

## PERSIMUNE SCIENTIFIC ANNUAL REPORT 2018

### Annual highlights:

The primary results of the international randomized controlled multicenter trial 'Cooling And Surviving Septic shock (CASS)' were published in The Lancet Respiratory Medicine (<https://www.ncbi.nlm.nih.gov/pubmed/29325753>). An outstanding question for decades has been whether lowering the body temperature during severe infection would improve survival. Among patients with septic shock and ventilator-dependent respiratory failure, however, induced hypothermia did not reduce mortality. The trial's main conclusion was that induced hypothermia should not be used in patients with septic shock. The data- and biobank established during this and previous trials now include more than 1600 highly characterized critically ill patients. Utilizing this data material, the group is pursuing to establish a biological characterization of the septic phenotypes that could form the basis for a personalized treatment intervention for patients with sepsis.

In collaboration with the departments of oncology and haematology, PERSIMUNE has investigated risk factors from experiencing febrile neutropenia – the most feared complication from receiving chemotherapy (<https://academic.oup.com/ofid/article/5/10/ofy255/5144574>). We succeeded in developing algorithms able to reliably predict the patient's risk of febrile neutropenia – the FEbrile Neutropenia after ChEmotherapy (FENCE) score (<https://academic.oup.com/jncics/article/2/4/pky053/5219028>). The study included more than 9000 consecutive treatment-naïve patients with solid cancers or diffuse large B cell lymphomas. The FENCE score and the clinical application that enables clinicians to calculate an individual's risk will be available online and can be incorporated into a clinical system allowing for instant calculation of a risk estimate of developing febrile neutropenia. The FENCE score can also be used to guide prophylactic measures such as antibiotics, and intensity of patient monitoring. Future research efforts to better understand the biological mechanisms explaining the variation in vulnerability are required in order to further improve the predictive ability of the FENCE score. Also, interventions aimed at preventing febrile neutropenia in the most susceptible patients will be examined.

The entire Danish population was used to examine whether patterns of disease clusters was associated subsequent development of various types of cancers (<http://cancerres.aacrjournals.org/content/79/4/864.long>). The pattern of morbidities preceding the diagnosis of diseases requiring immune modulating treatment, could potentially explain some of the variation in immune-related complications post-treatment. This national population wide analyses was able to address this, and an extensive catalog of significant patterns preceding the development of cancer was developed. The findings are hypothesis generating. Of note, the disease-data used rely currently on the routine diagnostic classification made during hospitalization only, and efforts will be made to finesse this information as part of the data-lake the centre has created.