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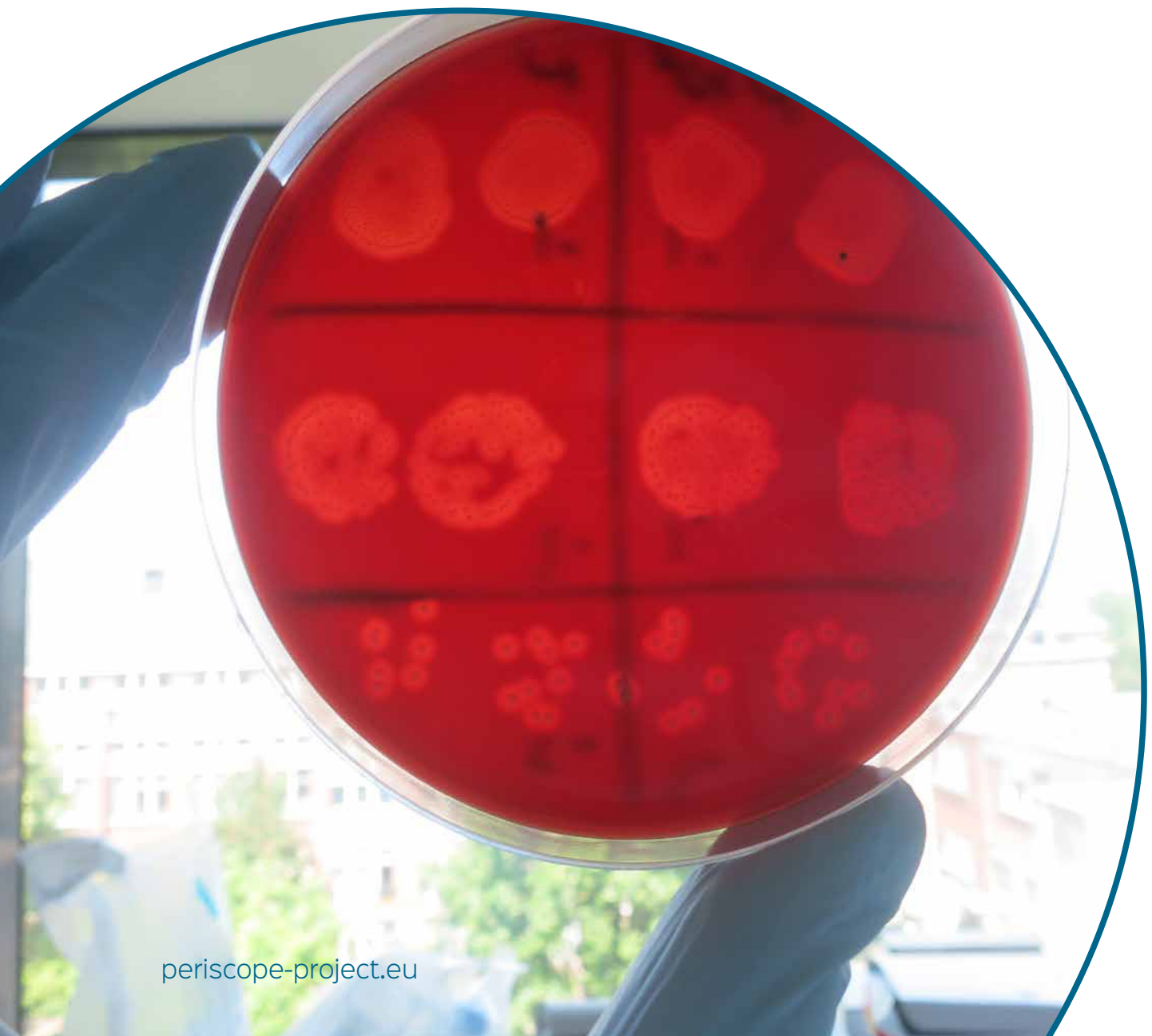
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PERtussIS COrrelates of Protection Europe

Newsletter Issue 9 - December 2020



Editorial

Dear colleagues and followers of the PERISCOPE Newsletters,

The impact of the COVID-19 pandemic on PERISCOPE is significant. Indeed, the Corona virus outbreak in Europe and Africa has led to shut-down measures by the national governments resulting in cessation or slow-down of regular PERISCOPE research activities. Many of PERISCOPE's academic and EFPIA partners have also reoriented their activities to participate to the global effort to fight the COVID-19 pandemic.

