

⊗ Principles of Diagnosis of Viral Infections

• Viral infections can be diagnosed using 6 main approaches, ranging from direct detection of the virus to indirect immune evidence.

The 6 methods:

- 1- Virus Culture
- 2- Serology
- 3- Antigen detection
- 4- Molecular detection (PCR)
- 5- Histopathologic examination of cells or tissue infected by the virus
- 6- Clinical diagnosis

① Virus Culture

→ Considered the gold standard (reference method)

→ Not routinely used why??

because: Many viruses difficult to culture

Time consuming (Slow)

Requires specialized labs

Virus culture is complex process



Accurate but not practical for acute diagnosis

② Serology (Antibody Detection)

→ Blood is 2 parts (Cells + fluid that have proteins)

→ The fluid part is called serum

→ Detects antibodies in serum (IgM, IgG)

→ Antibodies are virus specific

→ Antibody is also called immunoglobulin

• IgM

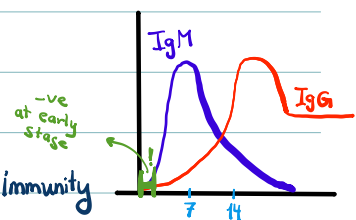
Appears after 1-2 Weeks

Indicates recent or acute infections

• IgG

Appears within weeks to months

Persists long term → Past infection or immunity



✗ Not useful for early diagnosis (Antibodies take time to form)

③ Antigen Detection

- Detects viral proteins (antigens) directly from samples.
- Useful in early infection before antibodies appear.
- Common in respiratory viral infections ex: Influenza like illness

 positive nasopharyngeal antigen test = virus proteins present

④ Molecular detection

- Detects viral DNA or RNA
- polymerase Chain Reaction (PCR) is the most commonly used method
- Highly sensitive and specific

 PCR amplifies a specific targeted sequence Not any random DNA

⑤ Histopathology & Immunohistochemistry

- Examines virus induced cellular changes in tissues
- Immunohistochemistry uses antibodies to detect viral antigens in tissue
-  May show evidence of infection even when virus is no longer detectable.

⑥ Clinical diagnosis

- Based on signs and symptoms
- Some viral diseases have characteristic clinical pictures.