

Project Leader **Satoshi Koike** Neurovirology Project

## Protect the Central Nervous System from infectious Diseases

“The development of vaccine and anti-viral drugs and that of experimental models for the evaluation of these agents are important for controlling emerging and re-emerging viral infections. We will study the basic principles of neurotropic enterovirus infection and provide knowledge and technologies to control infectious diseases.”

Kobayashi K, et al. (2018) “Amino Acid Variation at VP1-145 of Enterovirus 71 Determines Attachment Receptor Usage and Neurovirulence in Human Scavenger Receptor B2 Transgenic Mice.” *J. Virol.*, 92:(15) e00681-18

Fujii K, et al. (2018) “VP1 Amino Acid Residue 145 of Enterovirus 71 Is a Key Residue for Its Receptor Attachment and Resistance to Neutralizing Antibody during Cynomolgus Monkey Infection.” *J. Virol.*, 92:(15)e00682-18

Fujii K, et al. (2013) “Transgenic mouse model for the study of enterovirus 71 neuropathogenesis.” *Proc. Natl. Acad. Sci. USA.*, 110: 14753-14758

Yamayoshi S, et al. (2013) “Functional Comparison of SCARB2 and PSGL1 as Receptors for Enterovirus 71.” *J. Virol.*, 87:3335-3347

Yamayoshi S, et al. (2012) “Human SCARB2-dependent Infection by Coxsackievirus A7, A14, A16 and Enterovirus 71.” *J. Virol.*, 86:5686-5696

Abe Y, et al. (2012) “The Toll-like receptor 3-mediated antiviral response is important for protection against poliovirus infection in poliovirus receptor transgenic mice.” *J. Virol.*, 86:185-194

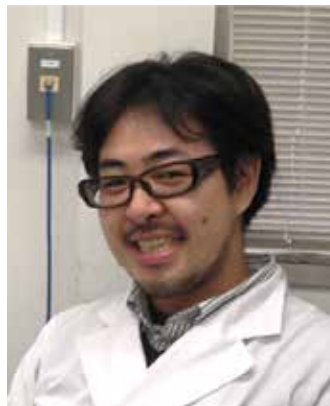
Yamayoshi S, Koike S. (2011) “Identification of the Human SCARB2 Region That Is Important for Enterovirus 71 Binding and Infection.” *J. Virol.*, 85: (10) 4937-4936

Yamayoshi S, et al. (2009) “Scavenger receptor B2 is a cellular receptor for enterovirus 71.” *Nature Medicine* 15:789-801

Enterovirus 71 (EV71) is a human enterovirus species A of the genus *Enterovirus* within the *Picornaviridae* family, and it is known to be one of the causative agents of hand-foot-and-mouth disease (HFMD). HFMD is considered to be a mild and self-limiting disease in general. However, in some infants and young children, HFMD caused predominantly by EV71 can be complicated by neurological manifestations. Thus, EV71 infection is a serious public health concern. Unfortunately, there is still very little information concerning EV71 pathogenesis, and vaccines or anti-EV71 drugs have yet to be developed.

### Members

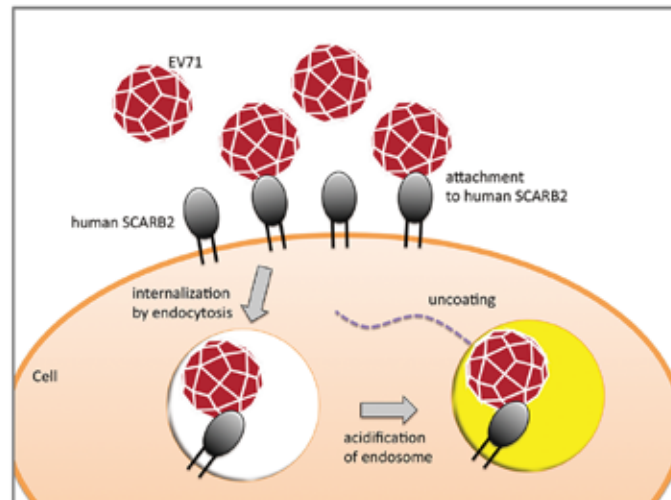
Kyosuke Kobayashi



## Research Topics

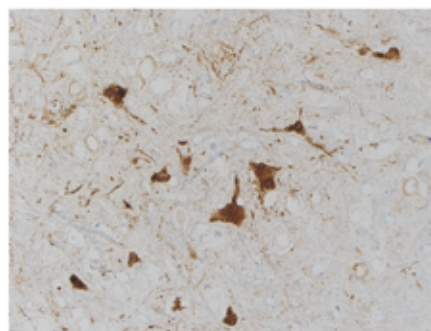
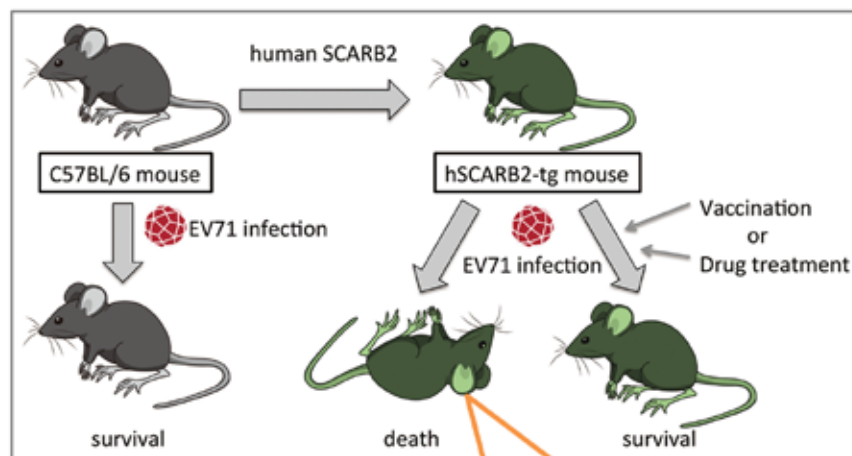
### Mechanism of Enterovirus 71 infection

We recently found that Scavenger receptor B2 (SCARB2) is a receptor for EV71. SCARB2 plays a central role in early stages of EV71 infection. SCARB2 is able to mediate binding of the virus at the cell surface, internalization of the virus and initiation of uncoating.



### Development of an animal model for Enterovirus 71 infection

The transgenic mouse expressing human SCARB2 is susceptible to EV71. It is a useful model for the study of EV71 pathogenesis and vaccine efficacy test.



EV71 antigens in the spinal cord of SCARB2 tg mice