Universitätsklinikum Hamburg-Eppendorf

Postdoctoral/PhD positions are available in the laboratory of Nicola Gagliani and Samuel Huber at the Molecular Immunobiology and Gastroenterology Center, Hamburg-Eppendorf University Hospital (Germany). We are looking for highly motivated candidates with a strong interest in Basic Immunoloy and Translational Immunology.

Autoimmune-mediated diseases and chronic inflammatory diseases are the third leading cause of mortality in developed countries, and the prevalence of these diseases is increasing. Furthermore, chronic inflammation can drive the development and progression of cancer (Huber S. & Gagliani N. et al., 2012 Nature; Gagliani N. et al., Cell, 2014). CD4 T helper cells and innate lymphoid cells (ILCs) not only protect the host against lethal infection, but also have the ability to differentiate into pathogenic cells and mediate the effects seen in immune mediated diseases. Our aim is to study the causes and the mechanisms of these lethal chronic immune responses and reveal unexplored therapeutic strategies.

In particular, we are interested in understanding whether CD4 T helper cells and ILC differentiation is a linear, irreversible process, which ends with terminally differentiated cells, or if it is a more dynamic phenomenon with preserved plastic potential. Studying the molecular mechanisms responsible for cell plasticity could make it possible to therapeutically reset the immune system and avoid the progression of diseases mediated by chronic inflammation. We have developed a large number of transgenic mouse models to study the plasticity of CD4 T helper cells and ILCs and the implications directly *in vivo* (Gagliani N. et al., Nature, 2015). We are also developing a single cell transcriptome analysis to define the molecular mechanism responsible for cell plasticity at single cell level. By integrating system biology with experimental approaches we aim to identify the molecular mechanism, which orchestrates the dynamic cell biology of T helper cells and ILCs. This will move our understanding beyond viewing these cells as small groups of numbered subsets. In addition, it will allow us to finally recognize their potentially enormous diversity and, in turn, their intrinsic therapeutic opportunities..

Successful applicants are expected to have a strong and proven scientific background and knowledge of Molecular Biology and Cellular Biology. Experience with mouse models and tissue culture is highly preferred.

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