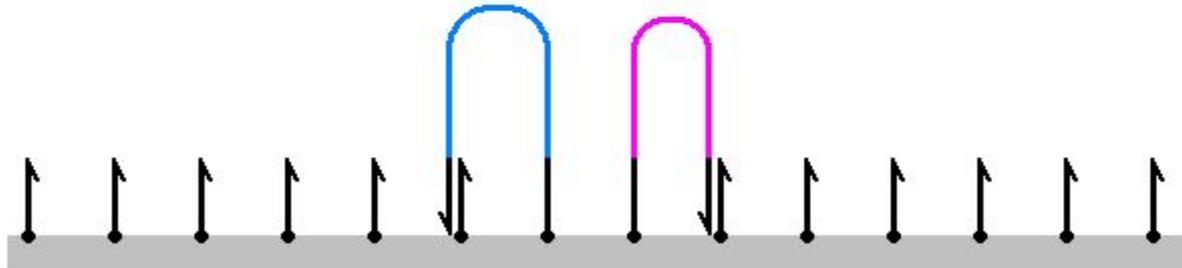
Next Generation Sequencing

ILLUMINA



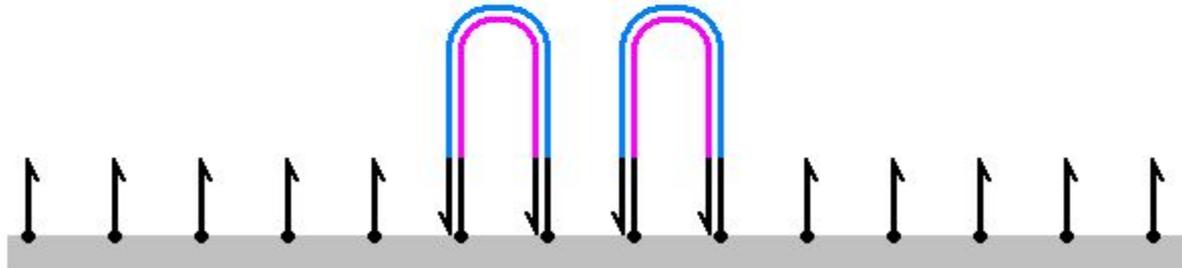
Next Generation Sequencing

