

**O'ZBEKISTON RESPUBLIKASIN
OLIV VA O'RTA MAXSUS TA'LIM VAZIRLIGI
MIRZO ULEG'BEK NOMIDAGI
O'ZBEKISTON MILLIY UNIVERSITETI
MIKROBIOLOGIYA VA BIOTEXNOLOGIYA KAFEDRASI**

MIKROBIOLOGIYA VA VIRUSOLOGIYA FANI

MAVZU: MIKROBIOLOGIYANING TADQIQOT METODLARI

Fan o'qituvchisi: b.f.n. Fayziyev V.B.

Toshkent-2018

DARS REJASI:

1. Mikrobiologik laboratoriya tadqiqotlari uskunalari.
2. Mikroorganizmlarni o'rganishning mikrobiologik usullari.
3. Biologik usullar.
4. Immunologik usullar.
5. Molekulyar biologik usullar.

Tayanch iboralar : Mikroskopiya, Agar-agar, pepton agari, sentrifuga, avtoklav, termostat, PSR, serologik, bakteriologik, immunoferment.

MIKROBIOLOGIYA LABORATORIYASI:



Mikrobiologiya laboratoriyasida ishlash jarayoni

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



PreviColorGram

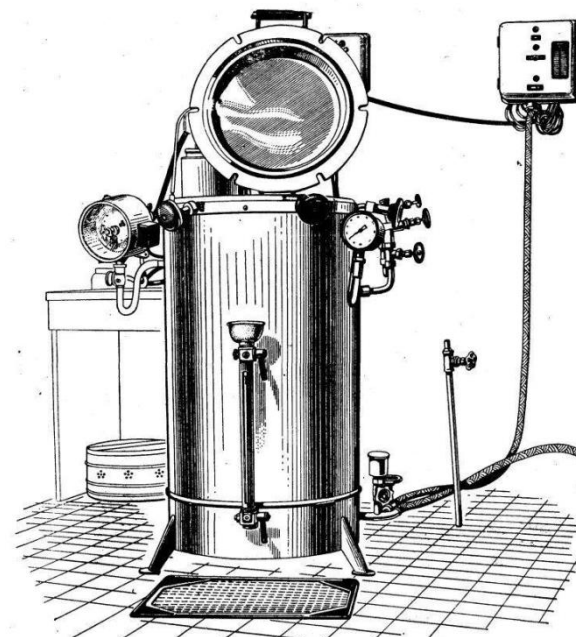
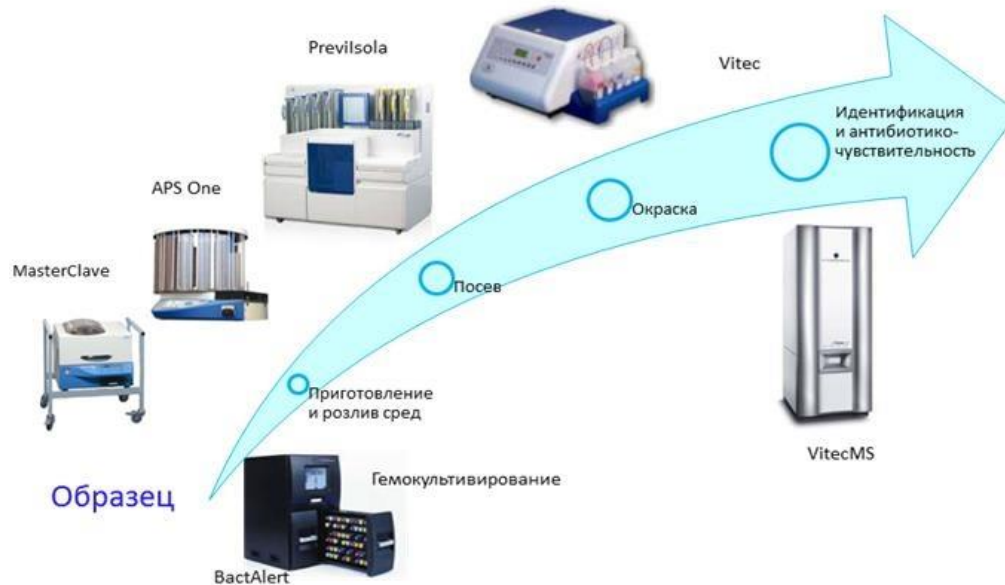


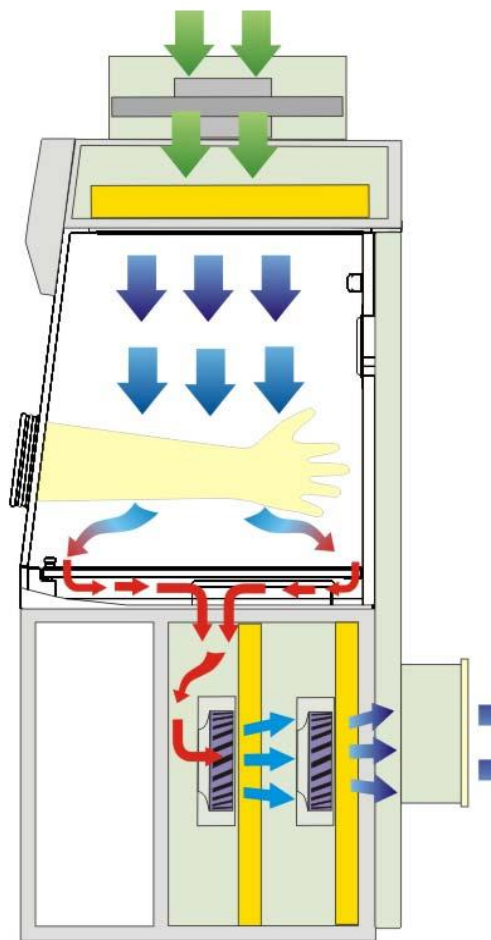
Рис. 24. Автоклав.

[microbiology.ru](http://microbiology.ru/ru)



Сентрифуга

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



www.oborudunion.ru

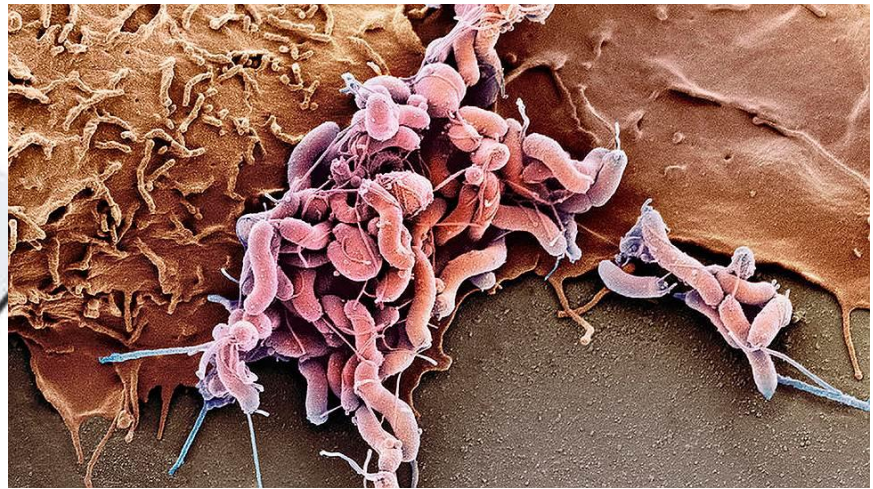
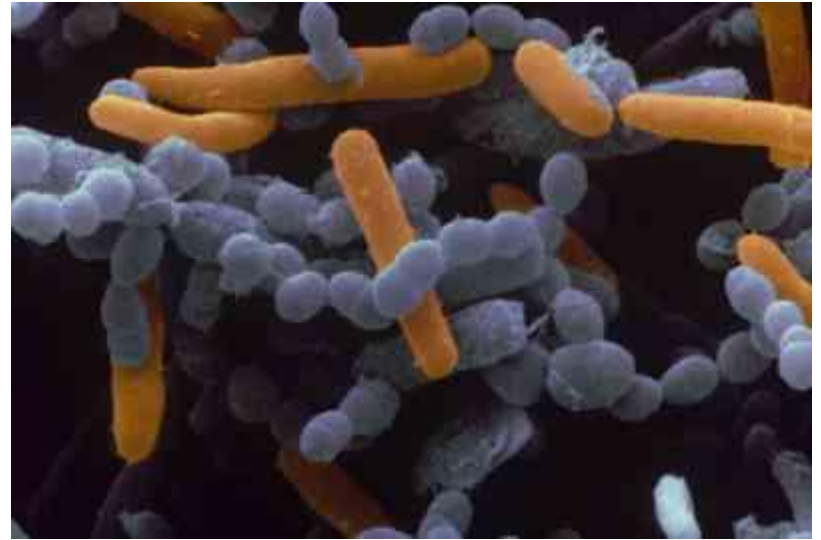
Mikrobologik laminar boks va unda ishlash jarayoni

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



Yorug'lik mikroskopi va obyektiv xillari

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



Elektron mikroskopi va mikroorganizlar rasmlari

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



Sentrifuga

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



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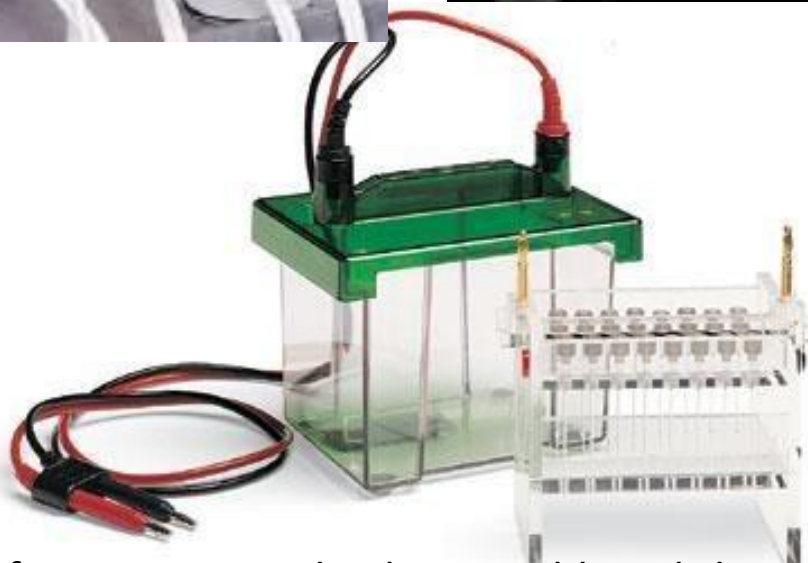
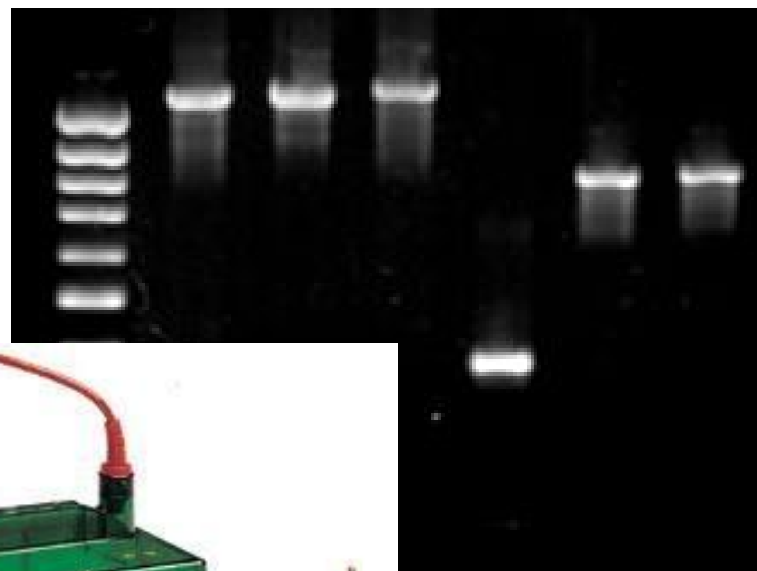


