

VIROLOGY

DIRECT EXAMINATION : MICROSCOPICAL EXAMINATION ELECTRON MICROSCOPY EXAMINATION



Sawa University

College of health and medical techniques

Department of Medical Laboratories

. Three :Stage

جامعة ساوة الاهلية

كلية التقنيات الصحية والطبية

قسم تقنيات المختبرات الطبية

المرحلة الثالثة

...محاضرة رقم 3...

Lecture No.3 ..

الجانب العملي

Practical

تدريسي المادة : م. د. سيف علي

In the laboratory the following methods are commonly employed, microscopic demonstration of the **virus** or **its inclusion body**.

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Demonstration of virus antigen, or detection of the specific antibody & molecular techniques. Microscopy It includes:

1. Detection of viral inclusion body by light microscopy
2. Detection of virus or viral particles with the help of electron microscope.

Light Microscopy

Light Microscopy has been traditionally used in directly demonstrating viral infections by detecting the viral inclusion body in smear & tissue.

Inclusion bodies :- are dense aggregates of stainable substances, usually proteins. They can be either intranuclear (present inside the nucleus) of infected well or intracytoplasmic (present inside the cytoplasm of infected cell).

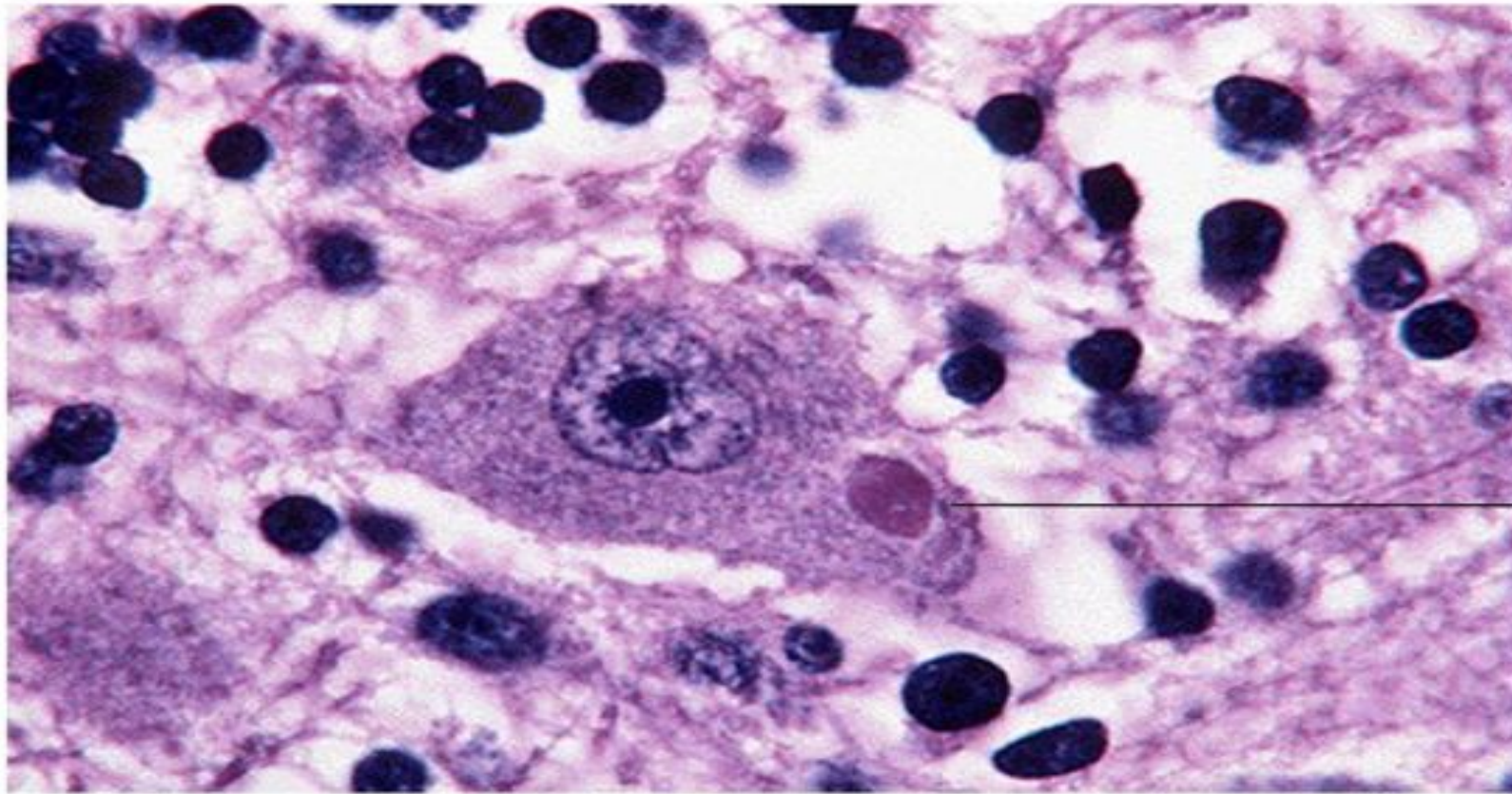
Viruses that(usually DNA viruses) like herpes simplex viruses, Varicella zoster virus, Cytomegalo virus, adeno virus & papova viruses forms intranucleus inclusions.

