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**Nanotechnology enabled targeted therapy for seasonal and pandemic influenza; opening a new window to anti-viral therapy**

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The emergence of the pandemic 2009 H1N1 influenza virus became a world-wide health concern. As drug resistance appears, a new generation of therapeutic strategies will be required. Here, we introduce a nanotechnology approach for the therapy of pandemic and seasonal influenza virus infections. This approach uses gold nanorods (GNRs) to deliver an innate immune activator, producing a localized therapeutic response. We demonstrate the utility of a biocompatible gold nanorod, GNR-5'PPP-ssRNA nanoplex, as an antiviral strategy against type A influenza virus. In human respiratory bronchial epithelial cells, this nanoplex activated the retinoic acid-inducible gene I (RIG-I) pathogen recognition pathway, resulting in increased expression of IFN- $\beta$  and other IFN-stimulated genes (ISGs) (e.g., *PKR*, *MDA5*, *IRF1*, *IRF7*, and *MX1*). This increase in type I IFN and ISGs resulted in a decrease in the replication of both seasonal and pandemic H1N1 influenza viral strains.

## Biography

Krishnan Chakravarthy, MD, Ph.D., is founding President and CEO of NanoAxis. He holds a BA degree in Biology from the University of Chicago. He completed his MD, Ph.D. Program at State University of New York at Buffalo School of Medicine. He has also served as a contractor at the U. S. Centers for Disease Control and Prevention (CDC). He has published several major papers in the field of nanomedicine, presented at both national and international conferences, and authored numerous patents in the field. He intends to guide NanoAxis to becoming a global leader in nanomedicine technologies.

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