

Trinity immunologists find new ways to beat the 'bad guys' (w/ Video)

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Transmission electron micrograph (TEM) of Zika virus. Credit: Cynthia Goldsmith/Centers for Disease Control and Prevention

From the current outbreak of the Zika virus to last year's Ebola, vaccines have a significant contribution to make in terms of public health. But why are they so important?

Our [immune system](#) protects the body from pathogens. These are the 'bad guys', usually in the form of bacteria and viruses, that can cause infection.

Vaccines are like pathogen imposters - they mimic these 'bad guys' in order to provoke a response from our immune systems, remove the invader and begin the healing process.

One of the key components in a vaccine is an adjuvant, which serves to enhance our body's immune response to vaccination. Adjuvants have been around for almost a century however it is only recently that scientists are beginning to fully understand how they work.

New and improved adjuvants are needed to develop effective vaccines for TB, malaria, HIV and some cancers, diseases which require 'cell-mediated immunity' to confer protection. In order for this to happen, a better understanding of how adjuvants work is needed.

Now a discovery by immunologists at Trinity College Dublin, which has just been published in the journal *Immunity*, sheds light on this mystery, providing a vital clue as to the way in which adjuvants go about doing their job.

Professor in Immunology Ed Lavelle, from Trinity's School of Biochemistry and Immunology, and Dr Elizabeth Carroll have uncovered the mechanism by which a promising vaccine adjuvant, chitosan, induces an immune response. The Trinity team's discovery provides a roadmap to develop vaccines that trigger 'cell-mediated immunity'.

Professor Lavelle, lead researcher on the project, commented: "Our discovery that a cationic polysaccharide can activate a DNA-sensing pathway in cells is surprising - as this pathway mainly senses pathogens - and provides exciting new perspectives for the design of [adjuvants](#) for

promoting cell-mediated immunity."

Provided by Trinity College Dublin

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