Illumina



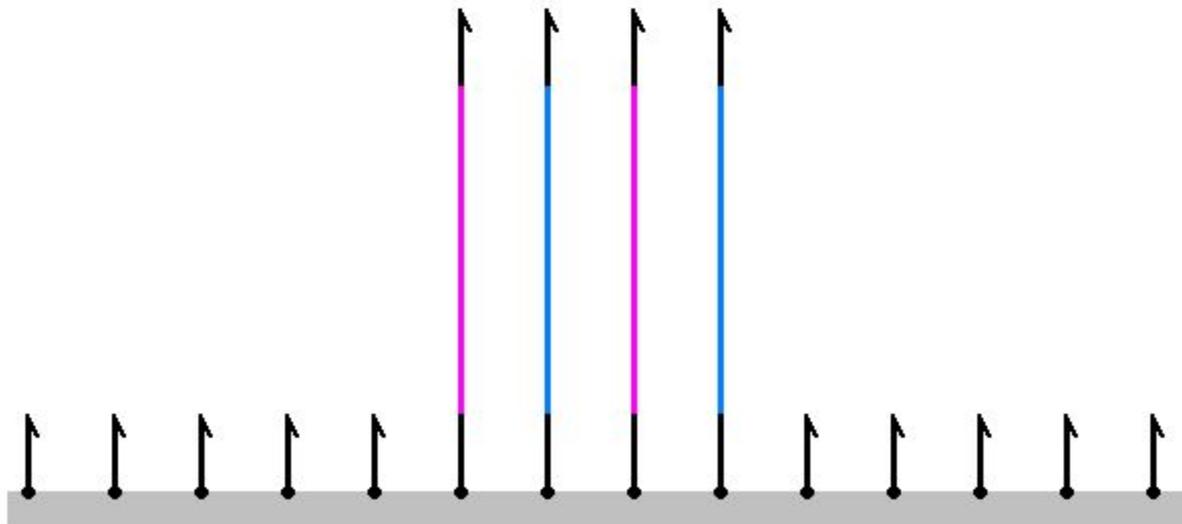
Next Generation Sequencing

Illumina



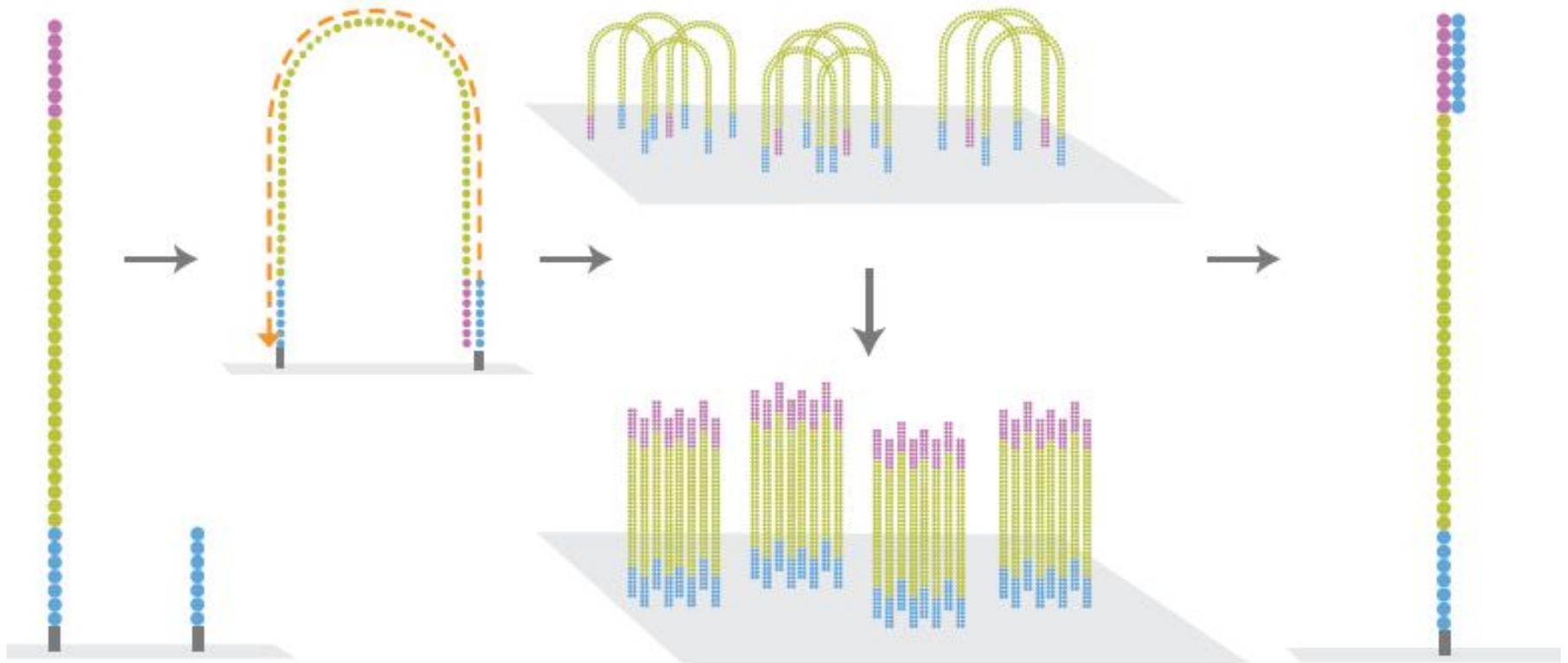
