



# Animal model studies on viral infections

Akio Adachi<sup>1\*</sup> and Tomoyuki Miura<sup>2</sup>

<sup>1</sup> Department of Microbiology, Institute of Health Biosciences, The University of Tokushima Graduate School, Tokushima, Japan

<sup>2</sup> Laboratory of Primate Model, Experimental Research Center for Infectious Diseases, Institute for Virus Research, Kyoto University, Kyoto, Japan

\*Correspondence: adachi@basic.med.tokushima-u.ac.jp

## Edited by:

Akihide Ryo, Yokohama City University, Japan

## Reviewed by:

Yasuo Ariumi, Kumamoto University, Japan

Ayumi Kudoh, Yokohama City University School of Medicine, Japan

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One of the major missions of animal virology is to understand how viruses replicate and cause asymptomatic/symptomatic conditions in individuals (Nomaguchi and Adachi, 2010). It is especially important for virologists who work on viruses pathogenic for humans to elucidate bases underlying the *in vivo* viral characteristics. Toward this end, animal model studies in some ways are necessary to precisely analyze the *in vivo* situation, and also are essential for developing countermeasures against virus infections. Since a full variety of viruses with distinct biological properties exist, we virologists should study “the target virus” in a specialized manner, in addition to common theoretical/experimental approaches. The Research Topic entitled “Animal model studies on viral infections” collects articles that describe the studies on numerous virus species for their animal models, or those at various stages toward animal experiments.

Articles in this Research Topic were written by experts in various research fields, and can be fairly grouped into a few categories: (i) descriptions/evaluations/new challenges of animal model studies for investigating the biology of viruses; (ii) experimental materials/methods for upcoming animal model studies; (iii) observations important for animal model studies. (i) Reynaud and Horvat (2013) have described the animal models for human herpesvirus 6 to better understand its pathogenic property. Studies on filoviruses, classified as biosafety level-4 and represent a serious world-wide problem today, have been reviewed by Nakayama and Saijo (2013). Mailly et al. (2013) have focused on the quest for appropriate animal models for hepatitis C virus. Clark et al. (2013) have discussed about the use of non-human primates as models for dengue hemorrhagic fever/dengue shock syndrome. Ohsugi (2013) has summarized mouse strains transgenic for the *tax* gene of human T-cell leukemia virus type 1 (HTLV-1). Also, a bovine model for HTLV-1 pathogenesis has been described by Aida et al. (2013). Challenging new attempts to establish human immunodeficiency virus type 1 (HIV-1)/macaque infection models have been reviewed by Misra et al. (2013), and also by Saito and Akari (2013). Another approach to understand HIV-1 biology *in vivo* has been described by Matsuyama-Murata et al. (2013). (ii) Kodama et al. (2013) has described a new and simple method to prepare human dendritic cells from peripheral blood mononuclear cells. Doi et al. (2013) have summarized their studies on macaque-tropic HIV-1 clones.

Ikeno et al. (2013) has reported a new, sensitive, and quantitative system to monitor measles virus infection in humanized mice. Iwami et al. (2013) have summarized the quantification of viral infection dynamics based on various quantitative analyses. (iii) Tada et al. (2013) have suggested that LEDGF/p75 may be a cellular factor acting as a species-barrier against HIV-1 in mouse cells. Kuwata et al. (2013) have shown that simian immunodeficiency virus may acquire the increased infectivity and resistance to neutralizing antibodies by truncation of its gp41 cytoplasmic tail. Ohsugi et al. (2013) have reported that natural infection status of laboratory mice by murine norovirus. Finally, Kajitani et al. (2013) have described the possible involvement of E1<sup>E4</sup> protein of human papillomavirus type 18 in its differentiation-dependent life cycle.

We are proud to add our “Animal model studies on viral infections” to a series of Research Topic in Frontiers in Microbiology. A wide variety of DNA and RNA viruses are covered by this special issue consisting of original research, review, mini-review, methods, and opinion articles. As we described in the beginning, animal studies are certainly required for understanding virus replicative/pathogenic properties *in vivo* and for overcoming virally-caused infectious diseases. We human virologists should make every effort to fight against numbers of unique pathogenic viruses.

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