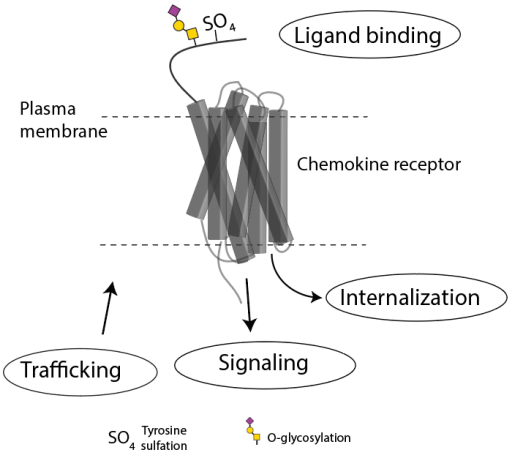
Understanding the “Glycosulfo” Barcode of Chemokine Recognition

Background

The chemokine system is a central regulator of the immune system, controlling the migration and positioning of immune cells in development, homeostasis and inflammation. There is a great degree of promiscuity in the chemokine system with ligands, and receptors shared amongst each other. Tissue-specific expression of both chemokines and receptors further add to this complexity. The apparent promiscuity and our lack of understanding, remain a major challenge in drug discovery programs targeting chemokine receptors today.



Post-translational modifications (PTMs) are a fundamental phenomenon across all classes of life and several hundred different types have been identified. Well-known types of PTMs include glycosylation and sulfation. We have identified a novel pattern of glycosylation and tyrosine sulfation in the important N-termini of chemokine receptors – which we term the “glycosulfo barcode”. Understanding the regulation and specificity of this barcode will have implications for our general understanding of the chemokine system and regulation of the immune system. Furthermore, this may lead to new therapeutic opportunities for a number of diseases.

The Project

You will be trained in molecular pharmacology including cell based signaling and trafficking assays to decipher the effect of PTMs on down-stream signaling of chemokine receptors. You will also work with primary immune cells where you will assay the effect of PTMs by migration assays and live cell imaging. Binding affinities will be analyzed using flow cytometry. Other techniques that may be used, include western blotting, ELISA, cloning, single-cell sorting and RNA seq analysis.

The team

You will be a member of the Molecular Pharmacology Lab at 18.5 headed by Professor Mette Rosenkilde. The Lab is internationally and culturally diverse and consists of approximately 35 members with several current Master thesis students. Your daily supervisor will be post doc Christoffer Goth, who is leading the research project, however you will engage and collaborate with several other subgroups in the lab.

Your profile

We are looking for a highly motivated master student in i.e. Human biology, Molecular Pharmacology, Pharmaceutical Science, Biochemistry, Biology or similar. The candidate is interested in the molecular basis for receptor function and disease. Start date is flexible.

Contact for further information: Christoffer Goth: goth@sund.ku.dk , more background: pubmed.ncbi.nlm.nih.gov/32296765/, pubmed.ncbi.nlm.nih.gov/31927217/