

## PERSIMUNE SCIENTIFIC ANNUAL REPORT 2023

### Annual highlights

2023 was another productive year for PERSIMUNE. A total of 38 papers were published across the fields outlined in the research plan from 2019, four of which in high-impact journals (IF>8). These works reflect a successful unfolding of the research plan, and the successes are a testament to the dedication, motivation and professionalism of the staff affiliated with the center. Below are some highlights:

- PERSIMUNE is developing novel immune tracers. In 2023, researchers within this area have established a robust and reproducible methodology for the generation of these tracers and continue to inform the field on how to generate peptide-based tracers for in human testing – including best practices for using next generation sequencing in identifying best peptide candidates
- The centre continues to develop expertise in analytic methods for the analysis of host genetics data while also leading the development of novel methods. In 2023, these methods, ranging from single nucleotide associations to the development of polygenetic risk scores, have been applied to a variety of patient cohorts studied as part of the center’s work to identify and/or validate genetic factors associated with infectious complications.
- One of the overarching aims of PERSIMUNE is to use molecular profiling and bioinformatics methodologies to reveal novel insights into different immune dysfunctional patient groups. In 2023, two papers, which exemplified this approach, were highlighted by the journals which published them:
  - Adrian Zucco and colleagues integrated clinical, demographic, host genetic and HIV genetic data to identify functionally related HLA types that may influence HIV disease progression in a multiethnic population of people with HIV ([Zucco et al. 2023](#)). This project highlights the importance of characterizing both the host and the infecting agent when conducting precision medicine research into infectious complications, validating the time and effort many PERSIMUNE researchers have spent on both elements. This work was the subject of an editorial comment from a leading population geneticist in infectious disease ([Mclaren, 2023](#)) – outlining the importance of this approach and the results of the manuscript.
  - Kirstine Rasmussen and colleagues integrated comprehensive profiling of plasma metabolites and lipids with more traditional clinical data to validate prior literature associations between metabolite profiles and CMV infection as well as identifying novel clusters of metabolites and lipids associated with clinical traits. An additional output of this work was an interactive open access platform for exploring the data, which serves to bring the reader closer to the research – this article was published in the journal *Metabolites* in 2023 and selected as the cover article for the specific issue ([Rasmussen et al. 2023](#)).
- Finally, a major output of the PERSIMUNE project is the Data lake and the ability of this resource to service multiple research projects aligned with the PERSIMUNE research plan. Over the course of 2023, the data lake and PERSIMUNE staff provided 31 data extracts to data to 22 different projects. These outputs serve as the groundwork for high impact publications and therefore warrant highlighting here and further in the report.

Besides the scientific outputs, PERSIMUNE members have engaged in several other activities, such as teaching in the [Master in Personalized Medicine](#) course at Copenhagen University, (<https://personligmedicin.ku.dk/kursus/evidens/>), explaining ongoing research via short videos shared in social media and organizing colloquia where people with interest in personalized medicine can meet, discuss, strengthen collaborations and get inspiration for current and future projects.