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The role of virus receptor expression on viral pathogenesis

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Dr. Robert Finberg is Professor of Medicine and Microbiology and Physiologic Systems, and Chair of the Department of Medicine, at the University of Massachusetts Medical School. Dr. Finberg received his A.B. from the University of Chicago and his M.D. from Albert Einstein. He trained in Internal Medicine at Bellevue Hospital/NYU, and did fellowships in Pathology and Infectious Diseases at Harvard Medical School. His work has yielded notable advances, including characterizing a major cellular receptor for viruses, the coxsackie and adenovirus receptor, and its role in picornavirus infection and gene delivery for adenovirus vectors as well as in cardiac development. His research on innate immunity defined the importance of "pattern recognition proteins," including toll-like receptors, CD14 and helicases, in the virus-host interaction. He leads a multicenter study on the evolution of influenza viruses. He has written more than 240 peer-reviewed journal articles and 65 book chapters.

Virus receptors play an important role in the pathogenesis of infectious disease by defining tissue tropism as well as providing the initial signals for the host response. Cell surface receptors for viruses include both membrane-spanning proteins as well polysaccharides. Recent technologies including CRISPR screens have allowed the definition of receptor proteins (including the disintegrin and metalloproteinase protein- ADAM9 as a receptor for encephalomyocarditis virus-EMCV) and single cell sequencing techniques have allowed for a better definition of virus tropism and host response. The role of ADAM9 in EMCV pathogenesis and the tropism and pathogenesis of influenza as it relates to receptor binding will be discussed.