



**Lung Inflammatory Disease
Program of Excellence in Glycosciences
Carbohydrate Synthesis Shared Resources Core (C)**

**GLYCAN SYNTHESIS, MICROARRAY &
CELL TARGETING TRAINING WORKSHOP**

THE SCRIPPS RESEARCH INSTITUTE

LA JOLLA, CA

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Overview: LID-PEG Training Workshop

The overall theme of this training workshop is the targeting of Siglec-2 (CD22) expressing cells with liposomes displaying synthetic glycan ligands of Siglec-2 identified by glycan microarray analysis. The development of targeted liposomal nanoparticles has gained increased attention for promising applications in human medicine for selective delivery of therapeutic agents. Targeting to the desired location is controlled by modification of the liposomal surface chemistry to display ligands recognized by a cell surface receptor. Siglecs, a family of sialic-acid-binding **Ig-like lectins**, which exhibit restricted expression to one or a few cell types of the immune system represent attractive targets for selective cell-directed therapies. Liposomal nanoparticles displaying high-affinity glycan ligands of Siglec-2 have been previously reported for targeting B lymphoma cells.

This training workshop will provide basic instruction into the background and steps involved in the development of glycan ligands for effective cell targeting. The course is divided into three training modules which will be conducted over a three day period. **The modules include; (i) Chemoenzymatic synthesis of glycans, (ii) The basics of glycan microarray design, printing and analysis, and (iii) In vitro cell targeting.** Instruction will include both didactic lectures and hands-on experience for the trainees. The contents of each individual module are designed to stand alone, however, the connection of the modules with the overall theme will be made.

The chemoenzymatic synthesis module will provide training in the enzymatic synthesis and purification of glycan ligands. The basic principles in the chemical and enzymatic synthesis of carbohydrates will be discussed. The hands-on component will address the steps of enzymatic synthesis from reaction initiation to product purification. The trainees will synthesize and purify a key ligand used for targeting Siglec-2 expressing cells.

The glycan microarray module will address ways to generate microarrays focusing on the mechanics of array design. The module will provide hands-on instruction in the design and creation of microarray print layouts. The trainees will have the opportunity to assay Siglec-2 on the custom microarray to identify potential ligands for cell-targeting.

The *in vitro* cell targeting module will provide hands-on experience with the preparation of liposomes incorporating specific ligands for cell targeting. Trainees will have the opportunity to evaluate liposome binding to whole cells expressing Siglec-2 using flow cytometry.

