

# Helping patients using basic biochemistry

*Meet a biochemist and crystallographer with keen interest in the biology of type III interferon and how genetic variation in the type III IFN gene loci influences the ability of humans to clear viral infections.*

Rune Hartmann is Associate Professor at the department of Molecular Biology and Genetics at Aarhus University in Denmark. His journey from a PhD in molecular biology to an important contributor to the field of immunology has been very successful. After his dissertation, Rune Hartmann went to Cleveland, Ohio and started to work with Vivien Yee and Ganes Sen on the structure of a family of proteins known as OAS. This family of proteins inhibits viral replication in infected cells and is strongly induced by interferons.

– At that time the Cleveland Clinic was home to one of the strongest research communities in interferon research and during the four years I spent there I acquired a strong interest in interferons, he says.

However his interest in interferons and the innate immune system started much earlier, during a period as an exchange student in Vienna.

– There I met with an immunology professor, Thomas Decker, who made a great impression on me and at least indirectly was the reason for me starting to look for a research project in innate immunology once I got back to Aarhus.

In 2004 Rune Hartmann received a career development grant from the Novo Nordisk foundation and returned to Denmark to start his own research group. At that time type III interferons had just been discovered by two independent research teams, and he decided to move into this interesting field.

Today, Rune Hartmann has started exploring clinical implications of genetic variation in the type III interferon loci upon hepatitis C virus-treatment. As well as uncovering novel mutations involved in immunodeficiencies he was recently part of an international team which identified a previously unknown mutation in a gene – known as IRF3 – to cause herpes simplex encephalitis in patients.

– It is a very interesting problem for a biochemist. You have 20 patients, each with up to four point mutations, and have to find out which of these are causative. We used our entire basic biochemistry toolbox to help these patients. I think we will be doing a lot more studies like this in the future.

In addition to his research, Rune Hartmann teaches immunology at the Faculty of Natural Science at Aarhus University.

–Initially this was a challenge to me because I was a biochemist and crystallographer, but you learn a lot when you teach.

Even though he started out in another area of science, Rune Hartmann is now active in the field of immunology and is a member of the Danish Society for Immunology, a society he finds very useful.

– It is good to have a forum to meet. In addition, the national meetings are very good places for students to practice giving presentations. It is official and professional, but not as intimidating as big international congresses, he says before finishing the interview, returning to the busy life of a scientist, with grant applications, manuscripts and experiments waiting to be completed.