Termostat va uning ichki tuzilishi

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



Elektrtoforez va PSR mahsulotini gelda ajrlash jarayoni

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



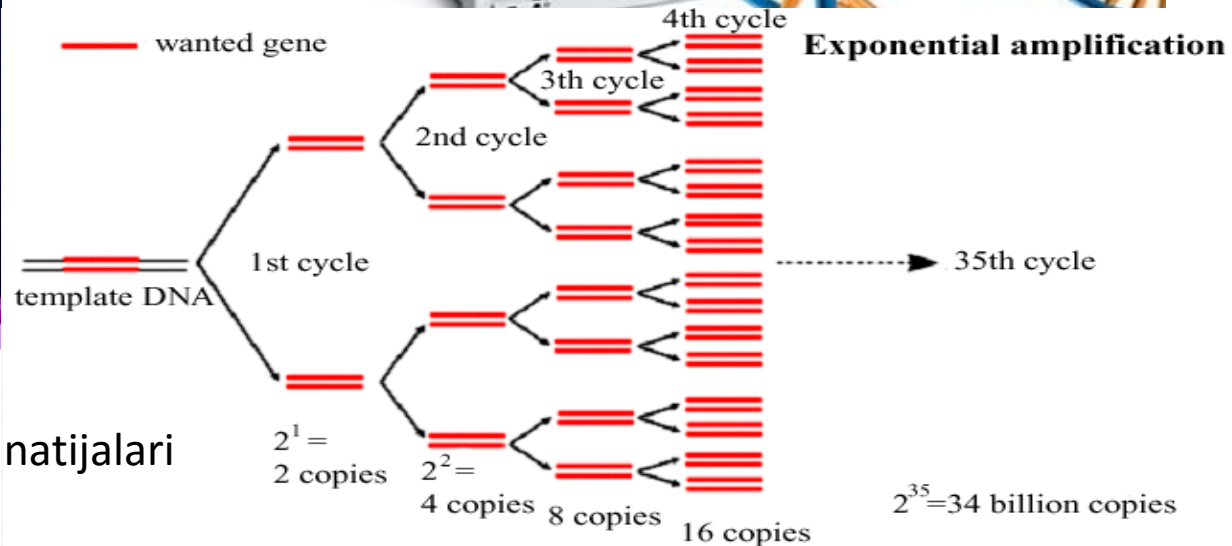
Avtoklav turlari

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



Kachalka va pH-metr

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



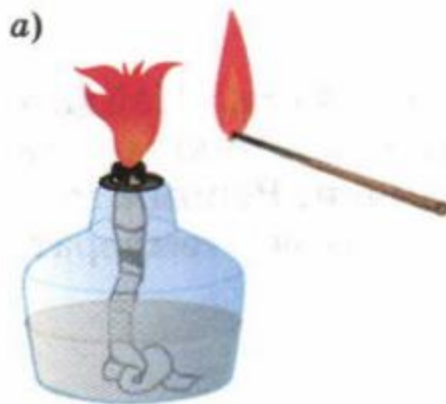
PSR jarayoni va uning natijalari

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



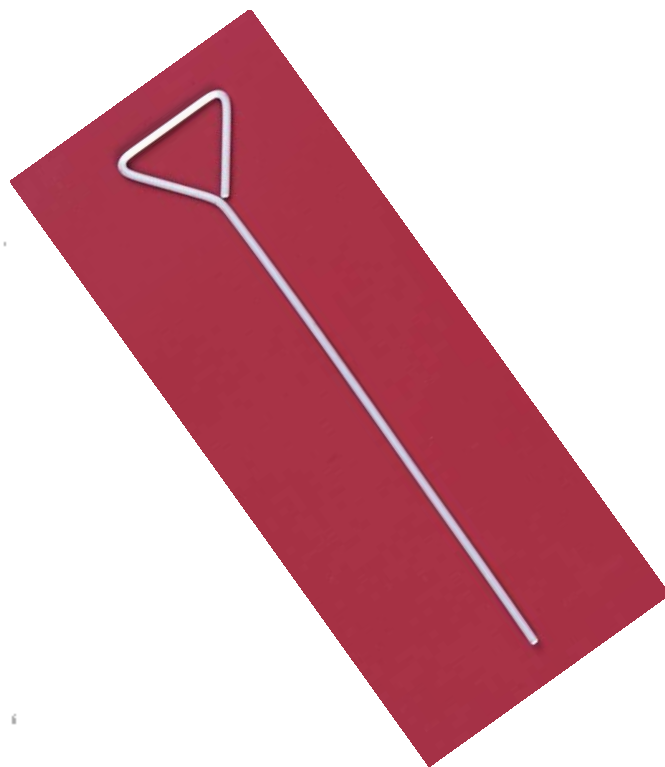
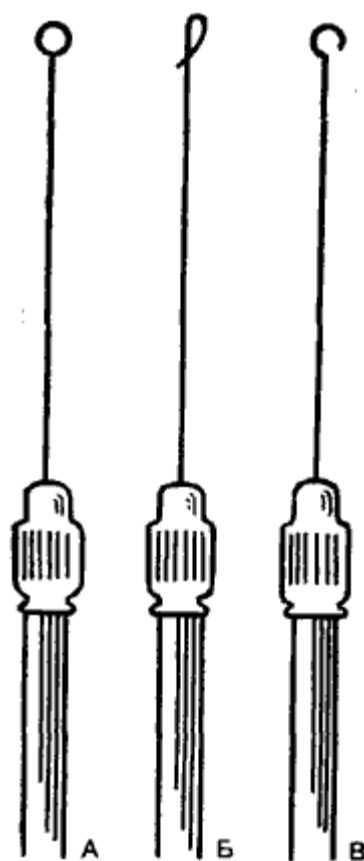
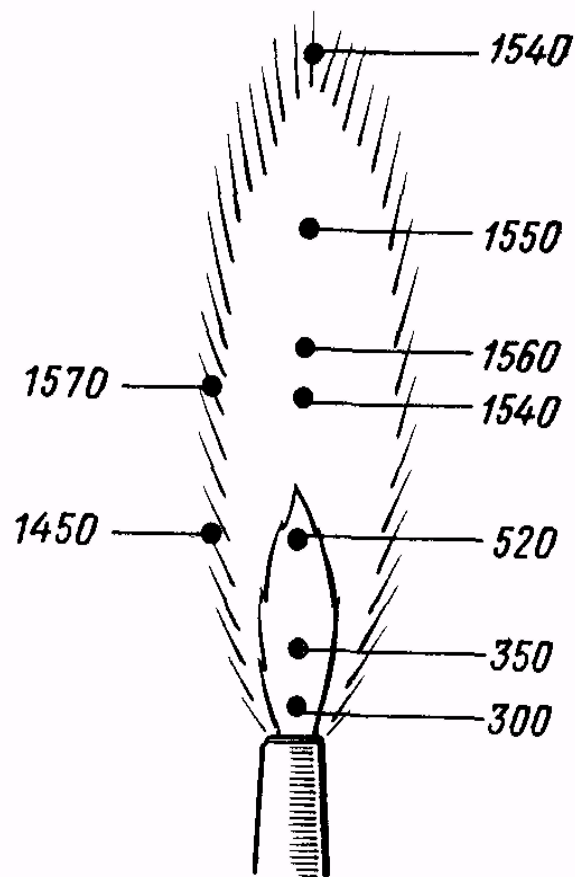
Petri chashkasi va unda mikroorganizmlarni o'stirish

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



Spirit lampasi, gaz gorelkasi va unda to'g'ri ishlash jarayoni

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



Olov turli qismlarining harorati va bakteriologik ilmoq va Dragl'skiy shpatelining ko'rinishi

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



Laboratoriya pipetkalari va uning turlari

MIKROBIOLOGIYA LABORATORIYASI USKUNALARI:



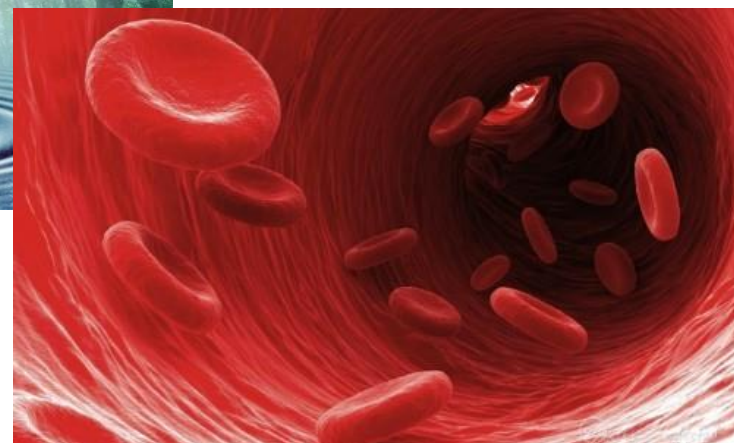
Epindorf



Probirkalar

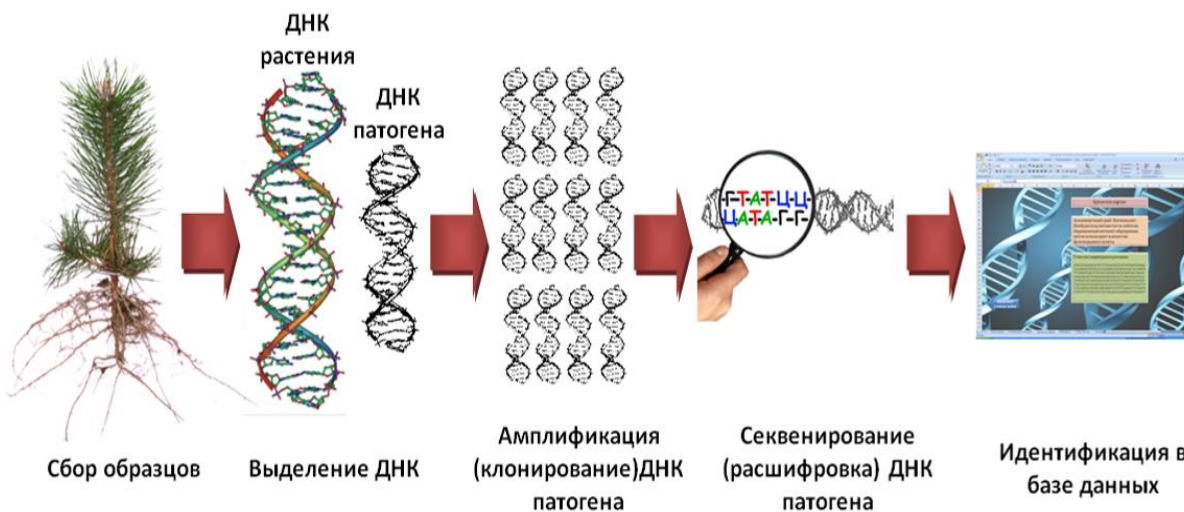
TADQIQOT MATERIALLARI:

- Tuproq
- Suv
- Tirik organizm qoldiqlari
- Qon
- So'lak
- Siydik
- Najas

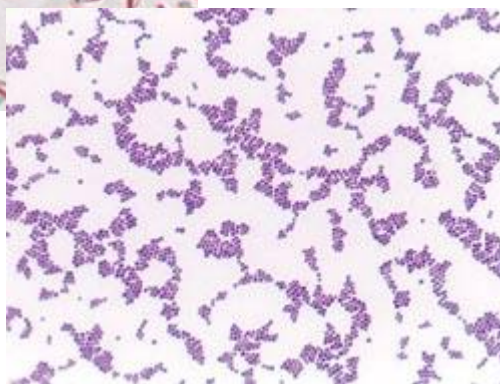
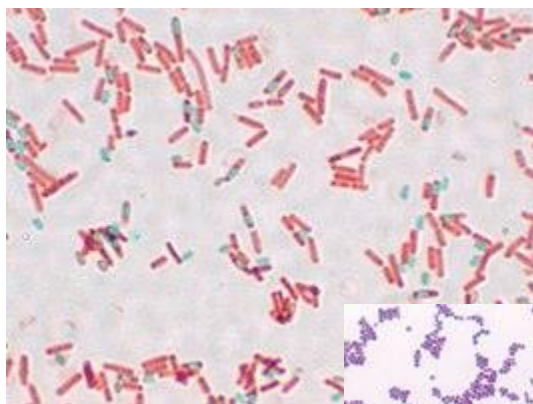


MIKROBIOLOGIYA METODLARI:

