Istvan Toth, J Pharm Drug Deliv Res 2016, 5:3(Suppl)
http://dx.doi.org/10.4172/2325-9604.C1.007

9th World Drug Delivery Summit

June 30-July 02, 2016 New Orleans, USA

Istvan Toth
The University of Queensland, Australia

Self-adjuvanting vaccine design to control fertility and prevent infectious diseases

Immunocastration using gonadotropin-releasing hormone (GnRH)-based vaccines has been investigated in rams to control fertility. A GnRH-lipopeptide vaccine (GnRH-LP) including two copies of GnRH, lipids (2-amino-D, L-hexadecanoic acid) and a ram specific T helper epitope was designed and synthesised. Rams were vaccinated with or without additional adjuvant. In both groups anti-GnRH antibodies were generated. Additionally rams showed a marked decrease in testicular size, providing the basis for an effective immunocastration. The attachment of synthetic lipids to peptide antigens has been shown to effectively increase the immune response to poorly immunogenic peptide antigens. Furthermore, dendritic polypeptides, polymeric nanoparticles, and carbohydrates provide multiple attachment points for peptides. The conjugation of multiple copies of a single peptide to a carrier has been demonstrated to produce higher antibody responses than a single peptide epitope. Therefore, the conjugation of the lipid core peptide (LCP) system (adjuvant) with sugar units (carrier) represents one of the most important strategies currently under investigation for drug delivery. The LCP-system has been demonstrated to adjuvant peptide epitopes from several group A *streptococcal* (GAS) strains. GAS is one of the most common human pathogens, and causes a wide range of infections, including: acute rheumatic fever, rheumatic heart disease, and acute glomerulonephritis. Opsonic antibodies directed against the surface M protein, a major virulence factor of GAS, mediate protection against GAS infection.

Biography

Istvan Toth is a Chemical Engineer, ARC Australia Professorial Fellow, Chair in Biological Chemistry and Professor of Pharmacy at the University of Queensland. His major research interest these days is drug, vaccine and gene delivery. He is active in research commercialization as one of the key Founders of Alchemia (ASX listed), Implicit Bioscience, Neurotide and TetraQ. He has more than 300 peer-reviewed publications and 43 patents. He is the Editor-in-Chief of *Current Drug Delivery* and *Drug Delivery Letters*. He is a Fellow of the Royal Australian Chemical Institute (FRACI) and the Queensland Academy of Science and Art (FQA).

i.toth@uq.edu.au