Pan American Society for Clinical Virology

presents

Effect of Viruses on Tissue Culture

CDC Slide Set

Provided by the
National Laboratory Training Network*

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Normal diploid cells at inoculation, 125X
The cells have formed a monolayer composed of numerous swirls of fibroblasts; each swirl contains elongated cells oriented in a common direction.
Normal diploid cells, 5 days later, 125X

Fibroblasts have formed a multilayer cell sheet. Each layer is oriented in a different direction. The few rounded, highly refractile cells represent fibroblasts in various stages of mitosis, and may or may not be viable.
Normal HEP-2 cells at inoculation, 125X
The monolayer consists of short, polygonal-shaped epithelial cells. Many rounded cells in mitosis are present.
Normal HEp-2 cells, 5 days later, 125X

An increased number of rounded cells and numerous areas of cellular overgrowth differentiate this monolayer from the earlier one.
Normal primary rhesus monkey kidney cells at inoculation, 125X

The monolayer consists of a mixed population of cells in which polygonal epithelial cells predominate.
Normal primary rhesus monkey kidney cells, 5 days later, 125X
The increased amount of cell rounding due to ageing and granularity differentiates this monolayer from the earlier one.
Normal SIRC (rabbit cornea) cells at inoculation, 125X
Epitheliod-shaped cells form a dense confluent monolayer. Few rounded cells are evident.
Normal SIRC (rabbit cornea) cells, 5 days later, 125X

Note that these cells are more granular than the earlier monolayer and more cell rounding is present.
Diploid cells infected with adenovirus 7 (early CPE), 125X

A discrete focal lesion consisting of large rounded cells is present against a normal cell background.
Diploid cells infected with adenovirus 7 (late CPE), 125X
A increased number of enlarged rounded cells are present.
HEp-2 cells infected with adenovirus 7 (early CPE), 125X

Many enlarged rounded cells are present in small clusters.
HEp-2 cells infected with adenovirus 7 (late CPE), 125X
An aggregation of enlarged rounded cells in irregular clusters is evident. Degenerated cells have fallen off the glass surface.
Primary rhesus monkey kidney cells infected with adenovirus 7 (early CPE), 125X
Aggregates of enlarged rounded cells are present in irregular clusters.
Primary rhesus monkey kidney cells infected with adenovirus 7 (late CPE), 125X
An increased number of enlarged rounded cells are aggregated into grape-like clusters. Degenerated cells have fallen off the glass surface.
Diploid cells infected with echovirus (early CPE), 125X

A few infected cells have become round and refractile.
Diploid cells infected with echovirus (late CPE), 125X

Many of the cells are rounded or stellate and refractile. Degenerated cells have fallen from the glass surface.
Primary rhesus monkey kidney cells infected with echovirus (early CPE), 125X

A general rounding of the cells is evident.
Primary rhesus monkey kidney cells infected with echovirus (late CPE), 125X

Note the generalized cell rounding. Many cells are involved in some stage of infection, and degenerated cells have fallen from the glass surface.
Diploid cells infected with herpes simplex virus (early CPE), 125X

A few rounded, swollen fibroblasts are present in a viral lesion.
Diploid cells infected with herpes simplex virus (late CPE), 125X
There is extensive cell rounding. Many degenerated cells have fallen off the glass surface.
HEp-2 cells infected with herpes simplex virus (early CPE), 125X
Many round swollen epithelial cells are present in several focal areas.
HEp-2 cells infected with herpes simplex virus (late CPE), 125X

Note the extensive piling of round swollen epithelial cells into clusters.
Primary rhesus monkey kidney cells infected with influenza virus, 125X

The monolayer appears to be normal.
Primary rhesus monkey kidney cells infected with influenza virus, plus guinea pig erythrocytes, 125X
Note the adsorption of erythrocytes to the infected cell monolayer.
Diploid cells infected with polio virus (Sabin) (early CPE), 125X

Large areas of cell rounding and cell degeneration are present.
Diploid cells infected with polio virus (Sabin) (late CPE), 125X
More extensive involvement of the cell monolayer differentiates this monolayer from the earlier one.
HEp-2 cells infected with polio virus (Sabin) (early CPE), 125X
The monolayer contains generalized cell rounding.
HEp-2 cells infected with polio virus (Sabin) (late CPE), 125X

The monolayer contains numerous areas of infected cells. Many cells have fallen from the glass surface. Note the rounded and refractile appearance of the cells which indicate dead or degenerating cells.
Primary rhesus monkey kidney cells infected with polio virus (Sabin) (early CPE), 125X

