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# Synthesis and Characterization of Immunologically Active Glycosphingolipids Isolated from *S. pneumoniae*

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## Synthesis of and Characterization of Immunologically Active Glycosphingolipids Isolated from *S. pneumoniae*

Carbohydrates fulfil many roles in biological systems including as structural supports, mediating cell signalling and acting as an energy supply. They also act as superantigens for the immune system when they are part of certain fat molecules called glycosphingolipids. These molecules are able to activate invariant Natural Killer T-Cells (iNKT cells), white blood cells that mount a dangerous non-specific systemic immune response that can potentially lead to death. However this same immune response, if controlled, has promise to act as a last line antiviral and/or a potential anticancer agent by potentially turning the immune system against previously ignored virus-infected or tumour cells. The Trant Team is making two such compounds recently isolated from pneumonia-causing bacteria; both have biological activity and bypass the non-polar lipid bilayer in the cells of the tissue they target. These compounds were first isolated in *Streptococcus pneumoniae*, a dangerous bacterial species that may be responsible for the existence of these iNKT cells in all mammals. However neither compound has been thoroughly investigated, and only the simplest one has been made. Our more efficient synthesis, the nanoparticle self-assembly behaviour of these materials, and possibly the preliminary immunological results obtained by our collaborators (Haeryfar group Immunology, Western) will be presented.