- Mikroskopiya
- Bakteriologik
- Biologik
- Molekulyar-genetik
- Serologik

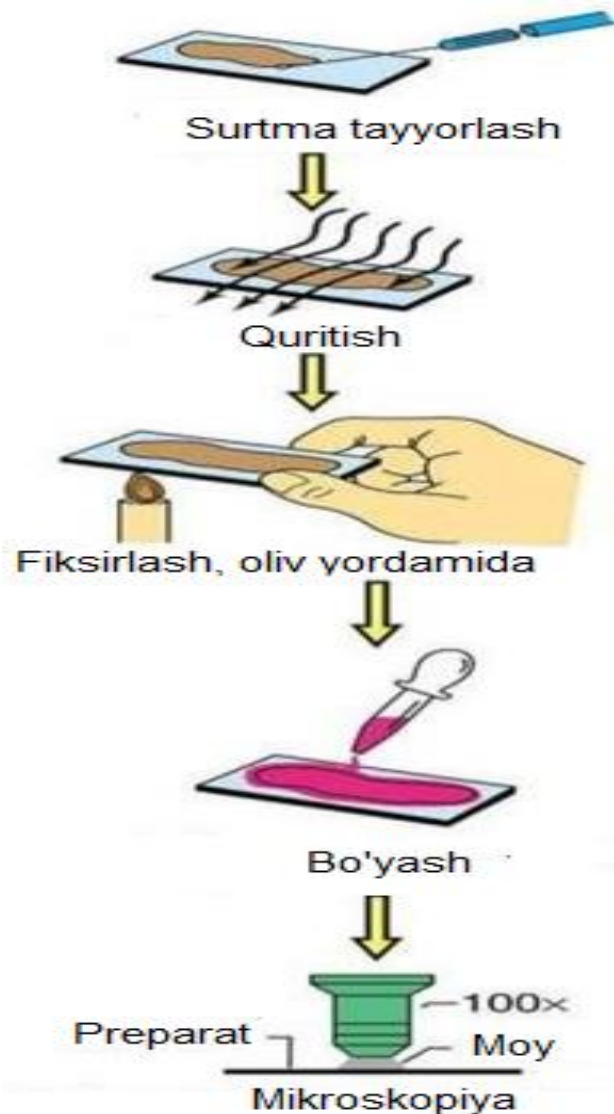


MIKROSKOPIYA USULI:



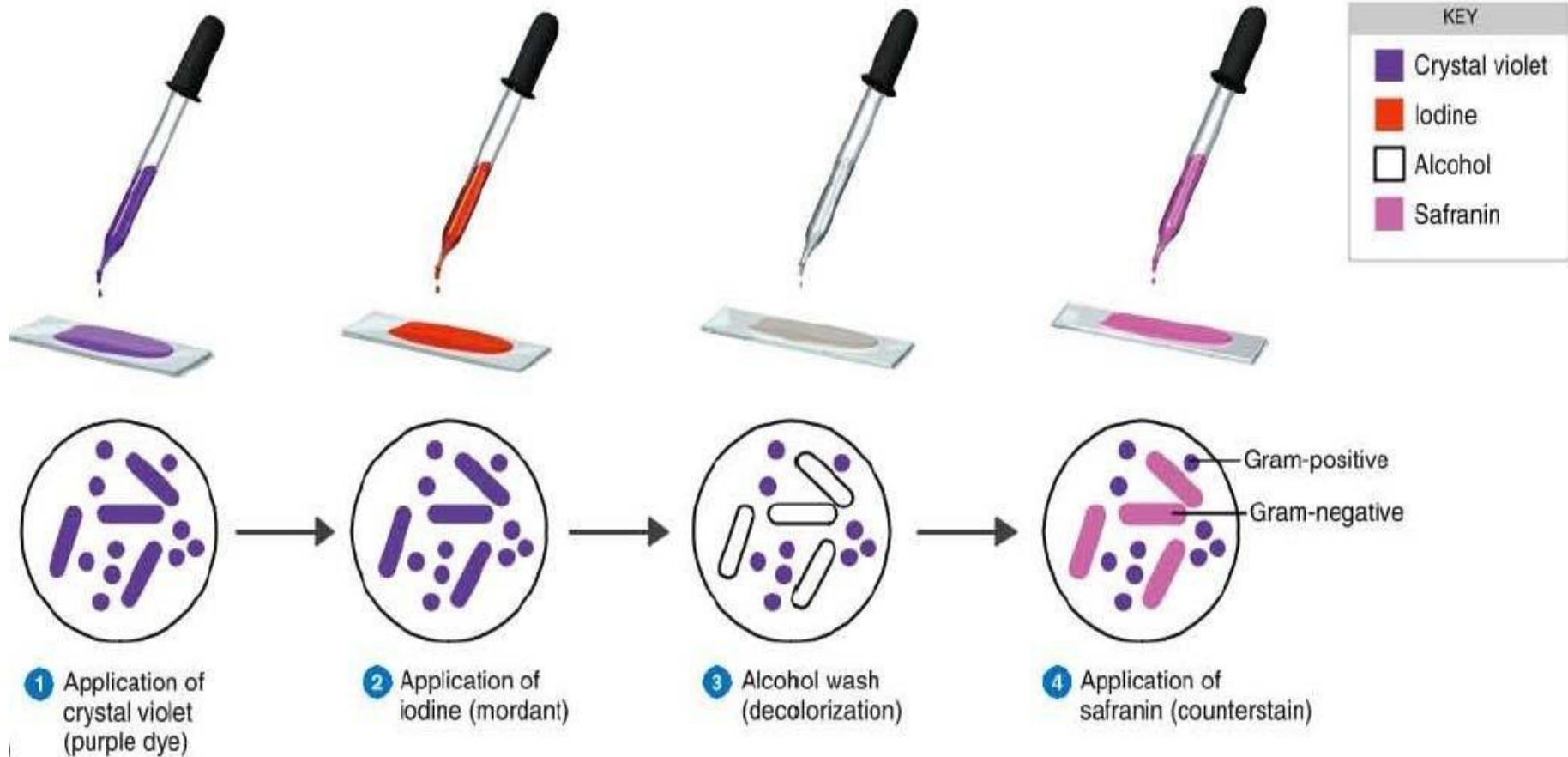
MIKROSKOPIYA TADQIQOT BOSQICHLARI:

- Biologik materialni tayyorlash
- Materialni buyum oynasiga qo'yish
- Surtma tayyorlash
- Quritish
- Fiksirlash
- Bo'yash
- Mikroskopda ko'rish

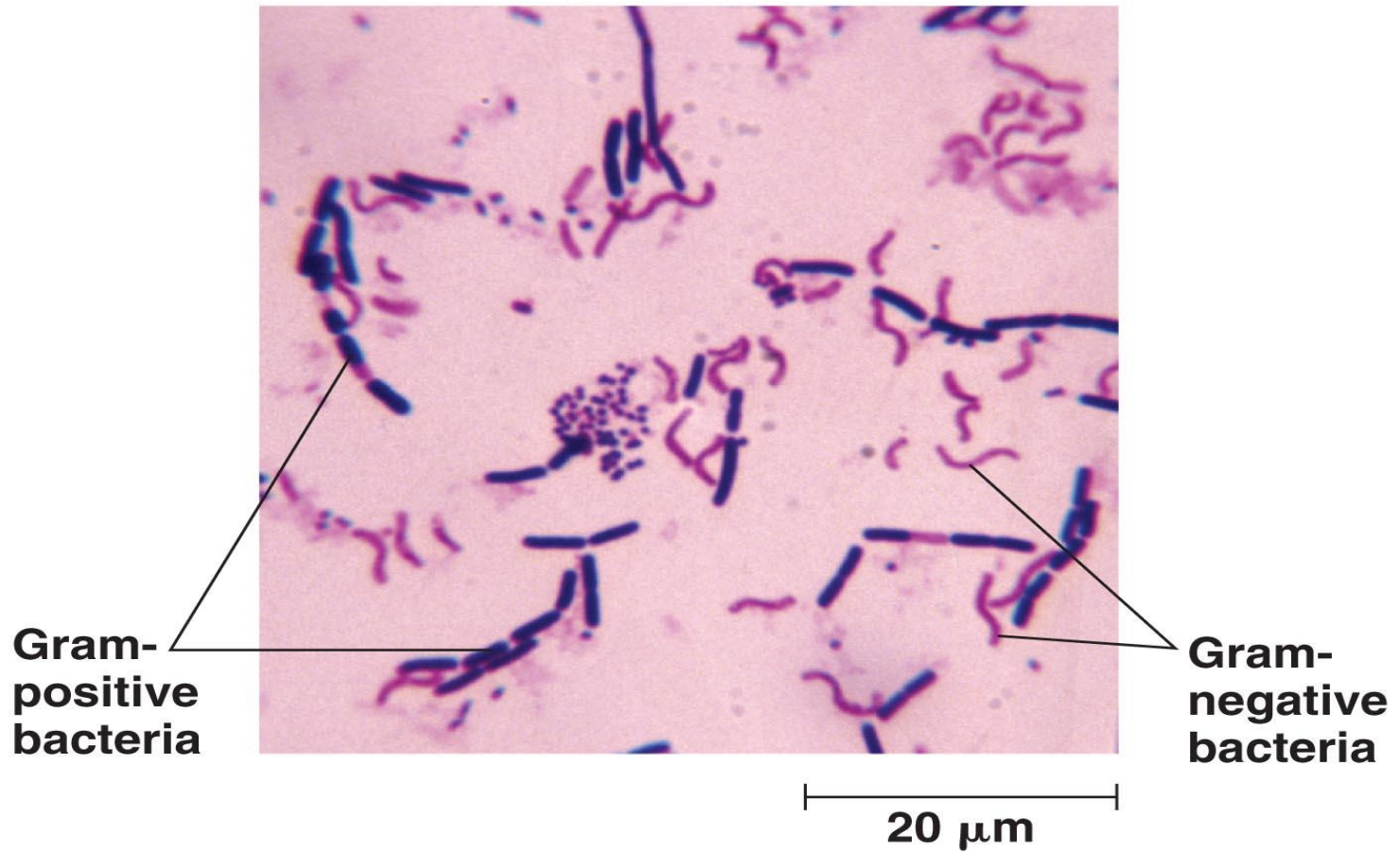


Fiksirlangan, bo'yalgan preparat tayyorlash jarayoni

GRAMM USULIDA BO'YASH:



GRAMM USULIDA BO'YASH:



MIKROSKOPIYA:

