

Chair of Microbiology participates in Inno4vac, a European new public-private partnership to innovate vaccine development

The Innovative Medicines Initiative 2 (IMI2) Joint Undertaking mobilised more than € 33 million to support Inno4vac, an innovative public-private partnership to accelerate vaccine R&D timelines. It will focus on the design and application of new and highly advanced predictive models to allow a faster development and manufacturing of novel vaccines.

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Vaccination is one of the most impactful public health interventions in history, saving the lives of an estimated 2.5 million people¹ every year and protecting millions more from illness and disability. Classical vaccine research and development timelines remain nevertheless long and costly, as it takes on average more than 10 years and costs more than € 800 million² to bring a new vaccine to the market. Leveraging advances in technology and data science will be instrumental in providing new paths to vaccine development as the accelerated development of COVID vaccines demonstrated.

Inno4vac is a new interdisciplinary project funded by the Innovative Medicines Initiative 2 (IMI2) that aims to foster health innovation by incorporating scientific and technological breakthrough from the academic and biotech sectors into industry. It is coordinated by the European Vaccine Initiative (Germany), with the support from the Sclavo Vaccines Association (Italy), for the scientific coordination, and involves 41 partners from 11 different European countries, including 37 academic institutions and SMEs, as well as GSK, Sanofi Pasteur, CureVac and Takeda as industry partners.

Four main areas will be addressed by **Inno4vac** in an integrated manner:

- (1) artificial intelligence will be used for *in silico* vaccine immune response and efficacy prediction;
- (2) a modular computational platform will be developed for *in silico* modelling of vaccine bio-manufacturing and stability testing;
- (3) new and improved controlled human infection models (CHIM) of *influenza*, *Respiratory Syncytial Virus* (RSV) and *Clostridium difficile* will be established to enable early vaccine efficacy evaluation, and
- (4) novel cell-based human *in vitro* 3D models will be developed to reliably predict immune protection.

The ultimate goal of the combined effort pursued by **Inno4vac** is to **develop more predictive biological and mathematical models of vaccine performance, and thereby to accelerate the development of new vaccines**. The design of a sustainability plan will also be carried out by the project partners to ensure the long-term access to the project results, including models, beyond the duration of the **Inno4vac** project.

Within this Inno4vac initiative the **Chair of Microbiology** aims at the development of complex infection models of the urovaginal mucosa with features close to the native human tissue regarding architecture and physiology as well as cell autonomous immune response. These models will be used to explore the feasibility of exploiting immune cells of innate and adaptive immunity. We will focus on *Neisseria gonorrhoeae* to establish infection models. These tissue models will be used for testing and validating vaccination strategies.

Quick facts about Inno4vac:

Start Date: 01/09/2021

End Date: 28/02/2027

Coordinator: European Vaccine Initiative (EVI)

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GlaxoSmithKline Biologicals SA, BE
Sanofi Pasteur SA, FR
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CureVac AG, DE

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