

GSK

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# Looking for the collaboration of a lifetime

Whilst continuing to nurture its existing collaborations, GSK is seeking new partners—from academia to biotech and pharma—to harness the skills and expertise of scientists and enable the creation of the next generation of vaccines.

GSK has made contributing to the improvement of global health through innovative vaccines central to its objectives. The company's mission is built upon two pillars: a science-led approach to discovering and developing new vaccines, and a recognition that its R&D is improved by collaboration with external partners.

In pursuing the continuous innovation needed to develop vaccines that help to protect people from diseases from birth to old age, GSK Vaccines has entered into more than 180 scientific collaborations while investing £597 million in R&D in 2016.

GSK is seeking more collaborations (Box 1). As a leading vaccine developer, GSK wants to combine the skills of its 2,000 scientists at R&D sites in Rixensart (Belgium), Rockville (Maryland, USA) and Siena (Italy), with the ideas and capabilities of academic groups—including graduate and postdoctoral research programs—biotechs, consortia, charities, and fellow pharmaceutical companies. Each proposal for a new scientific or technological opportunity is evaluated by experts in vaccine R&D.

The breadth of the types of organizations GSK collaborates with is testament to the company's inclusive approach to partnerships. GSK forms strategic relationships from early-stage research to late-phase development, and deploys whichever collaborative model is best suited to delivering the right result.

## Box 1: Areas of interest for potential partnerships with GSK Vaccines R&D

### Fundamental and applied immunology

- Understanding host–pathogen interactions, understanding immune responses to infectious diseases and vaccines, and developing new protective antigens. New immunization strategies and technologies

### New vaccine targets

- Discovering targets for infectious diseases (bacterial and viral diseases and diseases prevalent in the developing world) and noninfectious diseases

### Adjuvants

- Developing new approaches to modulate the immune system, and understanding the mechanism of action of adjuvants

### Antigen delivery

- Developing nanoparticles and virus-like particles and investigating antigen stability. Working with vectors, RNA, and new antigen-presentation platforms

### Vaccine delivery

- Developing mucosal, oral, sublingual, nasal and intradermal delivery methods and devices; thermostability

## GSK's vaccine development pipeline

Global Health: GSK is working towards broad solutions aimed at protecting individuals against infectious diseases throughout their life (maternal, pediatric, adolescent, adult and elderly), wherever they live in the world.

<p><b>Shingrix</b> (Zoster candidate vaccine)* †</p> <p>MMR (measles, mumps, rubella) USA</p>	<p><b>Ebola†</b></p> <p><b>Group B Streptococcus</b></p> <p><b>S. pneumoniae next generation †</b></p> <p><b>Hepatitis C †</b></p> <p><b>Malaria next generation †</b></p> <p><b>Meningococcal ABCWY</b></p> <p><b>Shigella †</b></p> <p><b>Tuberculosis†</b></p> <p><b>RSV (Respiratory Syncytial Virus)</b></p> <p><b>RSV (maternal immunization)</b></p> <p><b>HIV (Human Immunodeficiency Virus)†</b></p>	<p><b>COPD† (Chronic Obstructive Pulmonary Disorder)</b></p> <p><b>Other infectious diseases</b></p>	 Global Health
Short/mid term	Long term	New vaccine concept	

\*The name 'Shingrix' has not yet been approved for use by any regulatory authority

† In-license or other alliance relationship with third party

GSK seeks to understand how the different perspectives, needs, and priorities of its network of academic, public, and industry collaborators can further vaccine R&D. GSK is instilling this spirit in the next generation of vaccinologists through the courses and opportunities it provides for PhD and postdoc scholars.

The company takes a similarly inclusive approach to helping to protect people from disease. Rather than limiting itself to one area, GSK is working across fields, from maternal immunization and support for

healthy aging, to anticipation of infectious disease outbreaks and approaches to counter antimicrobial resistance.

## Collaboration in action

GSK's approach is evident in its list of current and historical collaborations. For the RSV Consortium in Europe (RESCEU), an Innovative Medicines Initiative (IMI) project, GSK has joined more than 50 teams from academia, patient groups, pharma, regulatory agencies, and other fields to integrate knowledge about respiratory syncytial virus (RSV).

The breadth of the collaboration and the scale of its ambition—to develop a vaccine against a virus that can cause severe disease in the very young, the elderly, and high-risk populations, and that was associated with 66,000–199,000 deaths worldwide in children under 5 years old in 2005<sup>1</sup>—are in line with GSK's approach to vaccines.

Other alliances are smaller but similarly impactful. In collaboration with AERAS, GSK is cofunding a large proof-of-concept study and helping to develop a tuberculosis vaccine candidate, one of 14 candidate vaccines in its pipeline.

The many different types of collaborations in which GSK is active are testimony to its willingness to be flexible in order to achieve the best outcome.

1. Nair, H. *et al. Lancet* 375, 1545–1555 (2010).

contact

Philippe Denoël, Head of External R&D  
GSK Vaccines  
Rixensart, Belgium  
E-mail: vaccinespartnering@gsk.com