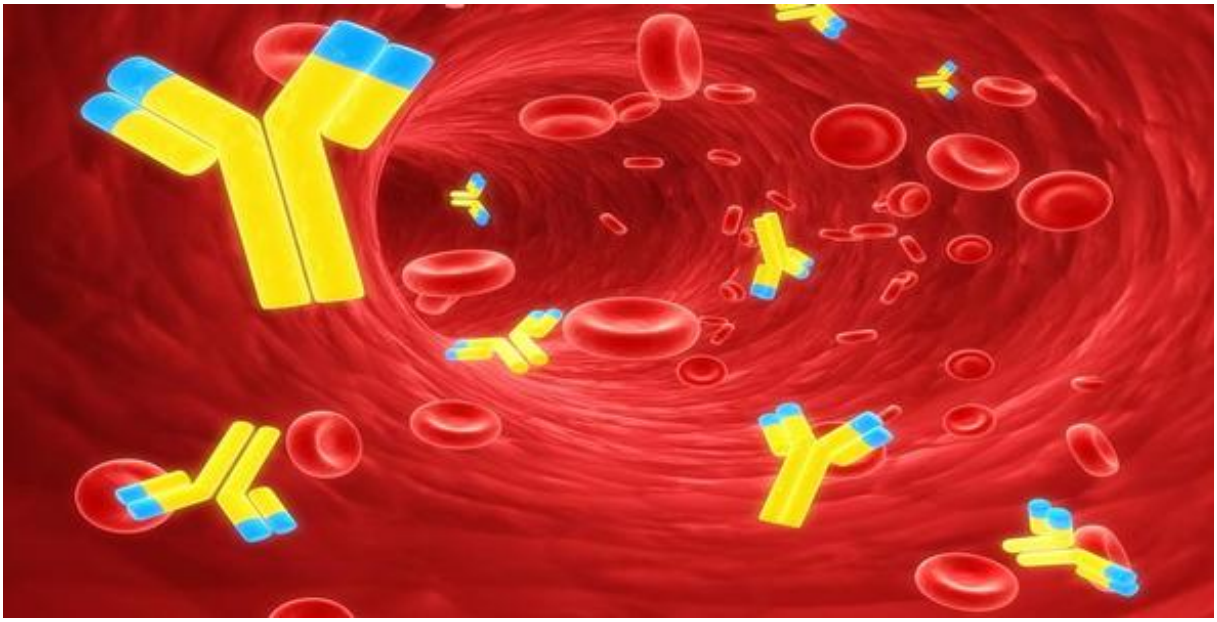
THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Antibodies/Hybridomas

Therapeutic Targets for Herpes Simplex Viral Infection and Anticoagulation



Heparan sulfates (HS) in mammalian cells play critical role in biological processes including viral infection, blood coagulation, embryonic development, and tumor growth suppression. These HSs contain particular disaccharide repeating units which are important in determining what particular proteins will bind particular HSs, thereby regulating biological processes. Currently, little is known about the process regulating biosynthesis of HSs with particular saccharide sequences. Researchers at UNC have developed methods for understanding the mechanisms for biosynthesis of biologically active HS and for understanding the relationship between different saccharide sequences and the particular biological function of HS with particular emphasis on HS D-glucosaminyl-3-*O*-sulfotransferase isoform 5 (3-OST-5).

Benefits

These methods allow for:

-the detection with antibodies and isolation of 3-OST-5 form of heparin sulfate

-testing of therapeutic applications of this particular isoform of HS

carolina blue™ opportunity

For More Information

If you would like more information about this technology or UNC - Chapel Hill's technology transfer program, please contact:

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The Technology

It is known that heparin sulfates (HS) are critical for regulating a wide variety of biological processes. HS are synthesized in the Golgi apparatus of cells. Under physiological conditions, HS polysaccharides carry a negative charge and the repeating disaccharide units include linked sulfated glucosamine and uronic acid. The specific saccharide sequence is critical in determining what proteins will bind to an HS. There are various forms of HS including HS*N*-deacetylase/*N*-sulfotransferase, 3-*O*--sulfotransferase, and 6-*O*--sulfotransferase which exist in multiple isoforms. It is thought that the different isoforms recognize saccharide sequences around their modification sites to generate the specific sulfated saccharide sequences which have different biological functions in various processes. Since knowledge is still limited with respect to the generation of these isoforms as well as their functions, this technology helps to bridge this gap in the knowledge and particularly focuses on the preparation and activity of the isoform 3-OST-5.

This technology encompasses the isolation and purification of 3-OST-5 proteins and nucleic acids from mammalian cells. Also included is the characterization of the role of 3-OST-5 in generating 3- *O*-sulfated glucosamine residues linked to sulfated uronic acid residues. Transgenic expression of this molecule in non-human animals in covered with this technology. Methods for antibody production as well as detection of 3-OST-5 polypeptide and detection as a nucleic acid molecule through hybridization is included in this technology. The technology incorporates screening substances for the capability to modulate 3-OST-5 biological activity. This technology can also be used for therapeutic methods such as gene therapy. Also included is the ability to modulate sulfate transfer to the 3-OH position of the glucosamine residue of HS in vertebrate subjects as well as the ability to modulate the production of HS in vertebrate subjects. 3-OST-5 can also be administered using a virus vector to increase the efficacy of treating disorders.

Uses for this technology include:

-Isolation and purification of a polynucleotides and polypeptides encoding HS 3-OST-5

-Antibody production against 3-OST-5 and use for detection of this protein

-Therapeutic purposes for this specific modified form of HS

Opportunity

UNC's Office of Technology Development seeks to stimulate development and commercial use of UNC-developed technologies. UNC is flexible in its agreements, and opportunities exist for joint development, academic or commercial licensing (exclusive, non-exclusive, and field-of-use), publishing, or other mutually beneficial relationships. For this technology, intellectual property has been published in the United States and is being pursued internationally.