- Yorug'lik mikroskopiya
- Lyumenstsensiya
- Elektron mikroskopiya

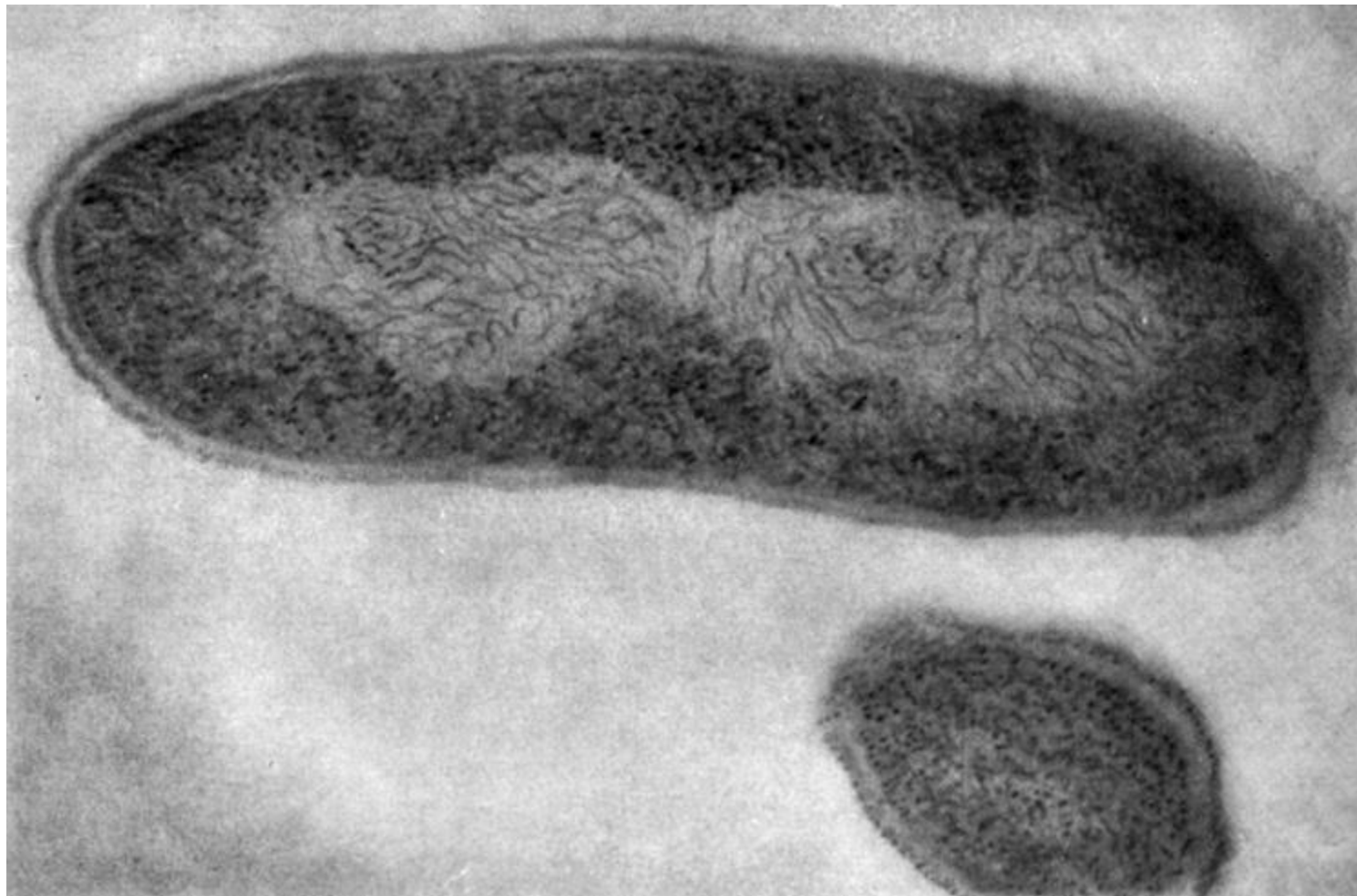


ELEKTRON MIKROSKOPIYA:



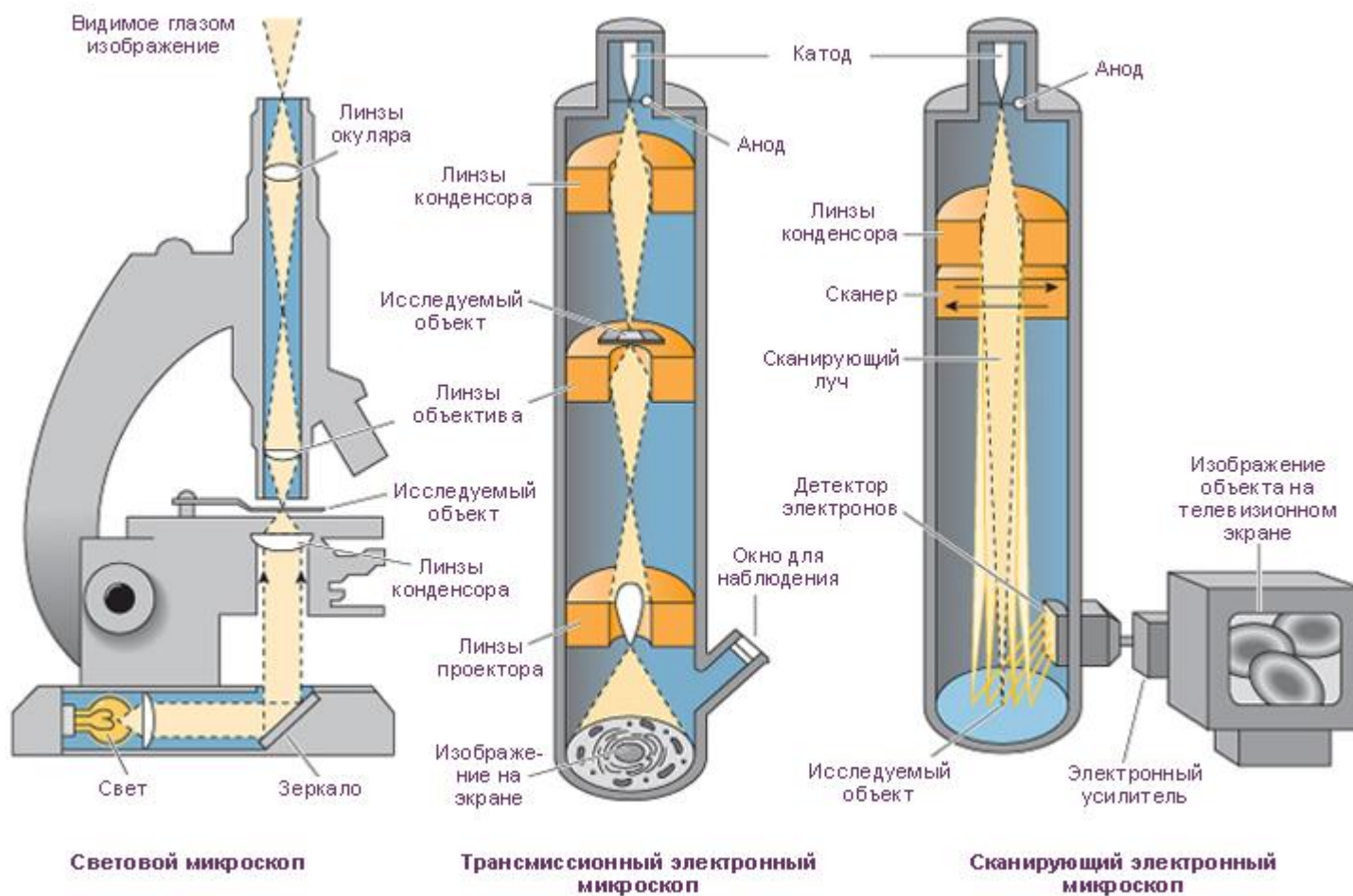
Skanerlovchi elektron mikroskop, model: COXEM, Janubiy Kareya.

ELEKTRON MIKROSKOPIYA:

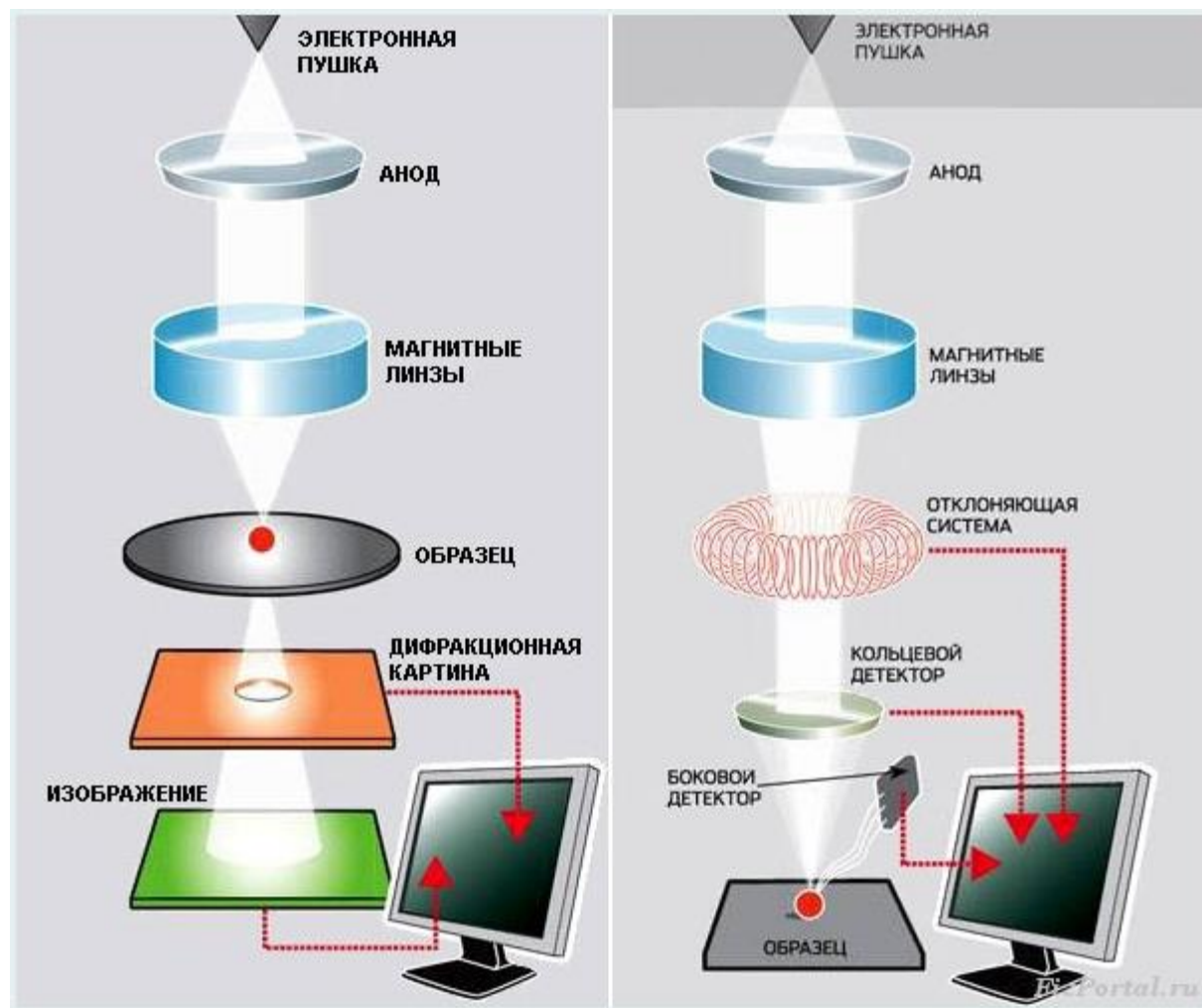


E. coli bakteriyasining elektron mikrofotoqrafiyasi

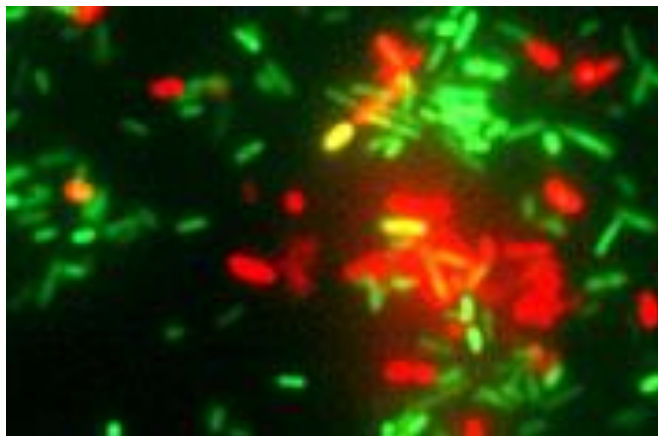
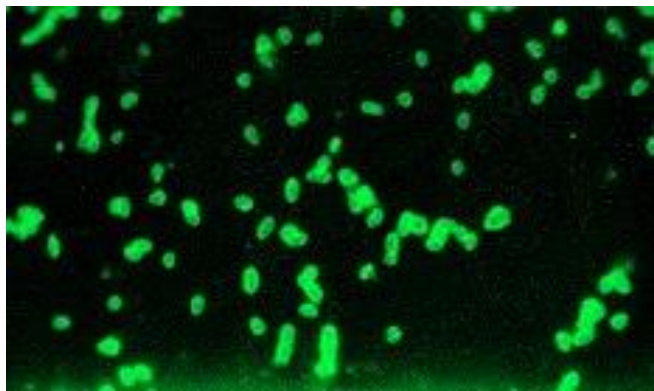
MIKROSKOPDA OBYEKT TASVIRINING HOSIL BO'LISHI SXEMASI:



ELEKTRON MIKROSKOPDA OBYEKT TASVIRINING HOSIL BO'LISHI SXEMASI:



LYUMINISTENT MIKROSKPIYA:



Lyuministsent mikroskop
(Биомед 6 ЛЮМ ПР1)

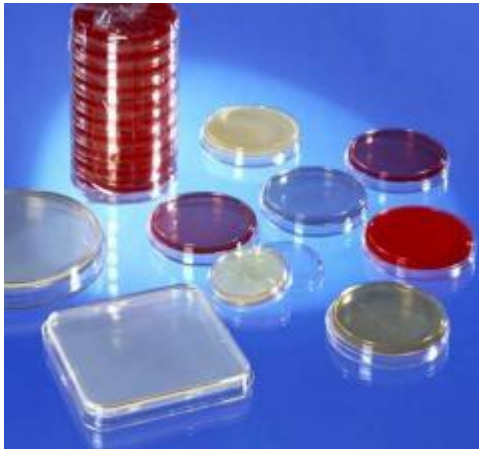
MIKROORGANIZMLARNI O'RGANISHINING BAKTERIOLOGIK USULLARI:

- Bu usul o'z ichiga quyidagi bosqichlarni oladi:
- Mikroorganizmlarni ajratish
- Ko'paytirish
- Identifikatsiya qilishni oladi.