Next Generation Sequencing

Illumina



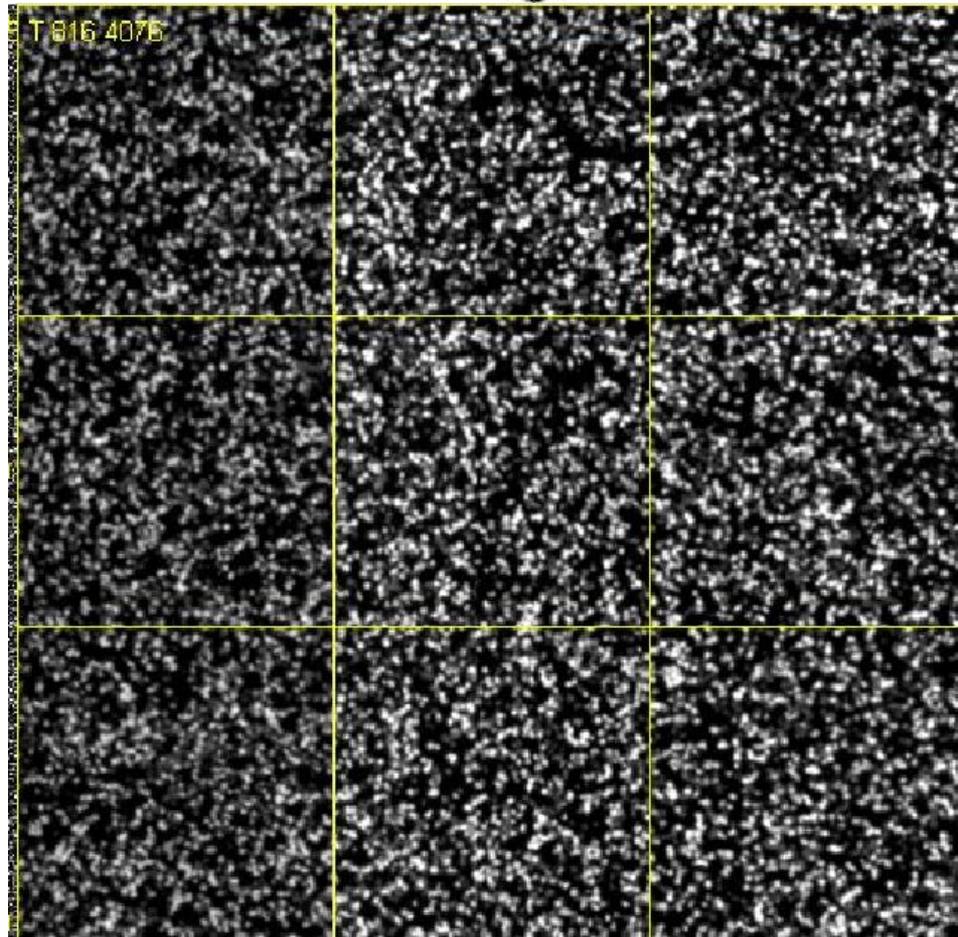
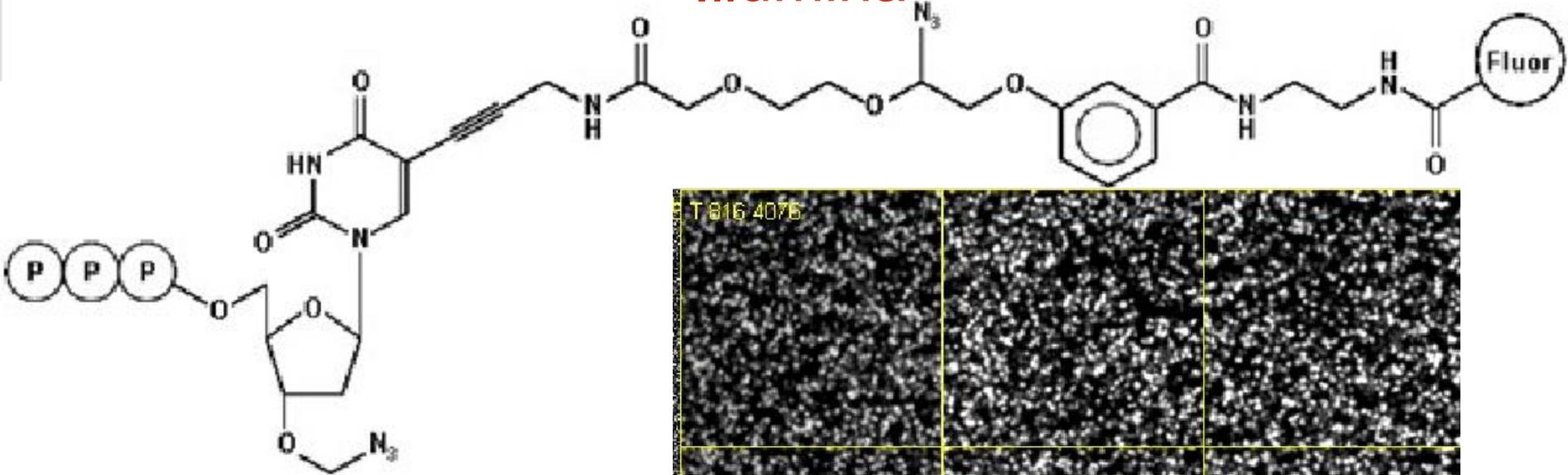
Next Generation Sequencing

