Molecular Virology

1. Staffs and Students (April 2009)

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2. Purpose of Education

Microbiology covers several aspects of bacteriology, immunology and virology. Through the studies on various microbes it is expected to understand host-parasite relationship and mechanisms of pathogenicity. Unlike the past, microbiology has rapidly been drawn to the center of the biological stage.

Our laboratory mainly deals with viral oncogenesis and immunodeficiency of the man. Especially, several projects are carried out with the emphasis on investigations into the mechanisms of viral replication and pathogenesis induced by human retroviruses (HIV-1 and HTLV-I) and human herpes viruses. The purpose of many of the studies being undertaken is to identify critical events and molecules responsible for the efficient replication of these viruses, and in case of human retroviruses, those for resulting transformation or destruction of normal lymphocytes. Virological, immunological and molecular approaches are being applied for this purpose.

3. Research Subjects

Following studies have been extensively carried out in out laboratory with various biological and molecular biological techniques:

- Pathogenesis of HIV and HTLV (mutation, virulence, apoptosis, polymorphism).
- Studies on signal transduction pathways targeted by viral proteins.
- Molecular cloning by genetic complementation of components essential for virus replication in mammalian cells.

4. Publications: Original articles

1. Miyakawa K, Ryo A, Murakami T, Ohba K, Yamaoka S, Fukuda M, Guatelli J, Yamamoto N.: BCA2/Rabring7 promotes tetherin-dependent HIV-1 restriction. PLoS Pathog. Dec;5(12):e1000700. 2009
2. Suzuki S, Zhou Y, Refaat A, Takasaki I, Koizumi K, Yamaoka S, Tabuchi Y, Saiki I, Sakurai H.: HTLV-1 manipulates interferon regulatory signals by controlling TAK1-IRF3 and IRF4. J Biol Chem. Dec 2. 2009
3. Tokunaga F, Sakata S, Saeki Y, Satomi Y, Kirisako T, Kamei K, Nakagawa T, Kato M, Murata S, Yamaoka S, Yamamoto M, Akira S, Takao T, Tanaka K, Iwai K.: Involvement of linear polyubiquitylation of NEMO in NF-kappaB activation. Nat Cell Biol. 11(2):123-32. 2009
4. Nonaka M, Uota S, Saitoh Y, Takahashi M, Sugimoto H, Amet T, Arai A, Miura O, Yamamoto N, Yamaoka S.: Role for protein geranylgeranylation in adult T-cell leukemia cell survival. Exp Cell Res. Jan 15;315(2):141-50. 2009
5. Sakuma R, Sakuma T, Ohmine S, Silverman RH, Ikeda Y.: Xenotropic murine leukemia virus-related virus is susceptible to AZT. Virology. Dec 1. 2009
6. Sakuma R, Ohmine S, Ikeda Y.: Determinants for the rhesus monkey TRIM5{alpha}-mediated block of the late phase of HIV-1 replication. J Biol Chem. Dec 1. 2009