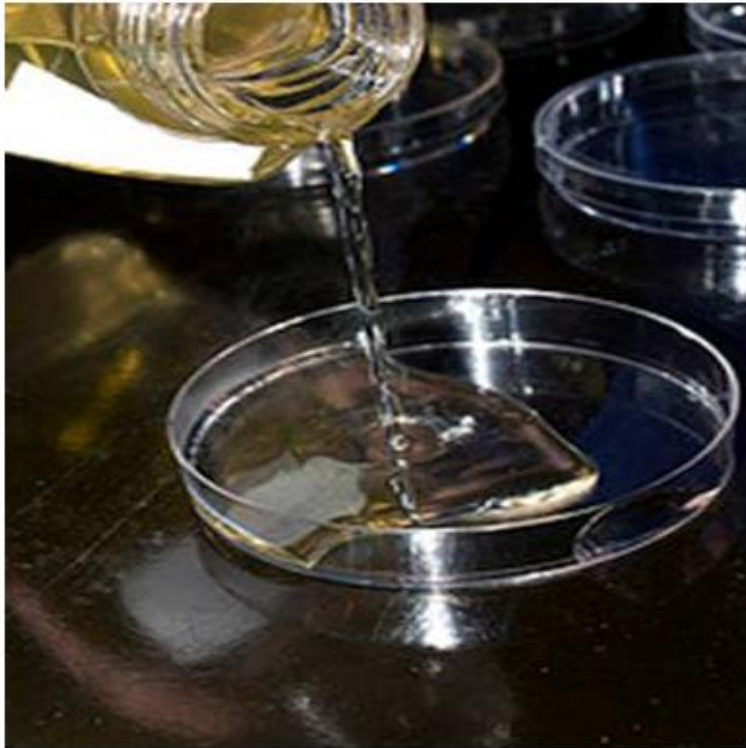
Mikroorganizmlarni ajrtishning bugungi kungacha bir qator turlari ishlatilib kelinmoqda. Ulardan eng ko'p ishlatiladigani qattiq ozuqa mihi yordamida ajratish hisoblanadi. Shunday ekan, mikrobiologiyada ozuqa muhitlarining ahamiyati beqiyosa hisoblanadi. Shuning uchun quyida ozuqa muhitlariga to'xtalib o'tamiz.

OZUQA MUHIT TURLARI:

- Universal
- Differensial-diagnostik
- Selektiv
- Maxsus
- Suyuq
- Yariq suyuq

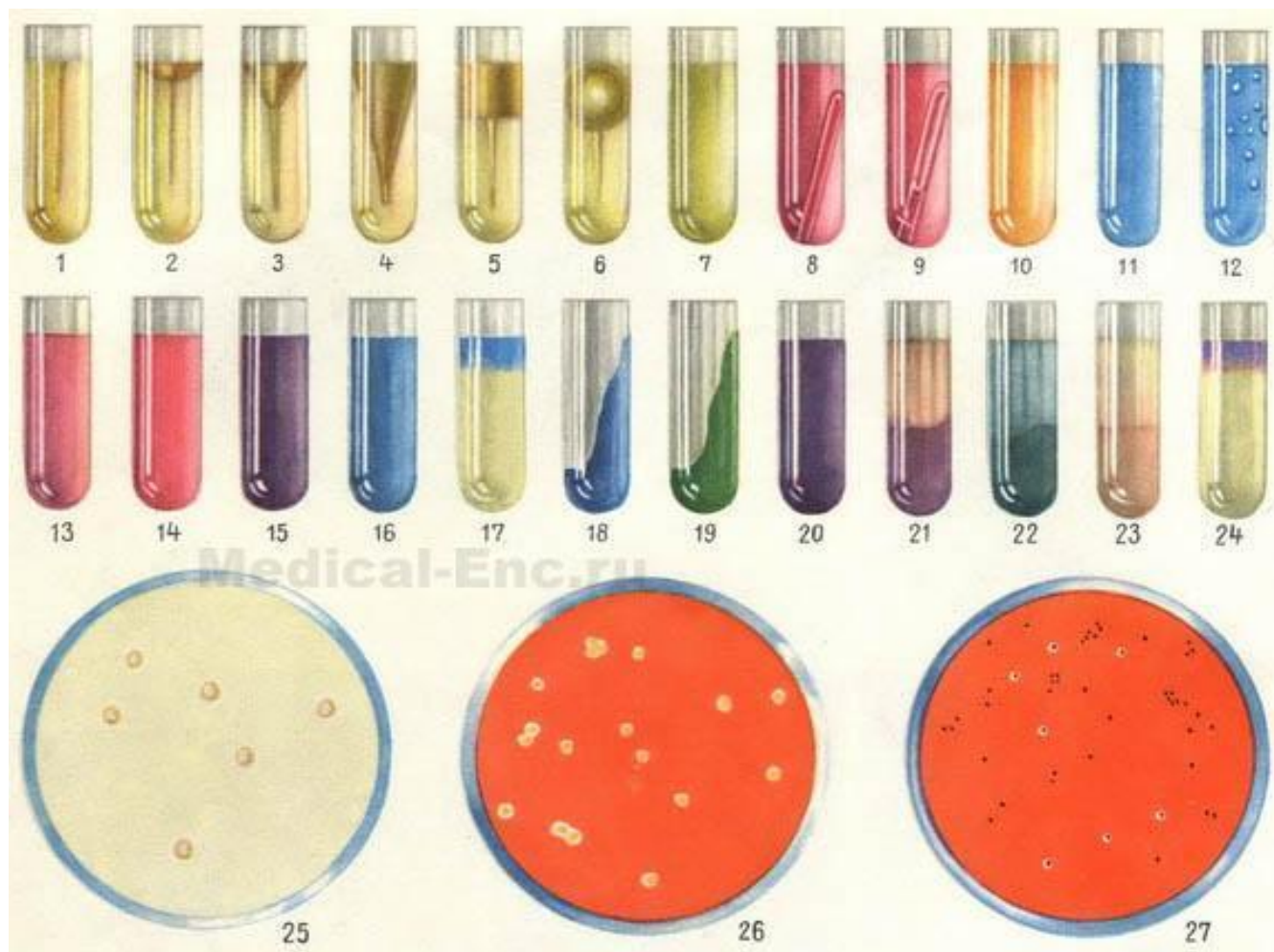


ODDIY (UNIVERSAL, ASOSIY)OZUQA MUHITLARI:



- GO'SHTLI-PEPTON BULYONI (**GPB**)-suyuq ozuqa
- GO'SHTLI-PEPTON AGARI (**GPA**) –qattiq ozuqa
- Ko'pgina bakteriyalar o'sishini ta'minlaydi
- Murakkab ozuqa muhitlarini tayyorlashda asos bo'lib xizmat qiladi.

DIFFERENSIAL-DIAGNOSTIK OZUQALAR:



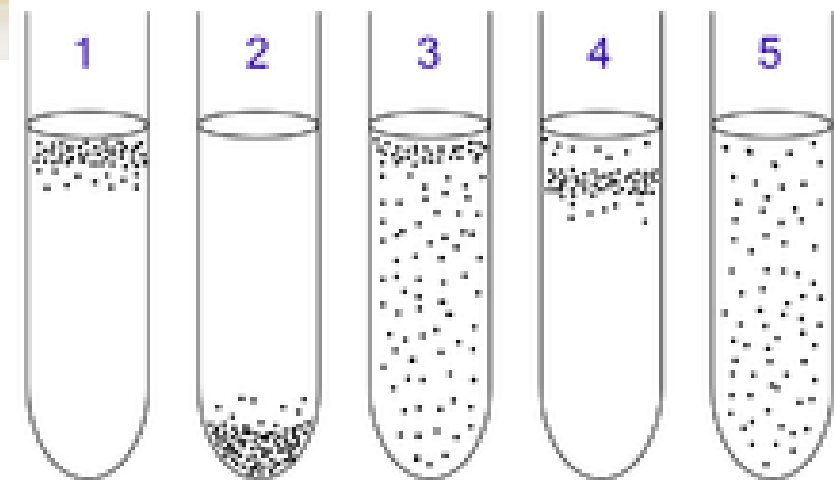
SELEKTIV OZUQALAR:

- **Pepton buloni** – ammonifikatorlar uchun
- **Vinogradskiy muhiti** - nitrifikatorlar uchun
- **Giltay muhiti** - denitrifikatorlar
- **Eshbi muhiti** - erkin yashovchi azotfiksatorlar uchun
- **Rushman muhiti** - moy kislotali bakteriyalar uchun
- Kletchatkani aerob parchalovchilar uchun
Getchinson va Kleyton muhiti

MIKROORGANIZMLARNI AJRATISH USULLARI:

