GCOE ZOONOSIS CONTROL Hokkaido University

4th Global COE Seminar

Date & time April 23 (fri), 2010, 17:00-18:00

Venue Conference Hall
Graduate School of Veterinary Medicine
Address/ Kita 18-jyo Nishi 9-chome, Kita-ku, Sapporo

開催日時 2010 年 4 月 23 日（金）17:00 ～ 18：00

開催場所 北大獣医学研究科 講義棟 講堂
札幌市北区北 18 条西 9 丁目

■主催　北海道大学グローバル COE プログラム
『人獣共通感染症国際共同教育研究拠点の創成』
http://www.vetmed.hokudai.ac.jp/gcoe/

■問い合わせ先　北大獣医学研究科グローバル COE 推進室
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ACADEMIC DEGREES:

M.D.	1987	Justus-Liebig-University, Giessen, Germany
Ph.D.	1988	Philipps-University, Marburg, Germany
H.D.R.	1997	Philipps-University, Marburg, Germany

PROFESSIONAL APPOINTMENTS:

1988 - 1992	Postdoctoral Fellow, Philipps-University, Marburg, Germany
1992 - 1994	Postdoctoral Fellow, Centers for Disease Control & Prevention, Atlanta, USA
1994 - 1998	Assistant Professor, Philipps-University, Marburg, Germany
1998 - 1999	Associate Professor, Philipps-University, Marburg, Germany
1999 - 2008	Chief, Special Pathogens Program, Public Health Agency of Canada, Winnipeg, Canada
2008 – present	Chief, Laboratory of Virology, Division of Intramural Research, NIAID, NIH, Hamilton, USA

RESEARCH INTERESTS:

Biology, ecology and pathogenesis of emerging and re-emerging, highly pathogenic viruses with main focus on those causing viral hemorrhagic fever (e.g., filoviruses, arenaviruses and bunyaviruses) with the goal to develop diagnostics, therapeutics and vaccines.

Program operation and of high containment laboratories (BSL3 and BSL4).

Pre- and Post-Exposure Vaccination for Viral Hemorrhagic Fevers

Heinz Feldmann
Chief, Laboratory of Virology,
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National Institute of Allergy and Infectious Diseases, National Institutes of Health

Viral hemorrhagic fevers (VHFs) have gained increasing interest worldwide as public health problems and agents of potential misuse (bioterrorism). Therefore many nations have scaled up their efforts to develop countermeasures against VHFs such as rapid diagnostics, antivirals, and vaccines. Early efforts in vaccine development have concentrated on the use of 'killed virus' and live-attenuated vaccines. Over the past decade studies focused on subunit vaccines built upon viral structural proteins delivered by different approaches including DNA vaccination or replication-deficient viruses. Many of these approaches resulted in protective efficacy in rodent models but largely failed to protect nonhuman primates, the gold standard model for several VHFs.

Given the partial success in generating effective vaccines in the past, we decided to investigate the utility of a replication-competent vector, such as recombinant vesicular stomatitis virus (rVSV). We developed rVSVs in which the VSV glycoprotein is completely replaced by a foreign transmembrane glycoprotein. The rVSVs were first safety tested in different immune-competent (rodents, goats, macaques) and immune-compromised (mice, macaques) species and neither clinical symptoms nor abnormalities in blood chemistry and hematology have been observed in any of the animals. Next, the rVSVs were studied in respect to their potential in mounting protective immune responses against lethal virus challenge. For Ebola and Marburg complete and sterile immunity was achieved in rodent and macaque models, whereas for Lassa complete but not sterile immunity was demonstrated. Back-challenge experiments demonstrated cross-protection within but not among species. Mucosal immunity could be achieved with a single dose scheme in mice, guinea pigs and nonhuman primates. Effective post-exposure treatment was demonstrated in the nonhuman primates for Ebola and Marburg virus.

Our data suggest that the rVSVs are not only highly potent and safe, but induce rapid and often 'sterile' immunity. The potential for mucosal delivery make them potent candidates for mass immunization and also useful for application in wildlife. The approach might also be a promising concept for future vaccine development against other pathogenic VHF agents.

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