New method for evaluating vaccine safety

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A research group at the University of Turku, Finland, has led the development of a new method to evaluate vaccine safety. The new method may significantly reduce the use of animal testing in the vaccine industry.

Vaccines are safe and potent pharmaceutical products that prevent infectious diseases caused by viruses and bacteria, and reduce the spread of pathogens among the population. A vaccine prevents an infectious disease because the body develops an ability to recognize and destroy the pathogen. Vaccines are generally designed from a weakened pathogen, or parts of it. The vaccine industry uses effective methods to ensure vaccine safety, and constantly develops new methods as well.

The pertussis vaccine, which also belongs to the Finnish national vaccination program, contains the surface structures of the pertussis bacteria and inactivated forms of the pertussis toxin produced by the bacteria. The pertussis toxin attaches to the surface of the cell, penetrates it, and destroys the vital control system of the cell.

The research group at the University of Turku has led the development of the new method that can be used to ensure the safety of the pertussis toxin in the pertussis vaccine. The new iGIST method (Interference in Gαi-mediated Signal Transduction) detects how the pertussis toxin destroys the vital control system of the cell.

"Compared to the current methods in the vaccine industry, iGIST is more effective and enables the detection of up to 100 times lower levels of pertussis toxin. iGIST is entirely based on using laboratory grown, human-based cells. Therefore, it may significantly reduce the use of animal testing in the vaccine industry," says Dr. Arto Pulliainen from the University of Turku who was the principal investigator of the research group that was in charge of developing the method.

More information: Valeriy M. Paramonov et al. iGIST—A Kinetic Bioassay for Pertussis Toxin Based on Its Effect on Inhibitory GPCR Signaling, *ACS Sensors* (2020). DOI: 10.1021/acssensors.0c01340

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