Several on-going clinical studies had to pause the enrolment of new participants. The Gambia Pertussis study (GaPs) investigating the immune responses of infants who receive either acellular or whole-cell vaccines in Gambia (<https://periscope-project.eu/news-and-events/the-gaps-trial-has-started/>), has recorded a significantly reduced number of data during the follow-up of the study, as no biological samples could be collected with only safety follow up allowed. The Gap study has now restarted and we feel confident it will reach its objectives. Additionally, the recruitment for the Maternal pertussis Immunization in Finland (MIFI) study is slowed down because of the COVID-19 pandemic. This also has an impact on the laboratory analysis since many laboratory-based scientists had to dedicate their effort and facilities to the fight against Covid-19. They also face capacity issues as the schedule for many clinical study samples is delayed as well as on the subsequent integrated bioinformatic analysis.

This has truly been a challenging time for all partners. Significant efforts were made to mitigate the impact of COVID-19 on PERISCOPE, with activities being redirected towards data analysis as much as possible.

Now that the first vaccines against COVID-19 will become available thanks to this exceptional global effort to fight the pandemic, we feel confident that PERISCOPE will successfully deliver on our overall objective.

Facts

The PERISCOPE consortium unites internationally renowned experts in the largest public-private partnership in Pertussis Vaccine Research in Europe. It was launched in March 2016 receiving support from the Innovative Medicines Initiative (IMI), a joint undertaking of the European Commission and the European Federation of Pharmaceutical Industries and Associations (EFPIA). Additionally, PERISCOPE is the first IMI project to receive funding from the Bill & Melinda Gates Foundation (BMGF). The participating experts combine many years of experience in *Bordetella pertussis* (Bp) research, clinical trials, bioinformatics, immunology and public health.

Acronym:	PERISCOPE
Full title:	PERTussIS CORrelates of Protection Europe
Call Topic:	IMI2-2015-03-05 - Vaccines
Contract N°:	115910
Duration:	60 months (01/03/2016 -28/02/2021)
Funding:	28.000.000 €
Partners:	21
Website:	www.periscope-project.eu

PERISCOPE has received funding from the Innovative Medicines Initiative 2 Joint Undertaking under grant agreement No 115910.

This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and EFPIA and BMGF.

Objectives of the PERISCOPE project

The PERISCOPE consortium seeks to create an environment conducive to the development of a new generation of pertussis vaccines by facilitating collaboration between Pertussis stakeholders, particularly from vaccines manufacturing and the academic and public research communities in Europe.

The key objective of the project is to gain a better understanding of the immune mechanisms needed to ensure long lasting immunity to Pertussis in humans. This will be achieved by investigating of the immune response generated by infection and colonization of *Bordetella pertussis* and comparing the immune response to whole-cell and acellular Pertussis vaccines in humans and preclinical models. To achieve this goal, the consortium aims to develop an extensive toolbox of bioassays to apply in vaccination studies in Europe and the Gambia. It is expected that the data generated will ultimately allow the vaccine-R&D community to define an ideal immunological profile or signature that vaccines need to generate to ensure durable protection against Pertussis infection and disease in humans.

Watch PERISCOPE at the ESPID 2020 virtual meeting !

From 26-29 October 2020 over 3,100 professionals from 115 countries gathered at the first ever virtual meeting of the European Society for Paediatric Infectious Diseases (ESPID). As part of this event, the PERISCOPE consortium organized a research session chaired by PERISCOPE experts Dimitri Diavatopoulos (Radboud University Medical Center, The Netherlands) and Ulrich Heininger

(University of Basel Children's Hospital, Switzerland).

The topics and experts from PERISCOPE were:

- Short introduction on PERISCOPE by *Dimitri Diavatopoulos (RUMC)*
- Overview on ongoing clinical vaccine studies by *Dominic Kelly (University of Oxford)*
- The human B. pertussis challenge model by *Hans de Graaf (University of Southampton)*
- Antibody assays to measure pertussis vaccine responses by *Andrew Gorringe (Public Health England)*

At the end of the symposium, a lively discussion of the 3 presentations took place. We would like to thank the organisers of the meeting for the opportunity to host this research symposium and the ESPID board for allowing us to share the recording of the PERISCOPE symposium **Pertussis: the road towards effective control** here with you Enjoy!

<http://periscope-project.eu/news-and-events/esp-id-2020-virtual-meeting/>

What opportunities does PERISCOPE offer to young scientists ?

Education of young scientists in vaccinology, especially targeting pertussis, and in the use of state-of-the-art technological tools to discover biomarkers of protection is an important priority for the PERISCOPE consortium. Many training courses (e.g. workshops on specific assays, EuroFlow training courses) have been and continue to be organized by PERISCOPE members

We asked two junior scientists involved in the project, what opportunities the PERISCOPE consortium offered them to develop their expertise and networks.