While viruses that are assembled in the cytoplasm (usually RNA viruses) like Respiratory syncytial virus, rabies virus & viruses of the pox group forms intra cytoplasmic inclusion bodies.

The intracytoplasmic lesions of rabies virus are known as Negri bodies, intracytoplasmic inclusions of the pox viruses known as Guarneri bodies

Negri bodies

can be seen with a light microscope. A section through a Purkinje cell with Negri body in the cytoplasm



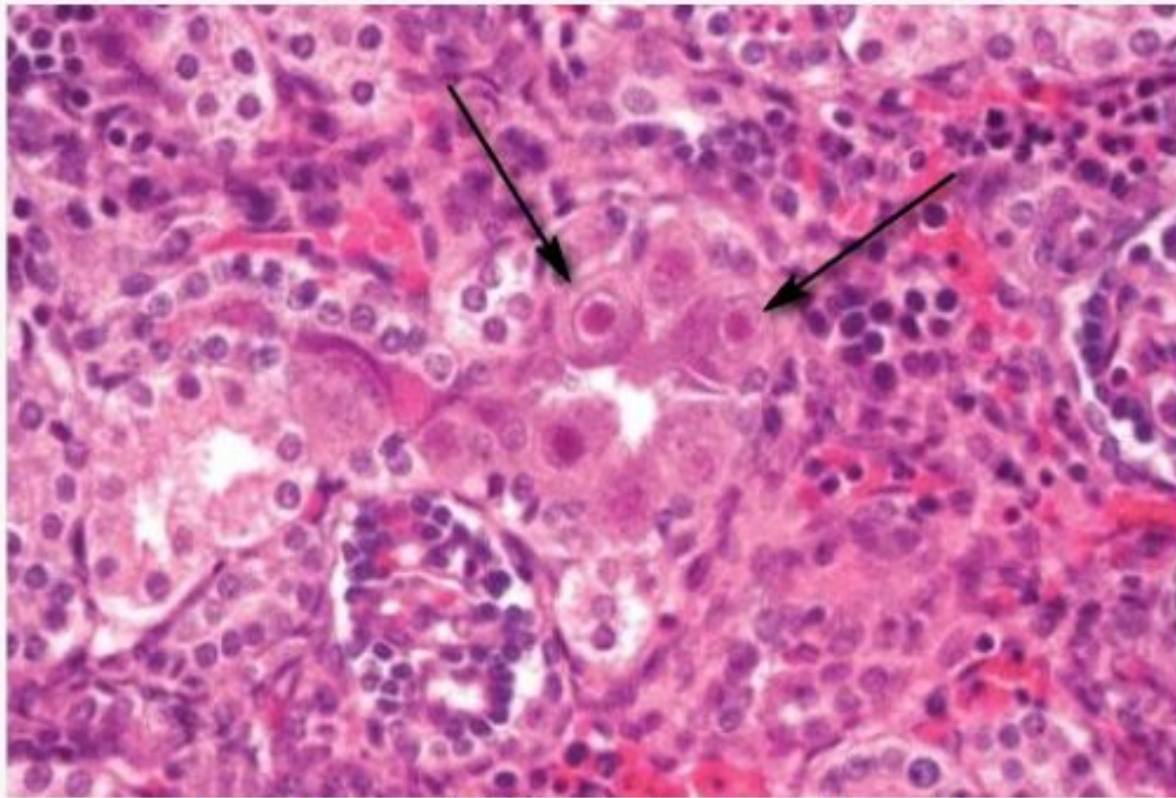
Negri body

Figure1:Negri bodies

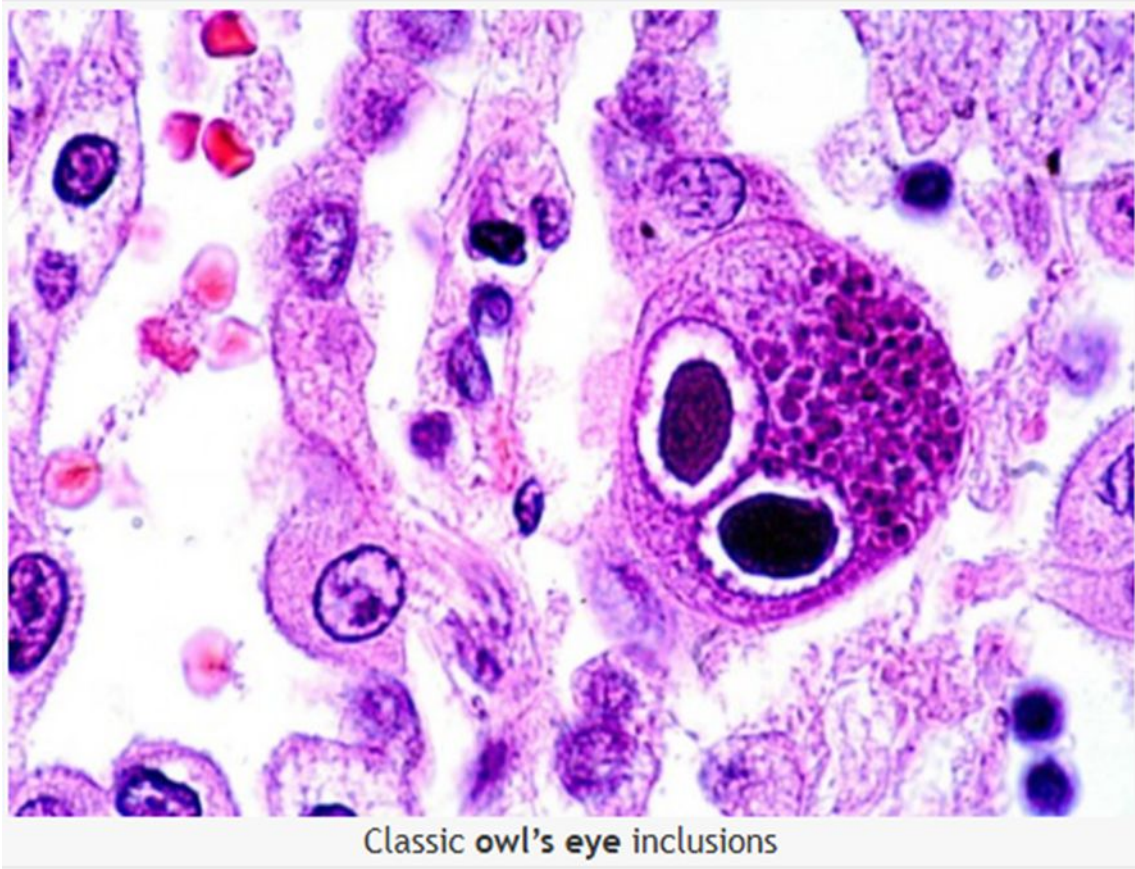
Guarneri bodies



poxviruses affecting humans

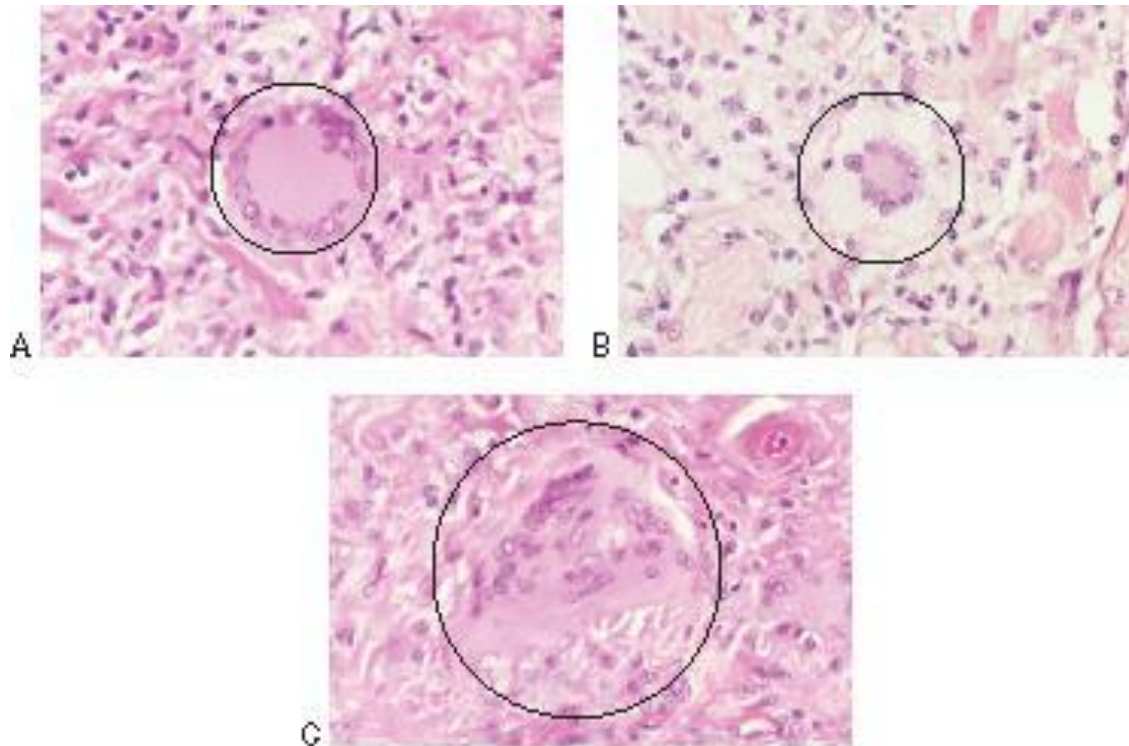


Cytomegalovirus (CMV) Inclusions resemble owl's eyes



Giant cell inclusion bodies:-

are aggregates of proteins or other substances that can be found within giant cells, which are large cells formed from the fusion of multiple cells. These inclusions can be a sign of infection (like Cytomegalovirus).