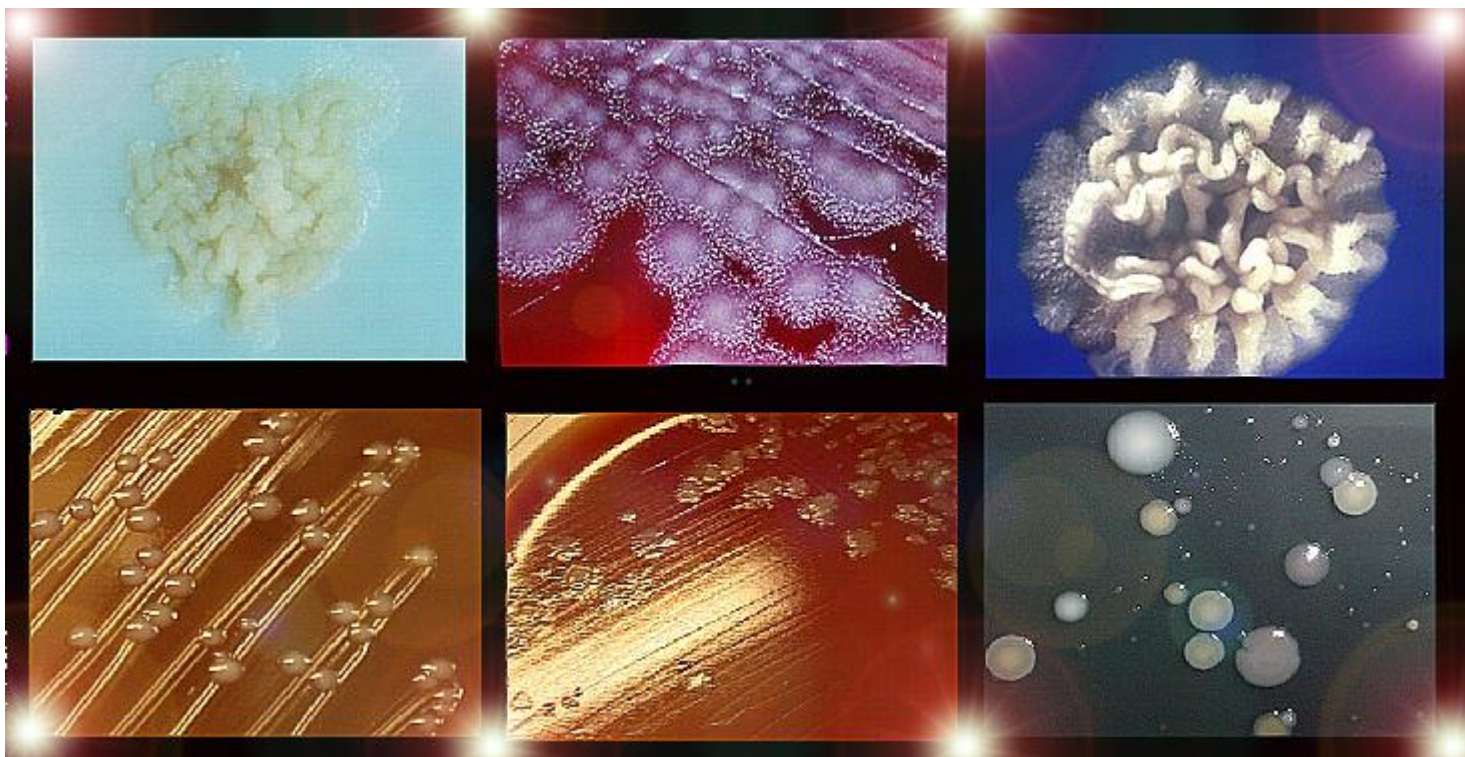


- Qattiq ozuqa muhiti yuzasida o'stirish
- Ozuqa muhiti qatlamida o'stirish

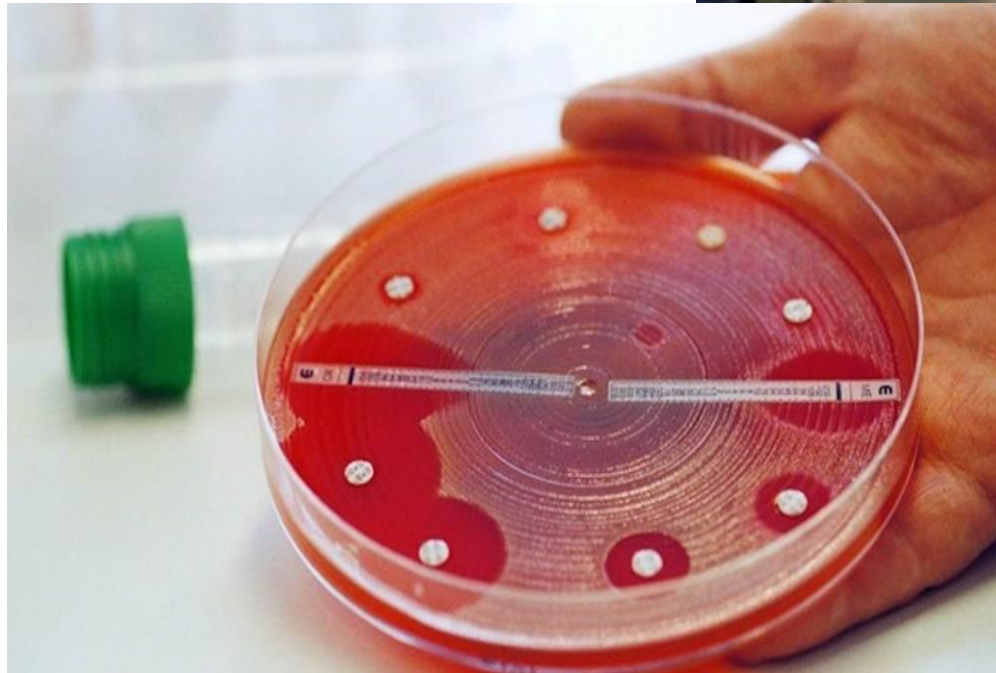
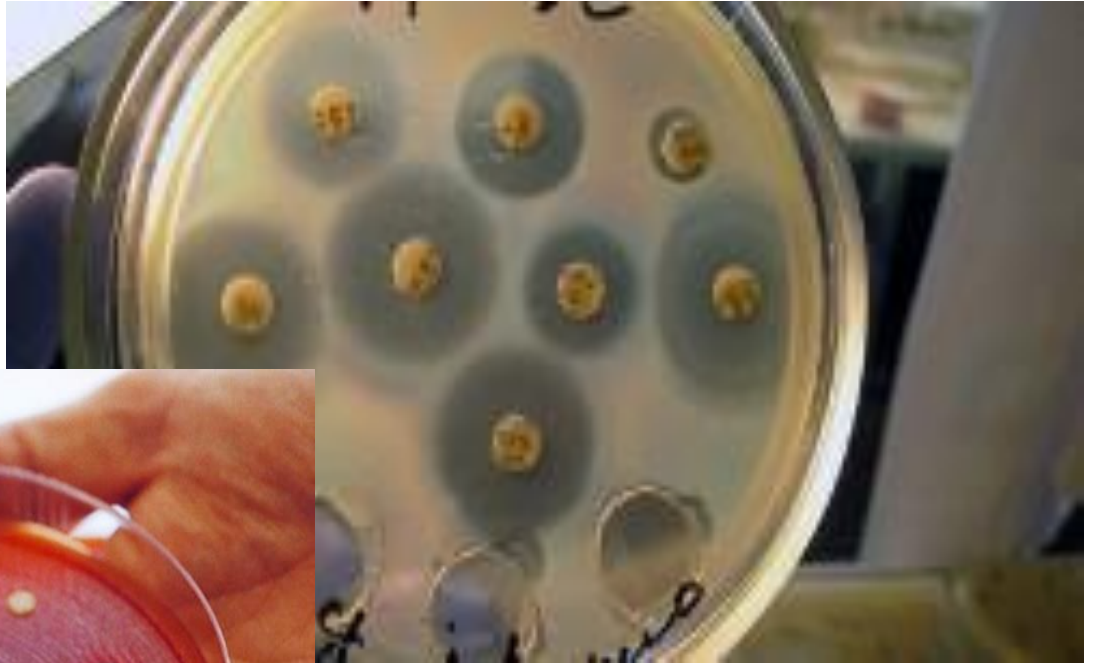


IDENTIFIKASIYA QILISH:

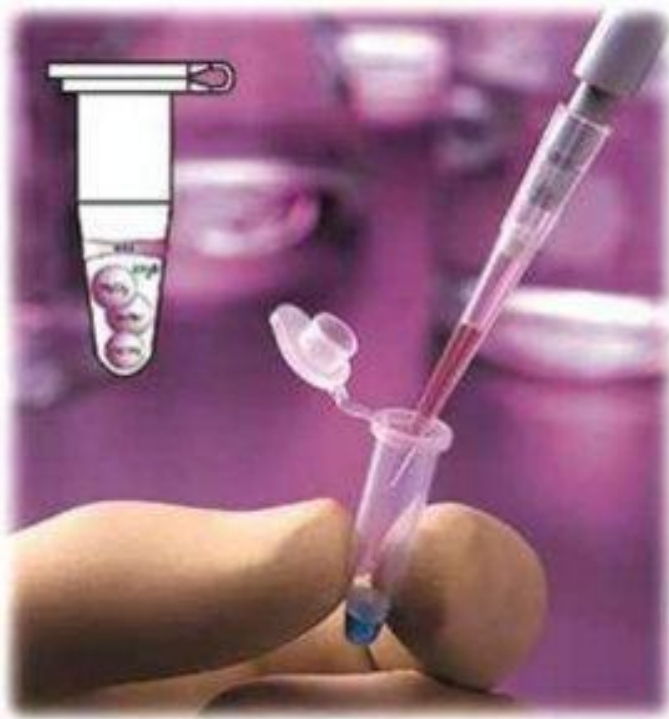
- Koloniya morfologiyasiga asoslangan
- Biokimyoviy identifikasiya
- Molekulyar-genetik identifikatsiya



ANTIBIOTIKKA SEZGIRLIGINI ANIQLASH:

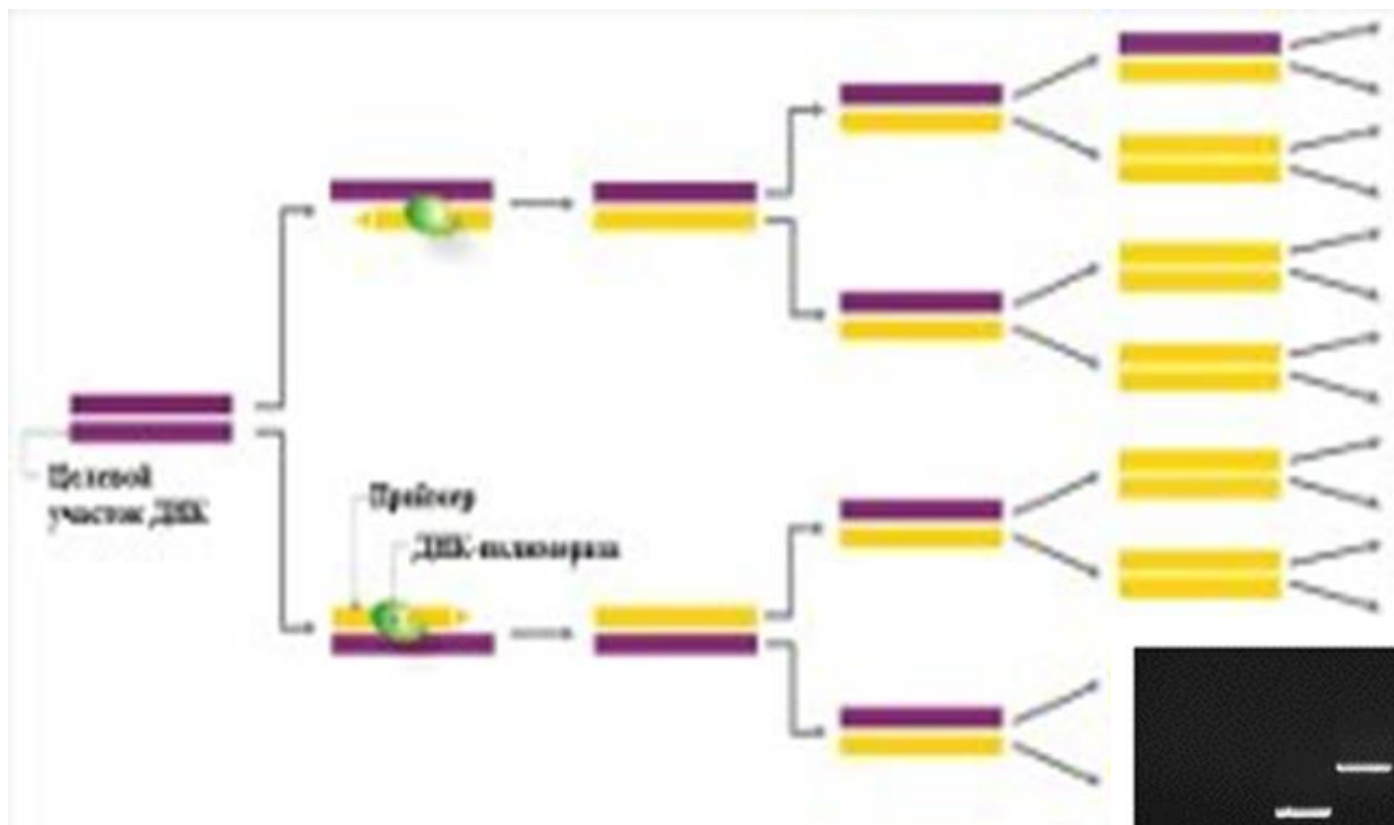


MOLEKULAR-GENETIK IDENTIFIKATSIYA:

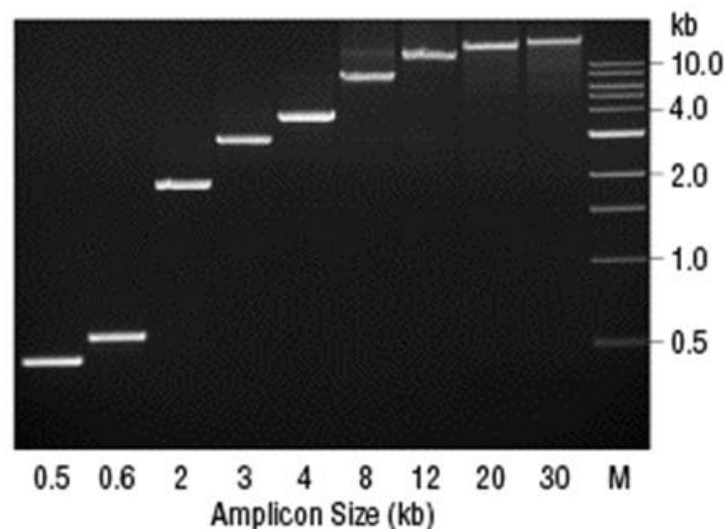


PSR amplifikator qurilmasi:

