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### Biological bases of glycans as cancer biomarkers and therapeutics

Lijuan Zhang

Ocean University of China, China

Glycans are assembled by non-template driven process and have potential chemical information orders of magnitude greater than their protein and nucleic acid counterparts. Three most common types of glycans made by all animal cells are glycosaminoglycans and N- or O-linked glycans. Cancer is a complex disease marked by uncontrollable tumor growth with prominent changes both in glycan compositions and structures in glycoproteins, proteoglycans, and glycolipids. As a result, most clinically approved circulating cancer biomarkers are either glycans or glycoproteins. One of glycan-based drugs, heparin, has been used as a major anticoagulant clinically for 79 years. At present, nine heparin-based drugs including eight types of low molecular weight heparins (LMWHs), i.e. chemically or enzymatically cleaved heparin with reduced chain length, and chemically synthesized heparin pentasaccharide fondaparinux take up over 85% of the global heparin market. Enoxaparin (lovenox), the number 3 world market-share holder of LMWHs, is the 22<sup>nd</sup> best selling drugs with an annual sale of \$3.1 billion in the US in 2007. Glycan-based drugs, blood circulating glycans, and their biological implications along with two relatively simple and reliable assays developed based on the knowledge of glycomics to identify glycan-based biomarker for cancer diagnosis will be discussed.

#### Biography

Lijuan Zhang completed her PhD from University of Alabama at Birmingham. Before that, she was a Fogarty International Fellow at NIH for three years. She worked as post-doctorate fellow and research associate at both MIT and Harvard Medical School from 1995-2002. She joined the faculty of the Department of Pathology & Immunology at Washington University in St. Louis in 2002 as a tenure-tracked Assistant Professor. She has been a Professor at Ocean University of China since 2010. Her research has been focused on the biosynthesis, structures, and biological functions of glycans since 1984 with over 60 peer reviewed articles.

[lijuanzhang@ouc.edu.cn](mailto:lijuanzhang@ouc.edu.cn)