



## Project DK-1

### Evaluation of fungal complement evasion mechanisms via the lectin pathway (Supervisors: Prof. Peter Garred, Prof. Jörg Köhl)

The group of professor Peter Garred at the University of Copenhagen has deciphered the components of the lectin complement pathway. The lectin pathway has been shown to be a central component of innate immunity. With more than 1.5 million deaths a year worldwide, opportunistic fungal infections represent an increasing global health problem. Patients with malignant hematological diseases undergoing high dose chemotherapy or allogeneic hematopoietic cell transplantation suffer from a severe loss of adaptive and cellular immune function by the underlying disease and treatment protocol. These patients are at high risk of being infected with opportunistic fungal pathogens like *Candida* and *Aspergillus*. Despite prophylactic antifungal treatment, infections with these fungi still constitute a severe clinical problem associated with high mortality rates. Our hypothesis is that the lectin pathway is particularly relevant in protection against fungi in immunosuppressed individuals

In this project, we offer a PhD study investigating the role of the lectin pathway in the pathophysiology of fungal infections. The PhD candidate will study the binding of the different pattern recognition molecules to fungi and how they promote downstream complement activation and how they interact with cells. The other objective is to investigate how the fungi evade the lectin pathway, but also how they exploit the lectin pathway to become more pathogenic. In Copenhagen, different *ex vivo* human models will be used in order to define the molecular mechanisms of importance that may lead to protection against fungal infections, but also the molecular mechanisms that may contribute to disseminated invasive infections. To achieve these goals, a variety of molecular, cellular, and protein-based techniques will be employed. Furthermore, it is considered to work with a unique new model to differentiate between innate and adaptive immune mechanisms.

The second part of the study will be performed at the University of Lübeck in professor Jörg Köhl's laboratory where the role of the so-called complement anaphylatoxin receptors in pathophysiology of fungal infections will be studied. We hope that this work will pave the way for new treatment modalities to help our patients suffering from severe infections.

#### General description of your individual PhD-schedule:

- Your main university will be University of Copenhagen (Denmark) with Prof. Garred as supervisor.
- You will have a 6-months research secondment at University of Lübeck (Germany) with Prof. Köhl as supervisor, where you continue to scientifically work on your thesis project.
- You will have a further 6-months research secondment at Statens Serum Institut (Copenhagen, Denmark) where you will do experiments with opportunistic bacteria.
- You will have a 1-month clinical training at Tirol Kliniken (Innsbruck, Austria).
- You will have a 1-month entrepreneur training at Statens Serum Institut.
- You will finally receive a PhD issued by University of Copenhagen and University of Lübeck if you fulfil the respective requirements.

#### Application

The position is advertised from 10.09.2019 – 10.11.2019 on [www.corvos.eu](http://www.corvos.eu). Please apply via this homepage during that time.