Rapid diagnosis of viral infectious diseases

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Sexually transmitted infections (STIs) have been recognized as a major public health problem throughout the world. The results of infection include acute and chronic symptoms and serious delayed consequences such as infertility, ectopic pregnancy, cervical cancer, and the untimely deaths of infants and adults. Prevention and control of STIs should be an integral part of comprehensive sexual and reproductive health services in order to contribute towards the attainment of them Millennium Development Goals. Globally, viral STIs, including human immunodeficiency virus (HIV), human herpesvirus (HSV), human papillomavirus (HPV), hepatitis B virus (HBV), and hepatitis C virus (HCV), have been growing concerns, especially for developing countries, because they are more intractable than bacterial and fungal infections, and constitute a huge health and economic burden.

Human papillomavirus causes about 500,000 cases of cervical cancer annually with 240,000 deaths, mainly in resource-poor countries. Statistical analysis has shown an increased prevalence of genital cancers in Latin America and Asia, and in this context, countries including Brazil, Mexico, Colombia, Venezuela, and others, are still reporting a high incidence of genital cancer each year. More than 200 papillomavirus types have been characterized by their DNA sequence, of which more than 100 can be found infecting humans and about 40 can infect the genital tract, which fall into two categories: high and low risk. The high-risk types are associated with the development of cervical cancer and anogenital cancer, while HPV infections at low risk are related to benign genital warts. Therefore, there is a great need to study and to understand the biology of these viruses, and to detect them as soon as possible in the patients.

It has been estimated that 38.6 million people are infected by HIV worldwide. Not only adults, but also children are affected; the World Health Organization (WHO) estimates that two million children less than 15 years are infected by HIV-1. Although the majority of infected children live in Sub-Saharan Africa, more than 10,000 among the estimated 730,000 people infected by HIV-1 in Brazil are probably children. Although the survival of HIV

infected patients has markedly improved since the introduction of highly active antiretroviral treatment (HAART), recent studies have revealed that it is critical to reduce viral load by chemotherapy as soon as HIV infection is proven. In order to achieve the maximal effect of HIV treatment, we have to avoid the generation of drug-resistant HIVs by monitoring HIV genotypes.

To characterize HPV subtype in patients and the monitoring of HIV genotypes in patients, we have developed a new method for a rapid diagnosis of viral infection using a new generation sequencer.

Profile of Professor Koyasu

1978	B.S. University of Tokyo, Tokyo, Japan
1980	M.S. University of Tokyo
1983	Ph.D. University of Tokyo (Biochemistry)
1981-1988	Researcher, Department of Cell Biology, Tokyo Metropolitan Institute of Medical Science
1988	Research Fellow, Laboratory of Immunobiology, Dana-Farber Cancer Institute, Boston, MA
1988-1990	Instructor in Pathology, Harvard Medical School
1990-1995	Assistant Professor of Pathology, Harvard Medical School
1995-1996	Associate Professor of Medicine, Harvard Medical School
1995-	Professor and Chairman, Department of Microbiology and Immunology, Keio University School of Medicine
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