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Resistance of DNA and RNA viruses to UV radiation

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The inactivation of different kind of pathogens by UV radiation is known for long time and widely used. Due to wide variety of viruses (by structure, size, envelope) their sensitivity to UV radiation is quite different and not quite predictable. DNA viruses (adenovirus, type 5, Herpes simplex virus (HSV), type 1) and RNA viruses (human immunodeficiency virus (HIV), type 1, poliovirus, type 1, Sabin strain) were obtained from State collection of viruses (the D.I. Ivanovsky Institute of Virology). The source of UV radiation was a 15 watt low pressure mercury vapor lamp (254 nm over 60%). The samples were placed 0.3 m direct under the UV lamp flow. The dose of inactivation D (J/m^2) 90.0% - 99.99% was estimated. It was shown that poliovirus and Herpes simplex virus were not very resistant to UV radiation ($D_{99.99} = 128.7 J/m^2$ for poliovirus and $193.0 J/m^2$ for HSV). Adenovirus was much more resistant and kinetics of inactivation was different ($D_{99.99} = 772.0 J/m^2$). HIV was most resistant to UV radiation among the studied viruses. It takes more than 4hrs to inactivate virus onto surface ($D_{99.9} > 1500 J/m^2$). The results of the study indicate that there is no direct connection between sensitivity to UV light and the size of the virion or presence\absence of the envelope. The diverse resistance of the different viruses to UV radiation should be taken into account, when UV light is used to inactivate infectious viruses in hospitals and other public environments.

Biography

Nickolai Nossik graduated from Moscow Medical University as a Physician. He did his PhD in 1960 and Doctor of Science in 1988. From 1968-1973, he was the WHO expert in SEARO (India) on national and international projects on Virology and Epidemiology. In 1975, he was as a Visiting Scientist and was doing the research study on oncomaviruses at the National Institute of Oncology (Fort Detrick). His main scientific interests are - interferons, immunomodulators, antiviral and virucidal preparations. He is the Head of Laboratory of Virus Ontogenesis Ivanovsky Institute of Virology, N.F. Gamaleya FRCEM», Moscow, Russia. He has published 2 monographies, 6 books chapters and more than 200 papers in scientific journals.

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