ILLUMINA



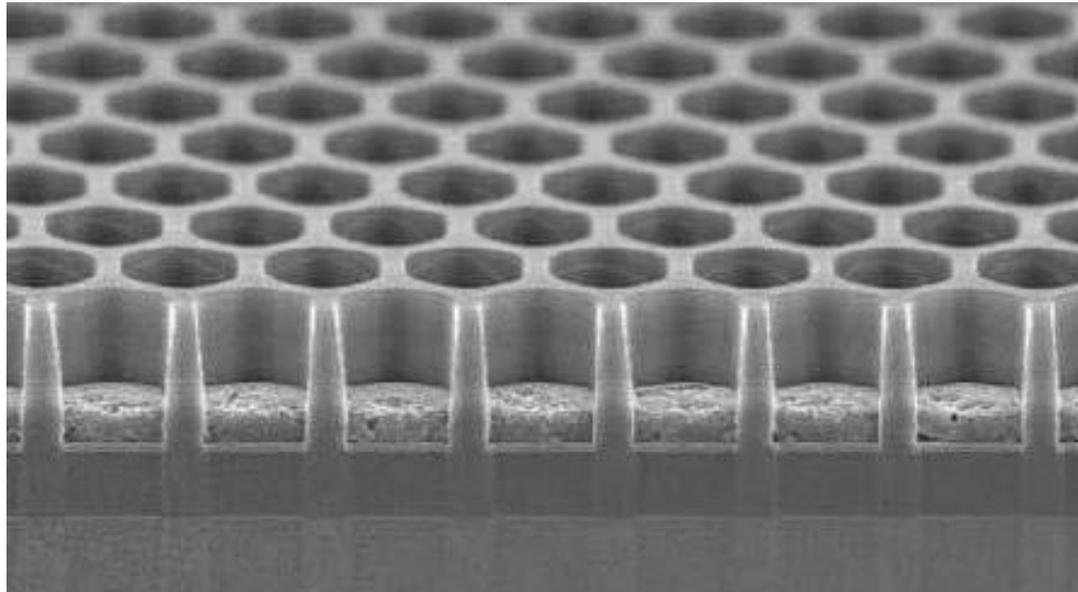
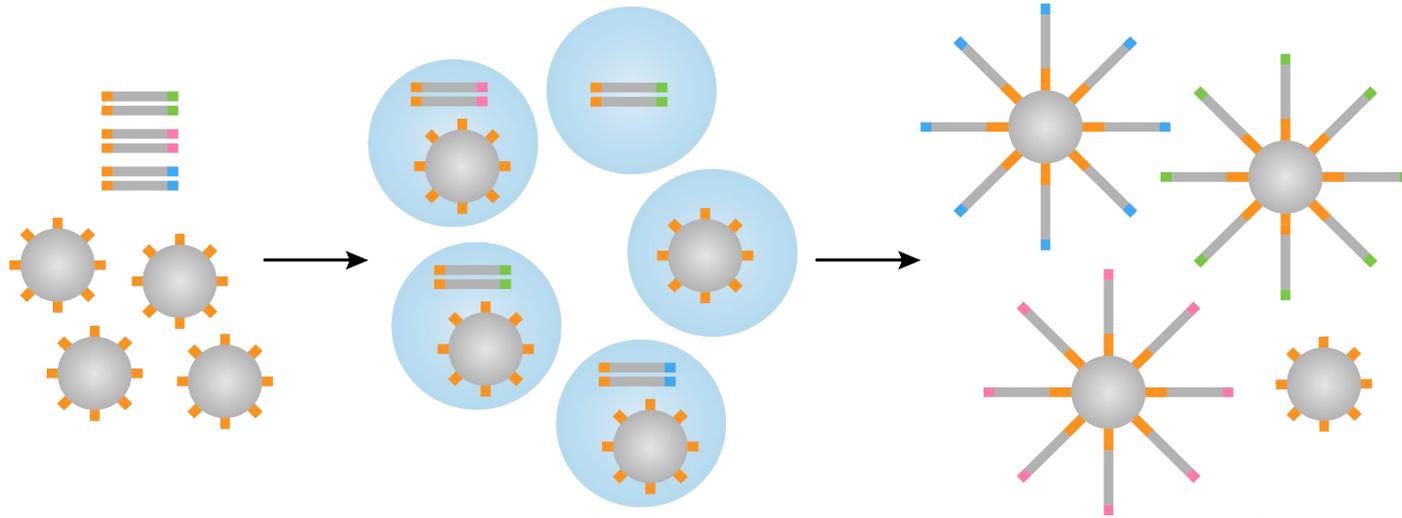
Next Generation Sequencing

