REGULATION OF PERSISTENT INFECTIONS WITH HUMAN CORONAVIRUS OC43

Arlene R. Collins

Department of Microbiology, School of Medicine, State
University of New York at Buffalo, Buffalo, New York 14214

Cells cultured from human tumors of neural origin offer an easily accessible avenue to the study of the neurotropism of OC43 virus in human cells. Using a tissue culture adapted strain of OC43 virus a comparative study of the replication and persistence of OC43 virus in two cell lines was undertaken. U87-MG cells of glioblastoma origin which were relatively insusceptible to infection (yield at 24 hrs = 1 pfu per cell) and RD cells of rhabdomyosarcoma origin which were susceptible to infection (yield at 24 hrs = 30 pfu per cell) were studied. The purpose of this study was to establish persistent infections in these cells, observe how virus replication is regulated and to cure the cells of the infection.

It was observed that persistent infection with human coronavirus OC42 can be readily established within 28 days at 37°C in human rhabdomyosarcoma (RD) and human glioblastoma (U87-MG) cell lines. An average titer of 2×10^8 plaque forming units (PFU) per ml of infectious virus and 1-16 HA units of hemagglutinin are produced by persistently infected (PI) cultures¹. Temperature sensitive plaque variants are recovered from PI cultures at 31°C on RD or HRT-18 (human rectal tumor) cell monolayers. Increased antigen synthesis and cell death occurs in PI cultures when the temperature is lowered to 31°C. Infectious virus was no longer recovered from PI cultures after treatment with antiserum to whole virus for 30 days or incubation at 39.5°C for 45 days. Probing the cured cells with OC43-specific ³²P-cDNA showed that cured cells contained no detectable viral RNA. Immunoblot analysis of the antiserum to whole virus used to cure PI cultures showed binding to a polypeptide of 190,000 molecular weight, which is the E2 peplomer glycoprotein and to a polypeptide of

130,000 molecular weight which may function as the hemagglutinin as described for bovine coronavirus².

REFERENCES

1. Collins, A.R. and Sorenson, O. Regulation of viral persistence in human glioblastoma and rhabdomyosarcoma cells infected with coronavirus OC43. *Microbial Pathogenesis* (1986). (in press).
2. Hogue, B.G. et al. Antigenic relationships among proteins of bovine coronavirus, human respiratory coronavirus OC43 and mouse hepatitis coronavirus A59. *J. Virol.* 51: 384-388 (1984).