

A Company Developing a Universal Flu Vaccine

Overview

Head-quartered in Canberra (Australia) Gamma Vaccines Pty Limited was incorporated in July 2009 to develop a universal cross-protective influenza virus vaccine.

Its lead product Gamma-Flu™ stimulates broad-spectrum immunity to all influenza virus A strains tested, including H1N1, H5N1 (Bird Flu) and H3N2 strains. Gamma-Flu holds the prospect of being able to be stockpiled as an immediate emergency response vaccine to the emergence of new pandemic influenza A virus strain.

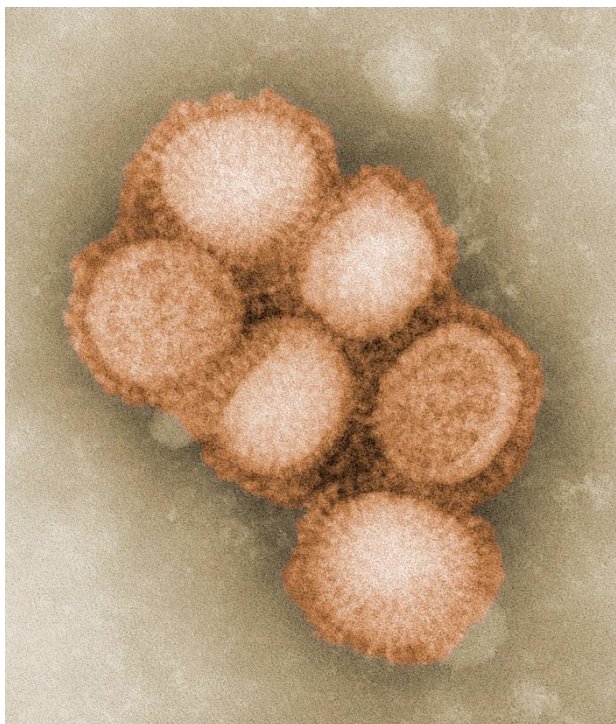
The Challenge

“One of the great challenges in vaccinating individuals against influenza is that new strains can suddenly emerge, rendering currently available vaccines ineffective,” said Gamma Vaccines’ founding scientist Professor Arno Müllbacher, Head of the Viral Immunology Group at The Australian National University.

The Need

The emergence of a highly virulent influenza virus that causes a horrifying level of mortality has been predicted for some time. Indeed, modelling of the consequences of a 1968 Hong Kong-type flu recurring today has predicted 62 million deaths worldwide, with a majority of those deaths being in developing countries.

The Target



Influenza A (Source: Centers for Disease Control)

The Solution

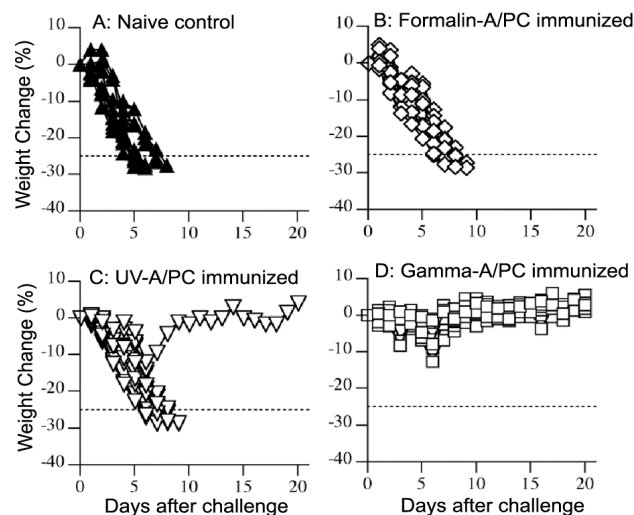
The key to providing broad-spectrum immunity to different influenza virus strains requires vaccines that can trigger protective cytotoxic T-cell responses to destroy virus-infected cells. Gamma Vaccines manufactures and kills influenza virus in a manner that preserves the proper structure of the virus and its various proteins. By using gamma irradiation – a procedure in wide-spread use to sterilize surgical instruments and stop spoilage of perishable fruits – a killed virus preparation can be obtained that is no longer infectious, which can be delivered by different routes of administration, and which induces a potent immunity to different influenza virus strains and subtypes.

The History

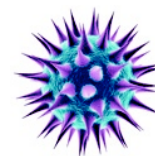
The generation of whole-inactivated influenza viruses has a long history. However, preparing them in a form that preserves their integrity, with an emphasis on achieving cytotoxic T-cell responses rather than antibody responses has not been a priority in the influenza vaccine industry.

The Evidence

Gamma-irradiated Influenza virus A/PC - an H3N2 strain, affords 100% protection against heterotypic challenge with influenza virus A/PR8 - an H1N1 strain. By contrast, formalin- or UV-inactivated A/PC fails to protect against heterotypic challenge.

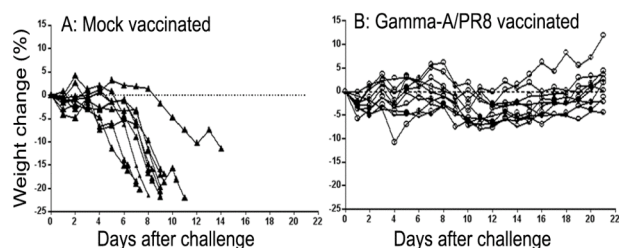


Legend. Groups of 9-10 BALB/c mice were mock treated (A) or immunized either with formalin- (B), UV- (C) or gamma-irradiated A/PC (D). Three weeks after the immunization, naïve and immunized mice were intranasally infected with A/PR8. Infected mice were monitored daily for weight loss.



H1N1 protects against H5N1 (Bird Flu)

Intranasal vaccination with gamma-irradiated influenza virus A/PR8 (H1N1) protects against heterotypic challenge with A/Vietnam/1203/2004[H5N1] (Bird Flu)¹.



Legend. Groups of 10 BALB/c mice were either mock treated (A) or vaccinated with gamma-irradiated A/PR8 (B). Mice were challenged intranasally 4 weeks later with 3 MID50 of A/Vietnam/1203/2004[H5N1] and weight recorded daily.

The Scale of the Opportunity

Unlike seasonal flu vaccines that fail to induce protection even against drifted influenza viruses of the same subtype, gamma-irradiated influenza virus vaccines have afforded protection against all influenza A strains tested.

Gamma-Flu Vaccine	Tested Protection Against
H1N1 (A/PR8)	H3N2 (A/PC) H5N1 (Bird Flu)
H2N3 (A/PC)	H1N1 (A/PR8) H5N1 (Bird Flu)
H2N2 (A/JAP)	H1N1 (A/WSN3) H3N2 (A/PC)

Corporate Strategy

Gamma Vaccines is seeking corporate co-development partners and/or licensing opportunities for its proprietary technology.

Acknowledgement

We are proudly assisted by Business and Industry Development, ACT Government.

¹Alsharifi et al (2009) Intranasal Flu Vaccine Protective Against Seasonal and H5N1 Avian Influenza Infections. PLoS One 4 (4), e5336. www.plosone.org

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