Illumina



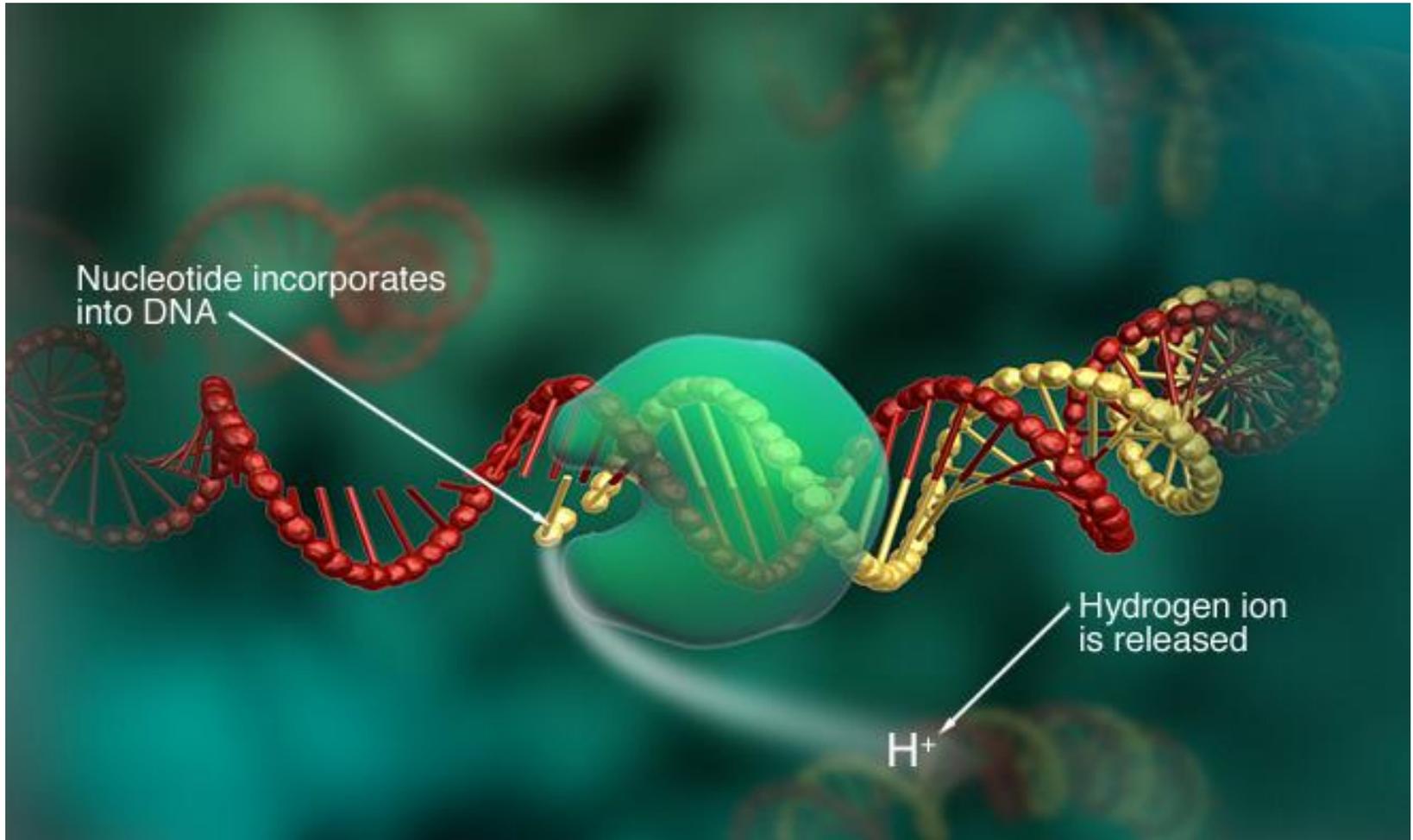
Next Generation Sequencing

Ion Torrent