Muktar Ibrahim (PhD candidate)
University of Southampton, UK

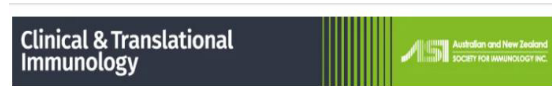
“Being a part of the PERISCOPE study has given me the dual opportunities of being able to develop my research career with a PhD studentship and also to be part of a large multinational study. Professionally being part of the human challenge study has been challenging at times, but also very rewarding as I have been able to develop new skills in molecular microbiology such as developing novel qPCR assays. Working on the PERISCOPE study has also allowed to learn from colleagues at other institutions within the consortium, as well as travelling to attend annual meetings which have been great opportunities to build friendships, professional networks and further collaborations. The peak of the pertussis resurgence in the UK occurred at the start of my career in diagnostic microbiology and was also the first time I had seen *B. pertussis* isolated from a clinical diagnostic sample. So, further on in my career, the opportunity to be involved in a large EU study trying to determine a correlate of protection against pertussis infection has been a privilege.



Alex-Mikael Barkoff (PhD candidate)
University of Turku, Finland

“The PERISCOPE experience is so far the largest project where I have been involved, including multiple challenges, but also several moments of joy and success. The whole project has offered me a deep insight on prospective clinical studies, requirements needed and how to co-operate between many study sites to achieve the desired outcome. I have been able to develop my own skills, especially the EUROFLOW and T cell assay development have expanded my knowledge, whereas I have also learned several small but important things regarding immunology from other experts within the PERISCOPE community. Sometimes you are hit by frustration, but due to the well-assembled entity, help has been available from many directions. Furthermore, my list of international contacts has expanded and is now covering a wide variety of wisdom for further collaboration. PERISCOPE has also given me new thoughts for my future career and I would like to thank the whole PERISCOPE society for the fantastic trip so far. “

PERISCOPE's scientists published in *Clinical and Translational Immunology*



Original Article | Open Access |

Differences in epitope-specific antibodies to pertussis toxin after infection and acellular vaccinations

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First published: 02 August 2020 | <https://doi.org/10.1002/cti2.1161>

Pertussis toxin (PT) is one of the main virulence factors of *Bordetella pertussis*, and it is included in every acellular pertussis vaccine (aP). The toxin consists of five subunits (S1-S5) and must be detoxified to be used in aP vaccines. Chemical detoxification of PT results in conformational changes in its functional epitopes. Therefore, induced epitope-specific antibodies (ESA) could reveal biomarkers implicated for protection and successful immunization. We compared ESA from aP vaccinated children and serologically confirmed disease patients. Both groups induced considerable antibody titers to subunit 1. Of interest, subunit 3 -ESAs were present in patients, but not after vaccinations with aPs, which suggests these epitopes to be functionally relevant in protection. Overall, we found ESAs to be influenced by several factors: by infection or vaccination background, by the method used for detoxification of PT, and by the amount of toxin used in immunization. To further understand the overall interplay of vaccine-induced antibody response, it will be of high interest and importance to elucidate functional antibodies including ESAs from PERISCOPE clinical studies.

PERISCOPE Stakeholder meeting 2021 in Ghent, Belgium

Due to the Covid-19 pandemic, we had to postpone the 2020 stakeholder meeting to June 15th, 2021 in Ghent, Belgium.



The topic of the 2021 stakeholder meeting will be: ***“New models for development of next generation pertussis vaccines: potential impact on regulatory pathway”***.

More information coming soon.

About PERISCOPE- *Progress beyond state of the art*

Beyond the public health objectives of PERISCOPE, the project stimulates connections among the Pertussis research community in Europe and beyond. It is expected that this network of stakeholders will continue to contribute to the development of novel vaccines and immunization methodologies beyond the life of the project. A variety of virtual discussion forums and meetings have been held throughout this fourth year of the program. Through these discussions, areas for future work were identified, new interfaces created among partners and long-standing collaborative links strengthened. This has already had a positive impact on the Pertussis community in Europe and beyond.

Bringing together industrial and academic partners with different approaches and working practices means that both learn from each other, not only about what they do, but also how they do it.

Partners and experts in PERISCOPE

The PERISCOPE consortium brings together internationally renowned scientists with many years of experience in *Bordetella pertussis* (Bp) research, clinical trials, bioinformatics, immunology and public health.

We wish you all a happy end of the year!

