SYNTHESIS OF NEURAMINIDASE INHIBITORS AND *C*-LINKED POLYSIALIC ACIDS

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An Abstract of a Thesis Submitted to the Graduate

Faculty of Rensselaer Polytechnic Institute

In Partial Fulfillment of the

Requirements for the Degree of

MASTER OF SCIENCE

Major Subject: Organic Chemistry

The original of the complete thesis is on file
in the Rensselaer Polytechnic Institute Library

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November 2008
(For Graduation December 2008)

ABSTRACT

Neuraminidases are a group of enzymes that catalyzes the cleavages of the terminal neuraminic acid (Neu5Ac) attached to glycoproteins and glycolipids. They are best known as one of the enzymes found on the surface of influenza virus and play important roles on influenza virus replication. Design and synthesis of neuraminidase inhibitors would be an exciting approach to develop anti-virus agents. Neuraminic acid residues linked as *C*-glycosides are enzymatically stable and mimic enzyme substrates. We synthesized *C*-glycosides with both aliphatic and aromatic systems and tested their inhibitory activity towards bacterial neuraminidase.

Polysialic acids (PSAs) are naturally occurring helical, linear homopolymers composed entirely of negatively charged sialic acid residues joined by α (2,8), α (2,9), or α (2,8)/ α (2,9) alternating ketosidic linkages. They play a number of important functions in developmental biology. However, the glycosidic linkage of PSA is very labile even under mildly acidic conditions. We designed their hydrolytically stable *C*-glycoside analogues, which are ideal research targets for biological and potential pharmaceutical applications. We have synthesized *C*-linked α (2,8) Neu5Ac disaccharides, which are building blocks for the synthesis of *C*-linked oligosialic acids and polysialic acids, wherein *C*-9 of one residue is used as a hydroxymethylene bridge. We investigated various protecting function groups, through which we can stereoselectively synthesize the *C*-linked α (2,8) Neu5Ac disaccharides with only *R* configuration.