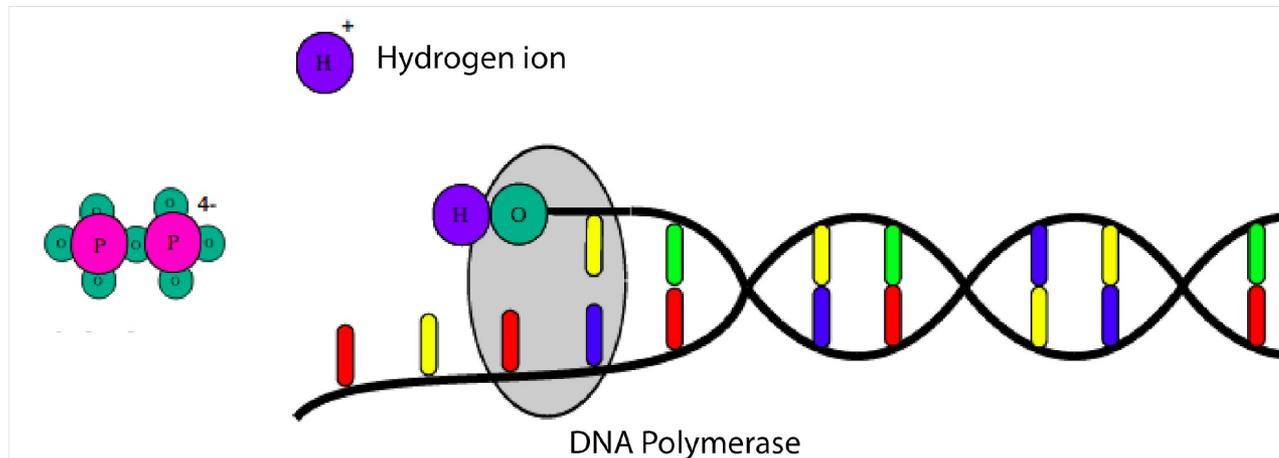
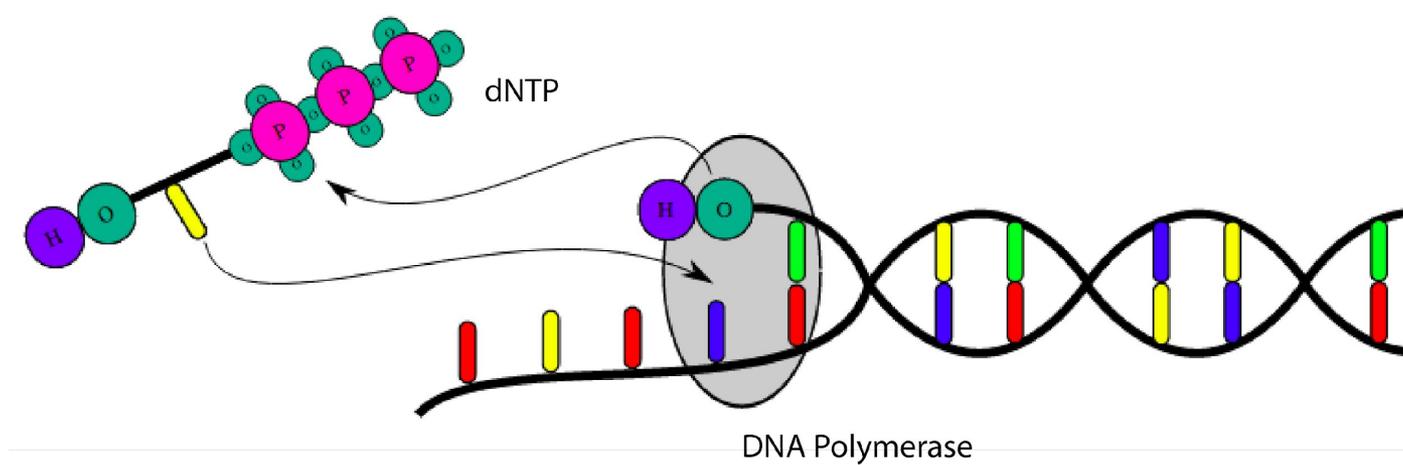
Next Generation Sequencing

