Hearing of the House Committee on Oversight and Government Reform Subcommittee on Transportation and Public Assets

The Role of the National Institute of Allergy and Infectious Diseases in Research Addressing Zika Virus

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NIAID Research: A Dual Mandate

Maintain and “grow” a robust basic and applied research portfolio in microbiology, infectious diseases, immunology and immune-mediated diseases

Respond rapidly to new and emerging disease threats

New/Improved Interventions

Zika Virus in the Americas — Yet Another Arbovirus Threat

AS Fauci and DM Morens

Biomedical Research Response: Epidemiology and Natural History

- Epidemiology and natural history
  - Symptomatic vs. asymptomatic
  - Frequency of sequelae
  - Cohort studies to determine incidence of adverse pregnancy outcomes in Zika-infected pregnant women

- Pathogenesis of microcephaly

Biomedical Research Response: Basic Science

- Molecular Virology: a) elucidate viral structure; b) compare viruses from different outbreaks

- Pathogenesis of disease

- Studies on immune response (innate and adaptive)

- Establish animal models
**Biomedical Research Response: Diagnostics**

- CDC – Diagnostic and Reference Laboratory in Arbovirus Disease Branch
- RT-PCR assay for Zika, Dengue and Chikungunya
- Antibody assay for acute infection that will not cross-react with other flaviviruses

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**Biomedical Research Response: Countermeasures – Vaccines**

- DNA vaccine – success with West Nile Virus (NIAID)
- Live-attenuated dengue/Zika chimeric vaccine (for non-obstetric population) – success with dengue alone (NIAID)
- Whole particle inactivated vaccine (NIAID/BARDA)
- Vesicular stomatitis virus (VSV) vectored vaccine (Harvard)

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**DNA Vaccine Approach**

Gene encoding surface protein from Zika virus

Inject DNA containing Zika gene

Body’s cells produce virus-like particles, the basis of the vaccine

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**Biomedical Research Response: Countermeasures – Therapeutics**

- Developed *in vitro* antiviral screening assay
- Testing compounds with known activity against other flaviviruses
- Broad screening of compounds without known anti-flavivirus activity
- “Targeted” antiviral approach – similar to HIV and Hepatitis C

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**Emerging Infections: A Perpetual Challenge**

DM Morens, GK Folkers & AS Fauci