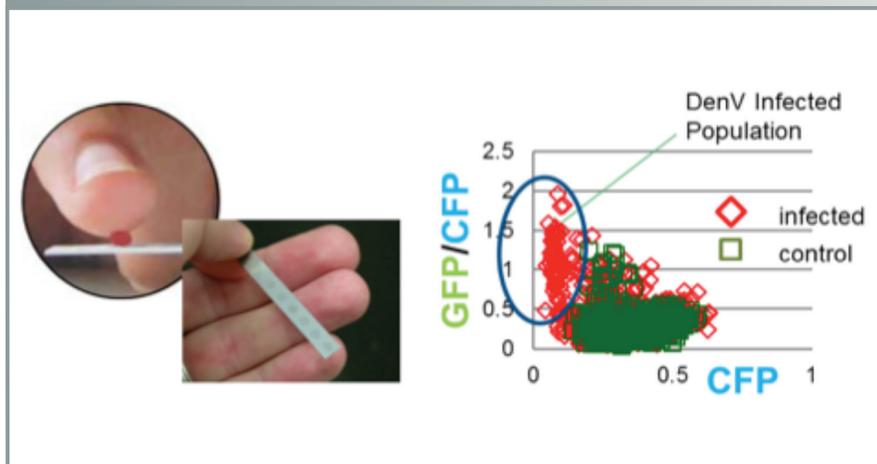


# Rapid, Reagentless Viral Diagnostic

UT-B IDs 201202943, 200101021, 200100903



## Technology Summary

A 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 activity is quantitatively indicated via a fluorescent response. 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 determined 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 is anticipated to 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
- Pensive 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.

Michael A. Guillorn, Douglas Lowndes, Vladimir I. Merkulov, Michael L. Simpson, and Anatoli V. Melechko, *Controlled Alignment of Catalytically Grown Nanostructures in a Large-scale Synthesis Process*, US Patent 7,947,976, issued May 24, 2011.

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 Grown Nanostructures*, US Patent 7,245,068, issued July 17, 2007.

Michael A. Guillorn, Douglas Lowndes, Vladimir I. Merkulov and Michael L. Simpson, *Carbon Containing Tips with Cylindrically Symmetrical Carbon Containing Expanded Bases*, US Patent 7,109,515, issued September 19, 2006.

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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