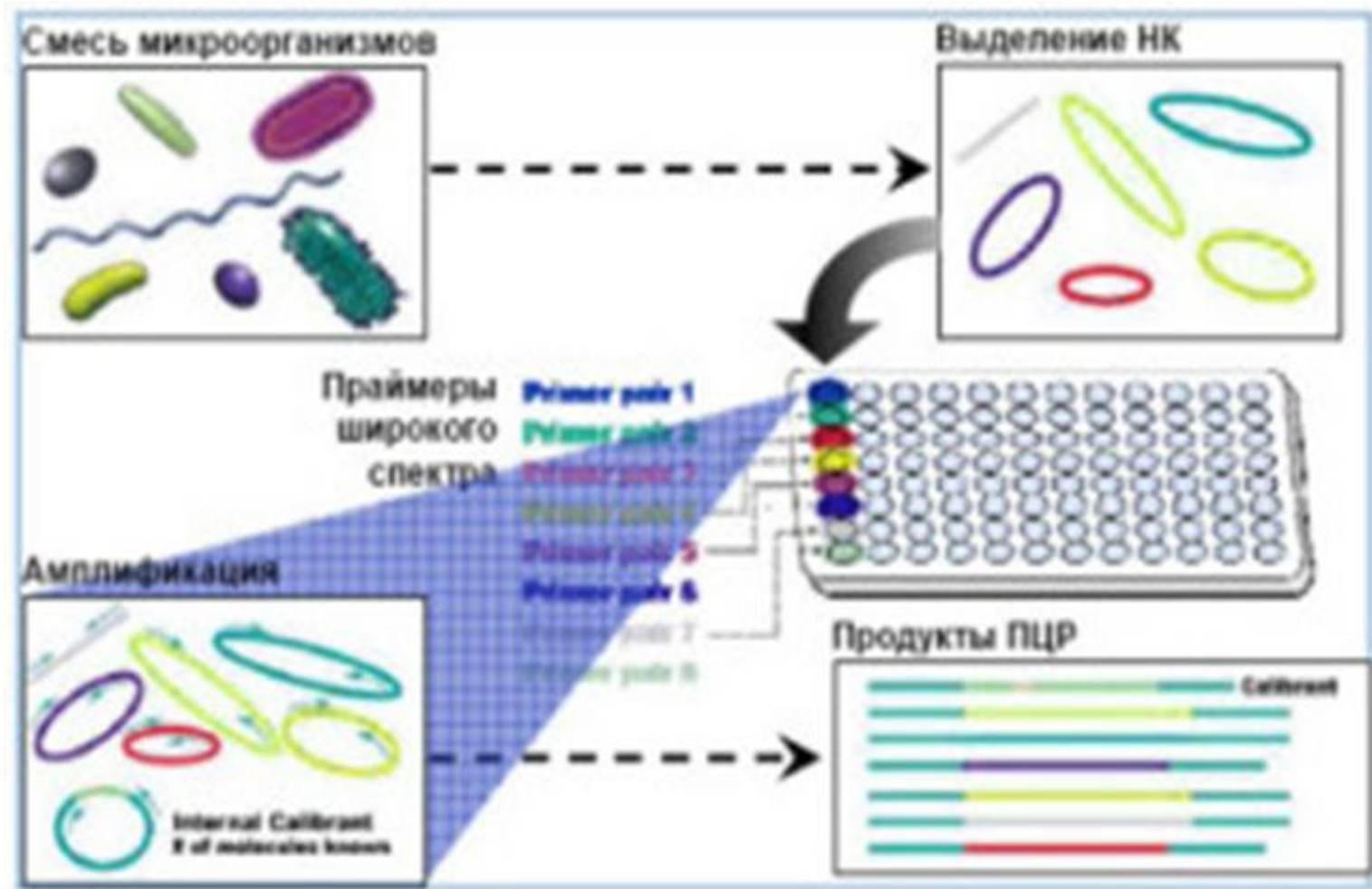
MOLEKULAR-GENETIK IDENTIFIKATSIYA:



PSR jarayonida DNK molekulasining ko'payish sxemasi va mahsulotning gelda taqsimlanishi:



MOLEKULAR-GENETIK IDENTIFIKATSIYA:

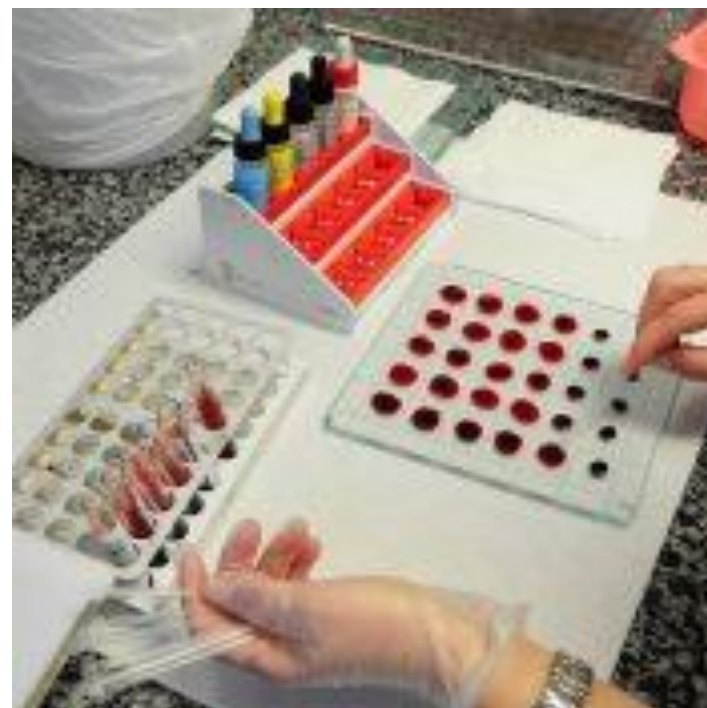
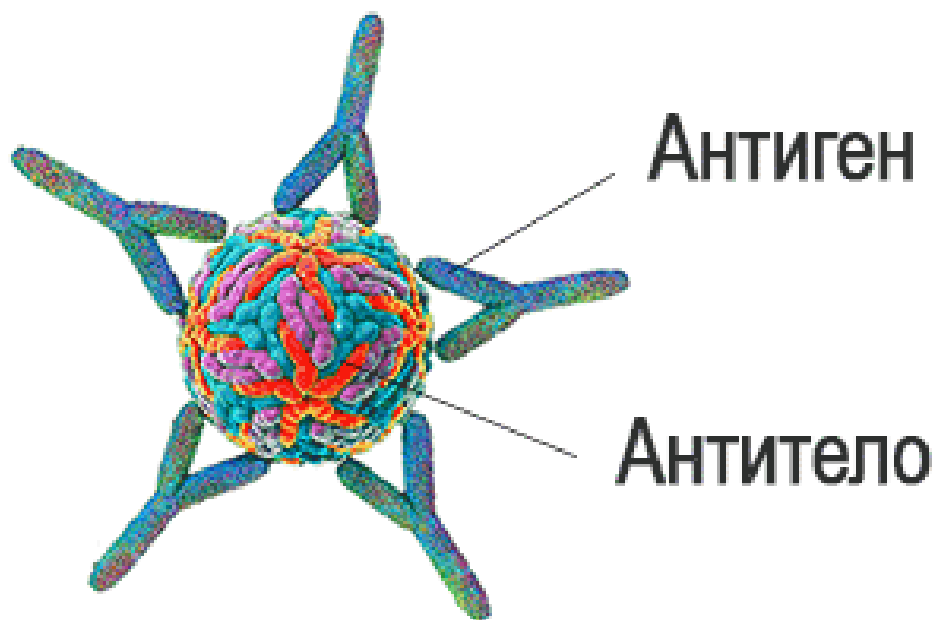


Mikroorganizmlarni PSR yordamida identifikatsiya qilish sxemasi:

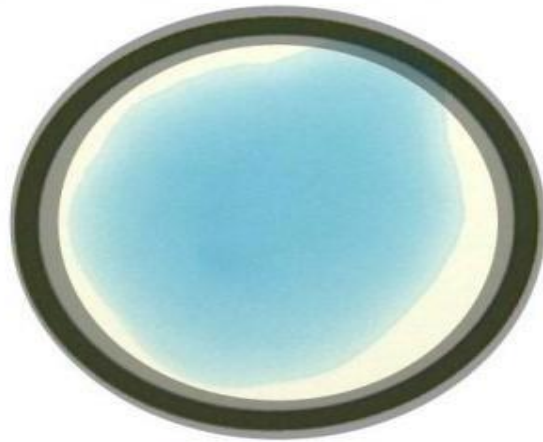
BIOLOGIK METODLAR:



SEROLOGIK METODLAR:



TOMCHI USULI:

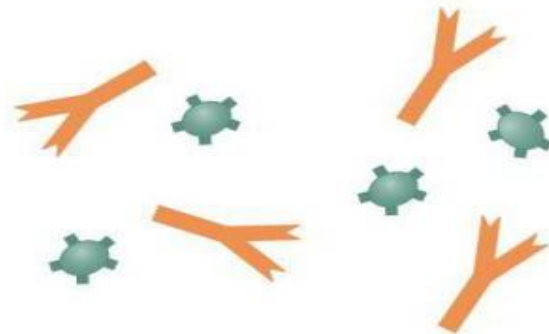


Negative result

(a)

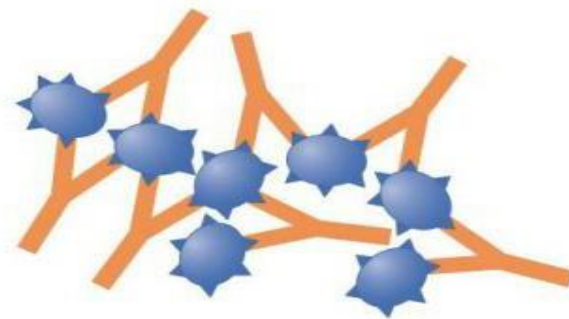


Positive result



Negative result

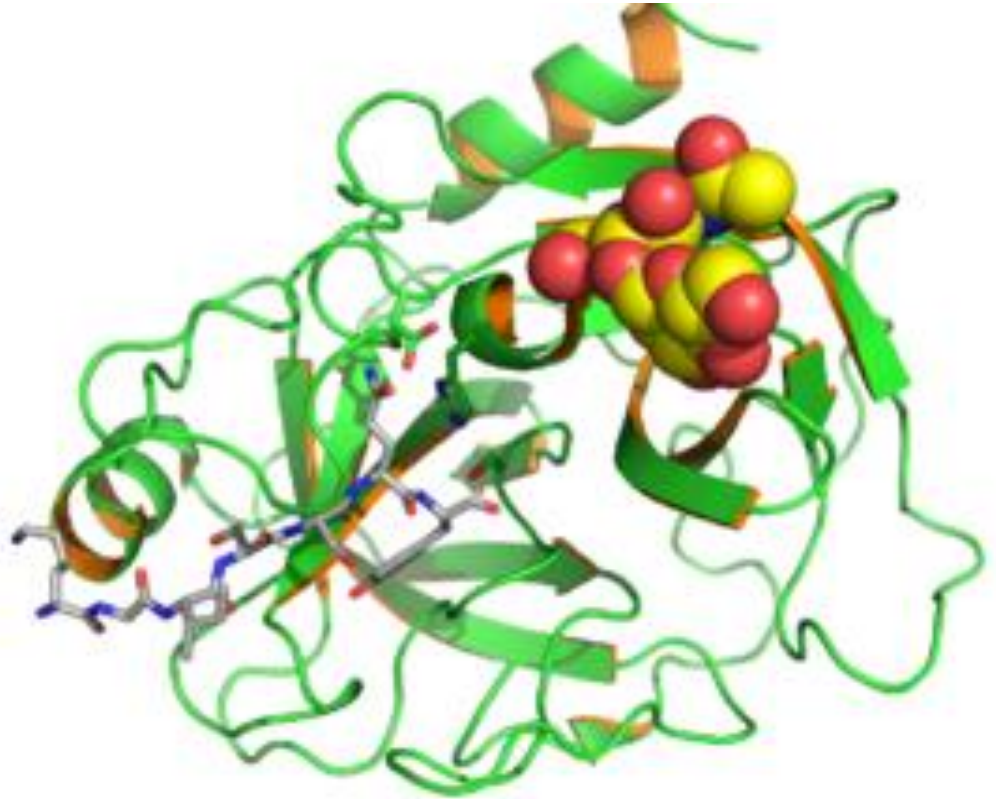
(b)