Ion Torrent



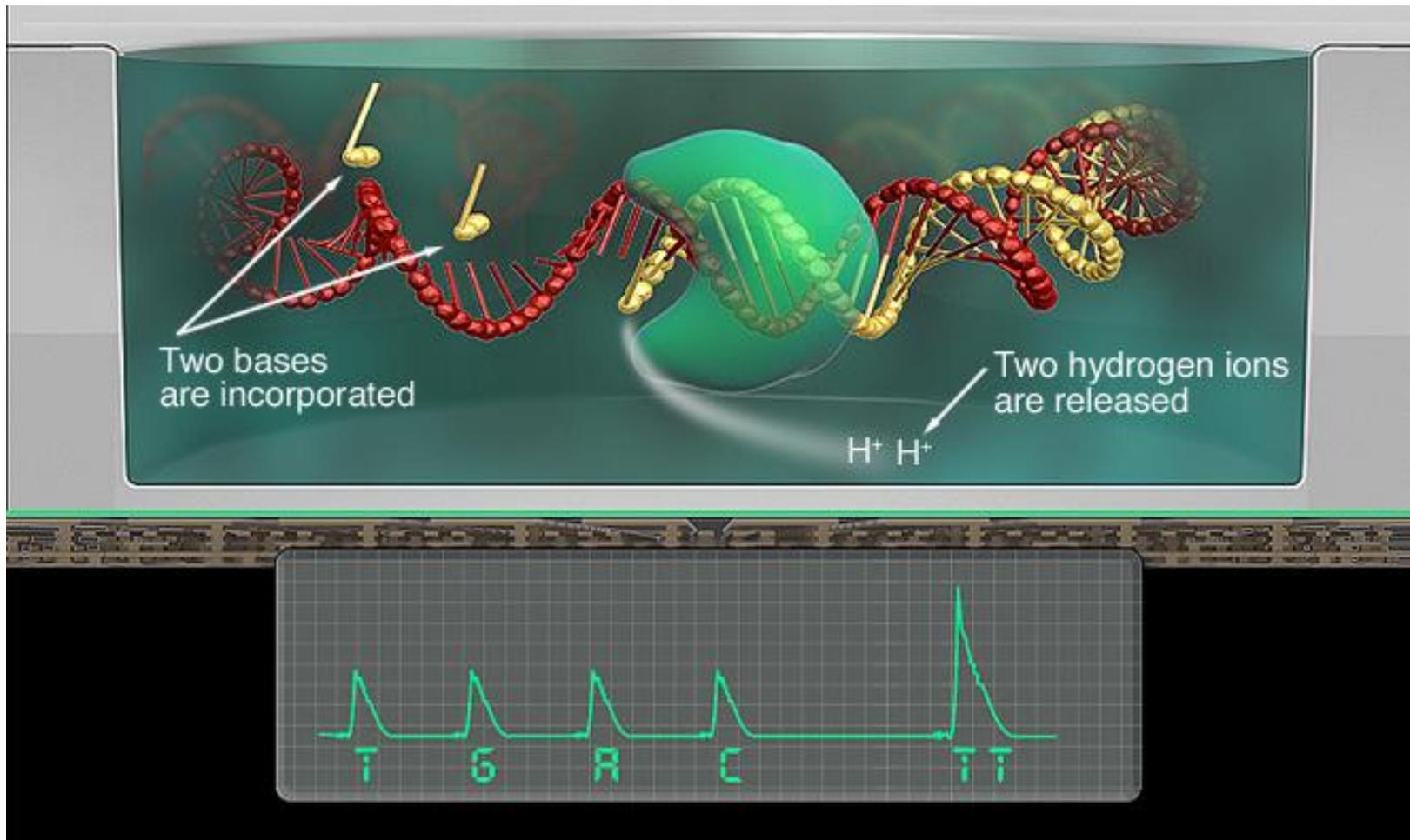
Next Generation Sequencing

Ion Torrent



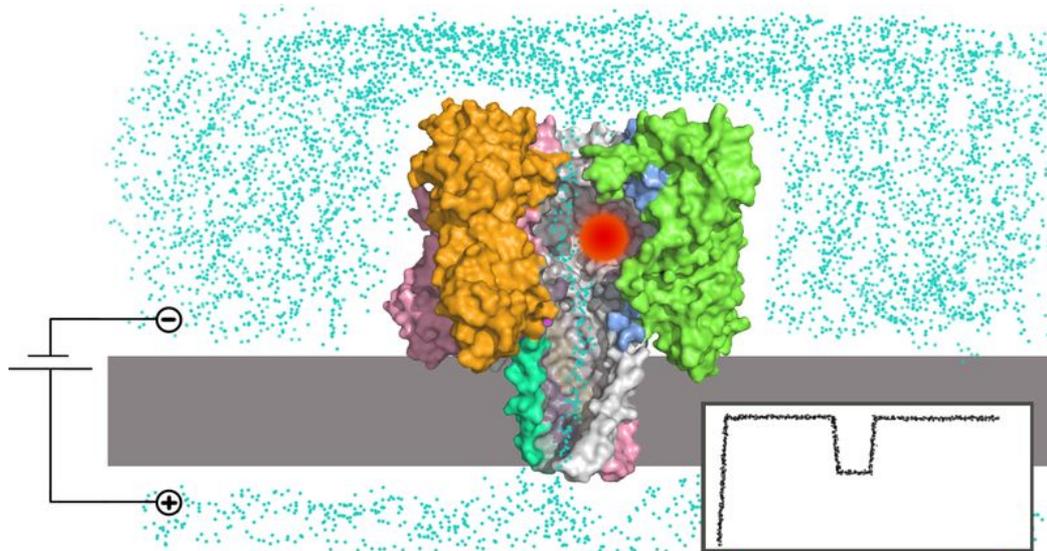
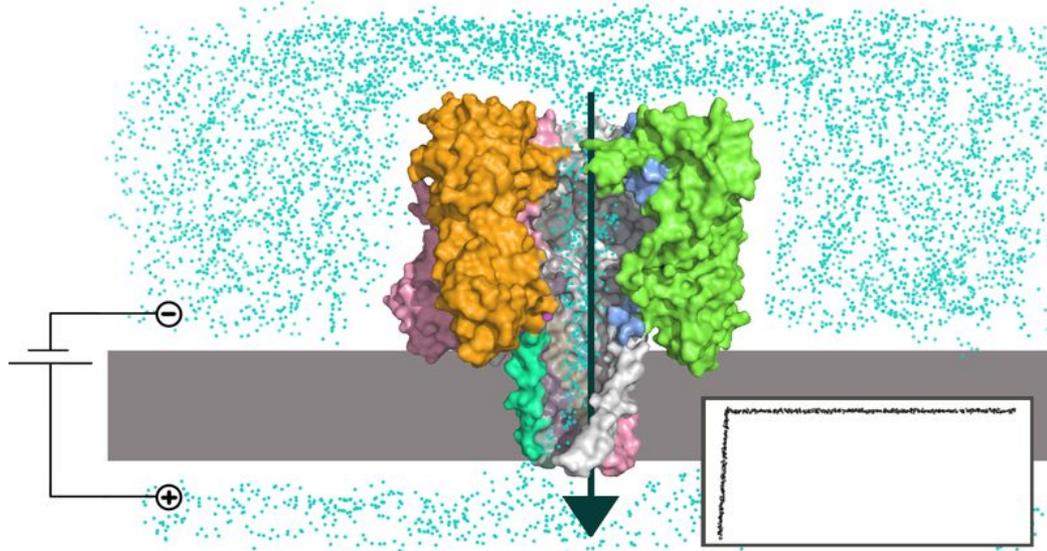
Next Generation Sequencing

Ion Torrent



Next Generation Sequencing

Нанопоровое секвенирование



Next Generation Sequencing

Нанопоровое секвенирование

- Белковые нанопоры
 - Альфа-гемолизин *Staphylococcus aureus*
 - MspA – порин A
Mycobacterium smegmatis
 - Моторный белок упаковки ДНК
бактериофага *phi29*
(модифицированный)
- Твердотельные нанопоры
 - нитрид кремния
 - графен

