

April 29 , 2009: AusSMC Briefing: A step closer to a universal flu vaccine

**Dr Mohammed Alsharifi**

**Infectious Diseases Laboratories/ Institute of Medical and Veterinary Science, SA**

## Bio Note

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Mohammed Alsharifi grew up in Babylon/Iraq and studied Veterinary Medicine at Baghdad University. After coming to Australia, he studied Biomedical Science at Monash University to graduate with First Class Honours. In 2001, he was awarded Australian National University PhD scholarship for studies at the John Curtin School of Medical Research with Prof Arno Müllbacher, Dr Mario Lobigs, and Prof Robert Blanden to study Immune Responses to Viral Infections. Following the completion of his PhD studies, Dr Alsharifi was encouraged by Prof. Müllbacher to stay at JCSMR to investigate the use of gamma-irradiated influenza preparations as a vaccine candidate to induce cross-reactive and cross-protective immunity. In 2008, Dr Alsharifi accepted a Royal Adelaide Hospital/ IMVS Early Career Fellowship and moved to Infectious Diseases Laboratories/ SA Pathology to continue his investigations.

## Abstract

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Influenza A virus causes significant morbidity and mortality worldwide. Influenza virus mutates quickly, and current flu vaccines require annual updating to protect against the rapidly arising antigenic variants of the virus. However, by the time a vaccine is created the virus may have already changed resulting in reduced vaccine efficacy such as that observed for 2007-2008 flu season in the northern hemisphere. Therefore, vaccine manufacturing based on current methods cannot ensure protection against pandemic influenza.

Current subunit or split flu vaccines rely exclusively on antibody responses for protection and do not induce cytotoxic T cell responses, which are broadly cross-reactive between virus strains. Prof Müllbacher has previously reported that gamma-ray inactivated flu virus can induce cross-reactive T cell responses. Our current research shows that intranasal administration of purified gamma-ray inactivated human influenza A virus preparations (gamma-Flu) effectively induces heterotypic and cross-protective immunity. A single intranasal administration of gamma-A/PR8[H1N1] protects mice against lethal H5N1 and other heterotypic infections. Therefore, intranasal gamma-Flu represents a unique approach for a cross-protective vaccine against both seasonal as well as possible future pandemic influenza A virus infections.

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Contact: Australian Science Media Centre  
PO Box 237  
RUNDLE MALL SA 5000  
Ph: 08 8207 7415 | Fax: 08 8207 7413 | Email: [info@aus-smc.org](mailto:info@aus-smc.org) | Web: [www.aus-smc.org](http://www.aus-smc.org)

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