Rapid, Reagentless Viral Diagnostic

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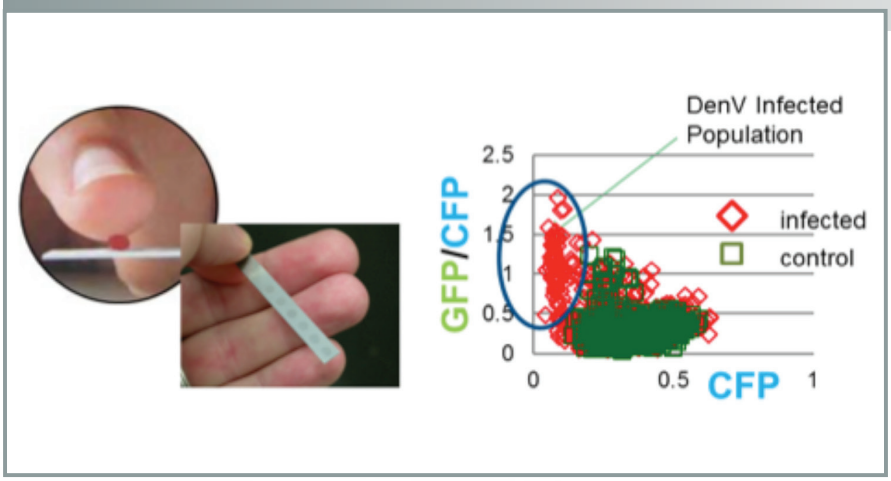

Technology Summary

A functional viral diagnostic assay has been developed whereby DNA-launched viral replicons are delivered into suspect infected cells and tissue, such as isolated monocytes. Within infected cells, viral replication is quantitatively indicated via a fluorescent response which provides indication of the infectiousness of the virus within the patient. The method exploits a unique gene delivery strategy that can be conducted in resource-constrained environments and which achieves extremely rapid transgene expression of the DNA-launched, virally replicated measurement signal The method is applicable to a large array of RNA viral pathogens which includes but is not limited to Dengue, Hepatitis C, Ebola, Marburg, West Nile, Chikungunya, Foot and Mouth Disease, and Porcine Reproductive and Respiratory Syndrome Virus .

Advantages

- Highly fieldable: The system uses components that do not require substantial clinical infrastructure and which may be stored dry until ready for use. Cold chain is not required
- Applicable to acute infection: Experiments indicate activity of viral replication within Dengue infected cells can be indicated within 6-hrs of initial viral challenge
- Highly specific: Response to a virus is derived from the specificity of the DNA-launched reporter construct. Method can resolve viral serotype by use of multiple DNA-launched replicons
- Indicative of infectiousness: As a functional assay of viral replication, the method indicates infectiousness of the virus within the subject, providing improved response to outbreak

Potential Applications

- Diagnosis of acute viral infection in both clinical settings and resource-constrained environments
- Viral screening
- Blood screening
- Penside diagnosis of animal viral infections
- Insect vector surveillance

Patents

Timothy E. McKnight, *Rapid and Highly Fieldable Viral Diagnostics,* Non-provisional US Patent 14/212,718, filed March 14, 2014.

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Michael A. Guillorn, Douglas Lowndes, Vladimir I. Merkulov, Michael L. Simpson, and Anatoli V. Melechko, *Controlled Alignment Catalytically Grown Nanostructures,* US Patent 7,408,186, issued August 5, 2008.

Michael A. Guillorn, Douglas Lowndes, Vladimir I. Merkulov, Michael L. Simpson, and Anatoli V. Melechko, *Apparatus for Controlled Alignment of Catalytically Crown Nanostructures,* US Patent 7,245,068, issued July 17, 2007.

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Michael A. Guillorn, Douglas Lowndes, Vladimir I. Merkulov and Michael L. Simpson, *Carbon Tips with Expanded Bases Grown with Simultaneous Application of Carbon Source and Etchant Gases,* US Patent 6,649,431, issued November 18, 2003.

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