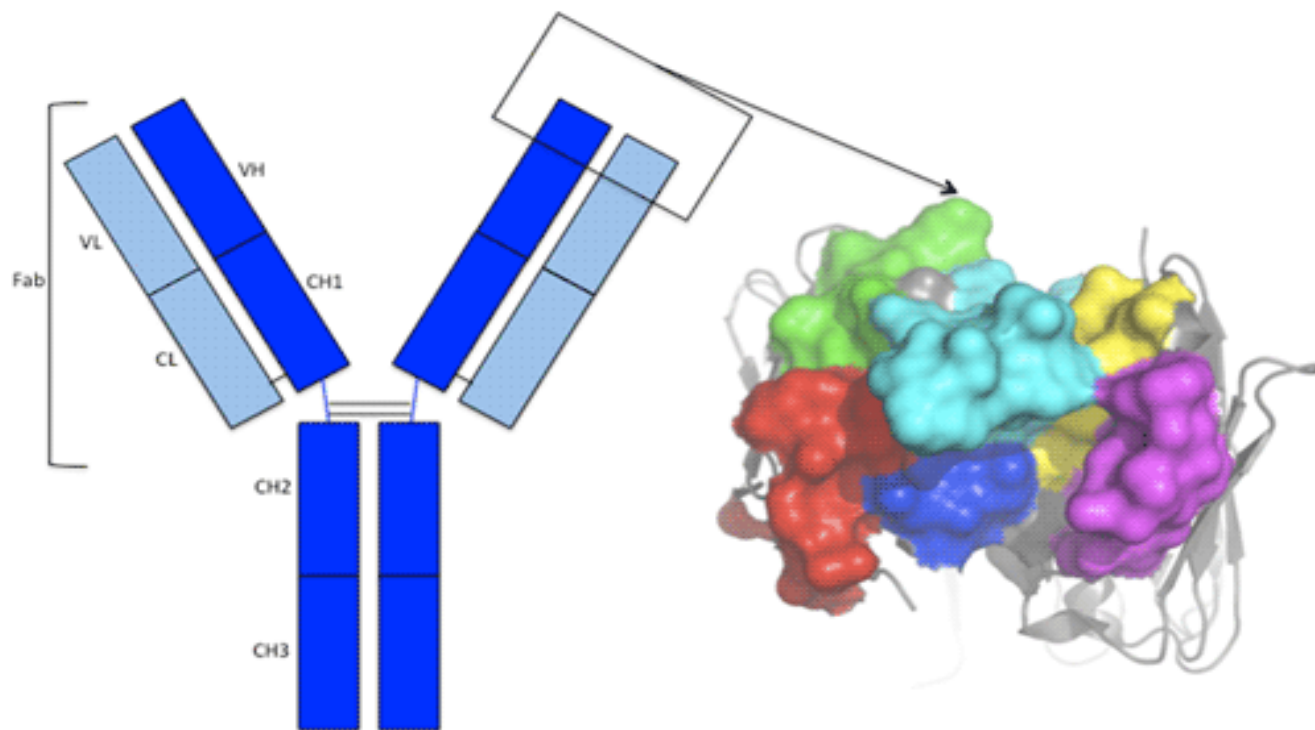
Positive result

ANTIGENLAR:

- Oqsillar
- Polisaxaridlar
- Nuklein kislotalar
- Gaptenlar

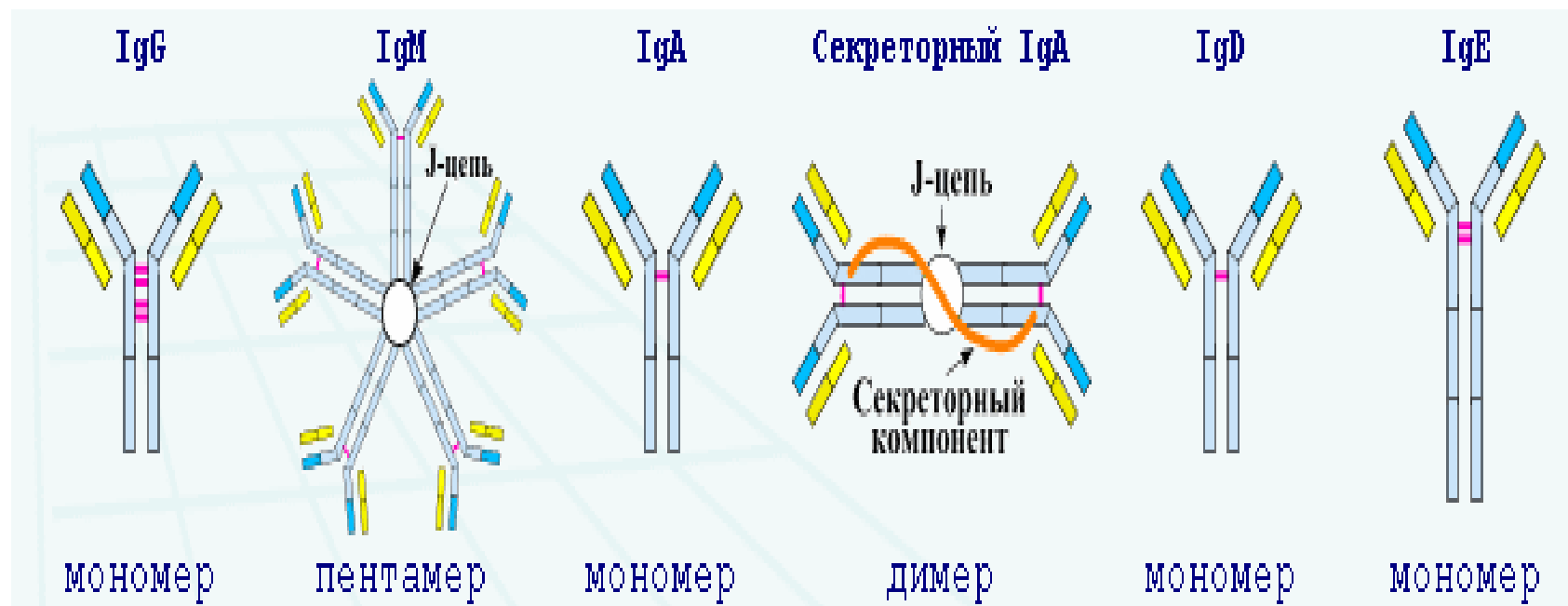


ANTITELO:



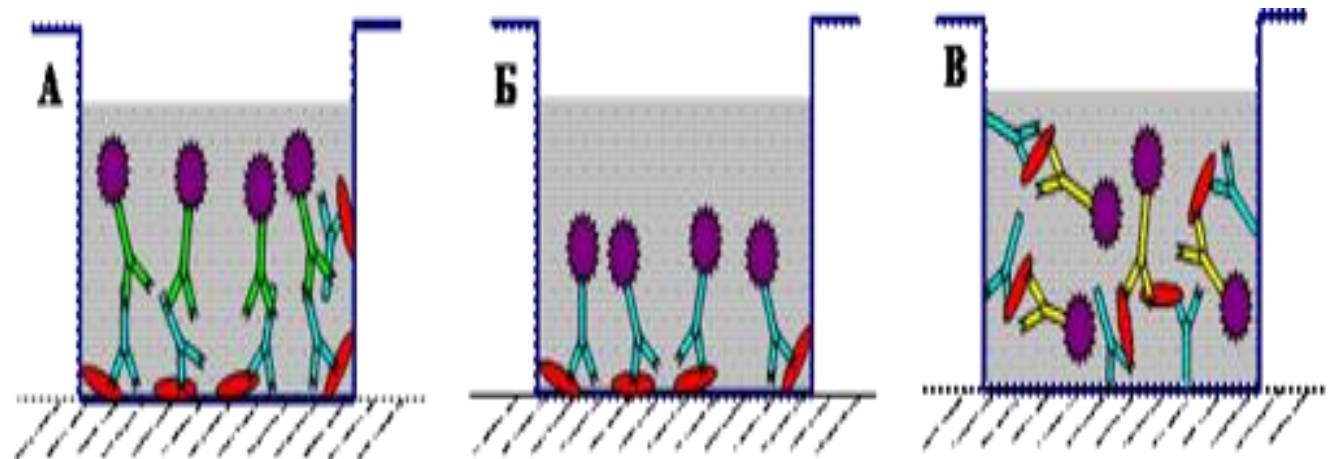
Antitana va uning umumiy ko'rinishi:

ANTITELO TURLARI:

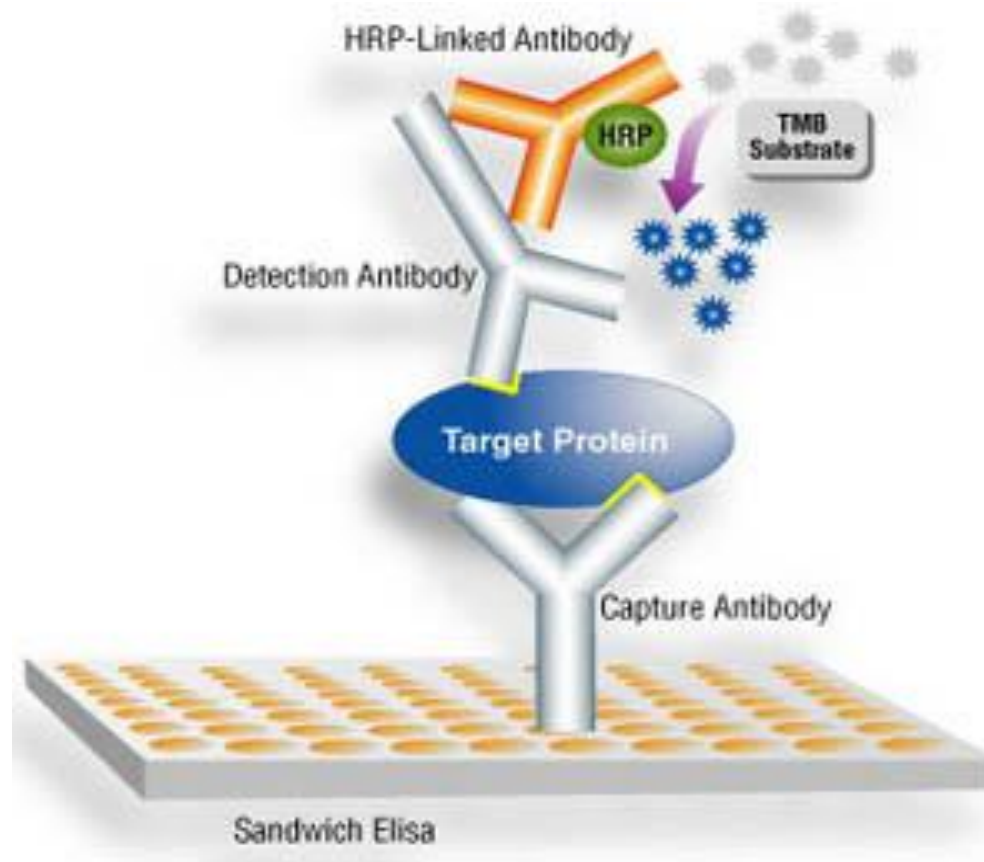


Antitanalarga mansub bo'lgan immunoglobulinlar:

IMMUNOFERMENT ANALIZ:



IMMUNOFERMENT ANALIZI:



IFA sendvich variant va uning sxematik ko'rinishi:

E'TIBORINGIZ UCHUN RAHMAT!