Generalized areas of rounded and clumped cells.
Primary rhesus monkey kidney cells infected with polio virus (Sabin) (late CPE), 125X

Extensive areas of cells are involved in infection. Many of the degenerated cells have fallen from the glass surface.
SIRC (rabbit cornea) cells infected with rubella virus (early CPE), 125X

Note the early formation of focal lesions consisting of swollen and rounded cells.
SIRC (rabbit cornea) cells infected with rubella virus (late CPE), 125X

Most of the monolayer consists of enlarged and rounded cells. Degenerated cells have fallen off the glass surface, leaving holes in the monolayer.
HEp-2 cells infected with rubeola virus (early CPE), 125X

Large multinucleated giant cells appear in several foci of infection.
HEp-2 cells infected with rubeola virus (late CPE), 125X

Large areas of syncytial formation and cell destruction are present.
Primary rhesus monkey kidney cells infected with rubeola virus (early CPE), 125X

A few multinucleated giant cells are present.
Primary rhesus monkey kidney cells infected with rubeola virus (late CPE), 125X

Almost all of the cell monolayer contains areas of syncytial formation and cell destruction.
Diploid cells infected with vaccinia virus (early CPE), 125X
The monolayer contains a focal area of degenerated cells and cytoplasmic bridges. Granular appearance is characteristic of vaccinia infected cells.
Diploid cells infected with vaccinia virus (late CPE), 125X
Almost all of the cells are infected. Large multinucleated giant cells connected with cytoplasmic fibrils are present.
HEp-2 cells infected with vaccinia virus (early CPE), 125X

A large lesion of rounded cells with granular appearance is present.
HEp-2 cells infected with vaccinia virus (late CPE), 125X

Clusters of multinucleated giant cells connected by long fibrils appear in the cell monolayer.
Primary rhesus monkey kidney cells infected with vaccinia virus (early CPE), 125X
Multinucleated giant cells with cytoplasmic bridges are present.
Primary rhesus monkey kidney cells infected with vaccinia virus (late CPE), 125X

Large multinucleated giant cells connected by long fibrils are present. Extensive cellular destruction is evident.
Diploid cells infected with varicella virus (early CPE), 125X
Many rounded cells are present in the large cytopathic lesion. The focus of infected cells is oriented with its long axis parallel to the cell alignment.
Diploid cells infected with varicella virus (late CPE), 125X.

Almost all of the cells are involved in infection. Extensive cell degeneration differentiates this late infection from the earlier one.
Diploid cells infected with cytomegalovirus virus (early CPE), 125X

Focal lesion of swollen, rounded, translucent cells.
Diploid cells infected with cytomegalovirus virus (late CPE), 125X

Progressed infection as indicated by the many foci of rounded, refractile cells.
Diploid cells infected with a rhinovirus (early CPE), 125X

Focal lesion consisting of round refractile cells and a few swollen cells.
Diploid cells infected with a rhinovirus (late CPE), 125X
Most of the cells are infected and many have lysed leaving a final granular debris.
HEp-2 cells infected with respiratory syncytial virus (early CPE), 125X

Discrete multinucleated giant cells.
HEp-2 cells infected with respiratory syncytial virus (late CPE), 125X

An increased number of giant cells and a large syncytium.
Normal chorioallantoic membrane (CAM)

Normal, delicate, translucent CAM. Note normal arrangement and appearance of blood vessels.
Uninfected CAM with non-specific lesions. These are non-specific lesions which may be confused with pocks caused by herpes simplex virus.
CAM infected with herpes simplex virus type 1 (isolated pocks, 3 days after inoculation).

Typical small white pocks.
CAM infected with HSV-1 (confluent lesions with isolated pocks around the edges)
CAM infected with herpes simplex virus type 2 (isolated pocks, 3 days after inoculation)

These pocks differ in size from those produced by HSV1 may be similar in many respects to those produced by variola virus.
CAM infected with HSV-2, confluent lesion, 3 days after inoculation
Hemorrhagic confluent lesion.
CAM infected with vaccinia virus (isolated pocks, 3 days after inoculation)
Large diffuse pocks with necrotic centers.
CAM infected with vaccinia virus (confluent lesions, 3 days after inoculation)

A hemorrhagic confluent lesion.
CAM infected with variola virus (isolated lesions, 3 days after inoculation)

Variola pocks are slight larger than herpes simplex virus type 1 pocks and have a circular dome shape.
CAM infected with variola virus (confluent lesions, 3 days after inoculation)

Confluent lesion with some isolated pocks around the edges.