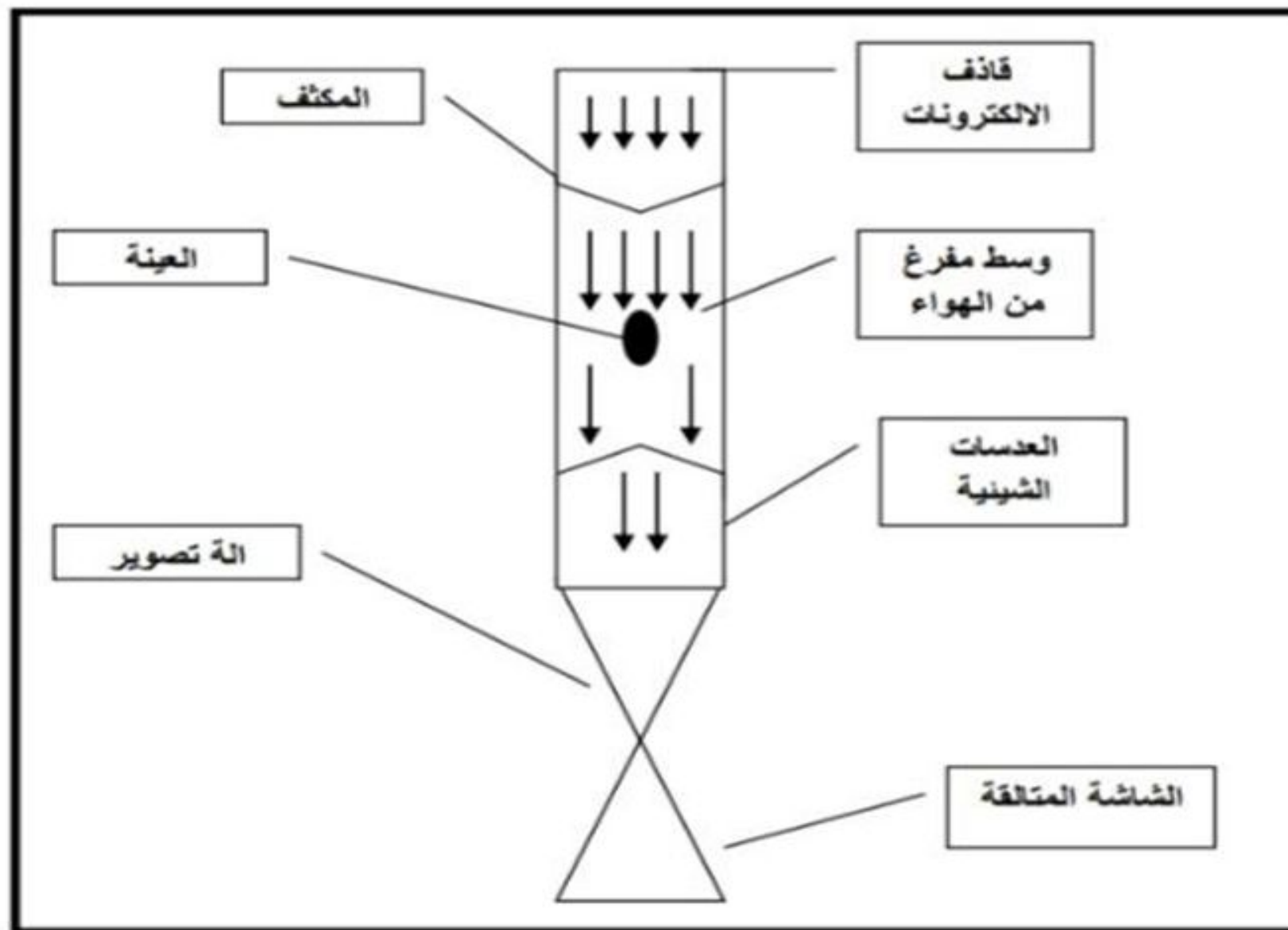


Electron Microscopy is used in the study of clinical specimens & cell cultures, has been used effectively in the detection of viral agent of gastro enteritis especially those that are not recovered by conventional cell cultures.

Electron microscopes are useful in ultra structural observations especially for research purposes. The diagnosis of important viral infections, such smallpox, can be made quickly & safely with help of Electron microscopy

Electron Microscopy It consists of:-

- 1- Electron gun
- 2- Electromagnetic lenses, including:
 - A. Condenser Lenses
 - B. Objective Lenses
 - C. Projector Lenses
- 3- Brilliant screen
- 4- Camera
- 5- Air degassing device
- 6- Voltage scaling device



Some of the most important types of electron microscopes

1- **Transmission Electron Microscope** :-This type of microscope is used to study the internal structures of the cell, as the electrons in this case pass through the model, thus giving a clear picture of the structures. Examples of cellular components studied with this type of microscope are cell membranes.

2- : **Scanning Electron Microscope**:- It is used to study the external surfaces and topography of the cell, as the electrons in this case are not penetrated through the model, but are in contact with the external surfaces of the cells. The image formed in this type of microscope is

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three-dimensional

3- X-ray Microscope:

This microscope was designed on the same basis that relied on in the design of other electron microscopes, except that the source of electrons was replaced by a source of X-rays that have a very short wavelength, which can penetrate anything standing in front of them, which enables the researcher to obtain a clearer image than the images taken with all types of microscopes. other electronic

Any questions?

*Thank
You*