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# Biophysics models and applications in the study of polysaccharides

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Development of physical and physico-chemical studies in biology has been generally associated to proteins and DNA, while polysaccharides interactions with cells have been less studied. However, it is now well established that a group of polysaccharides known as glycosaminoglycans (GAGs) are involved in several biological processes, including cell adhesion and signaling. GAGs, which are highly charged polyelectrolytes normally attached to proteins known as proteoglycans, are present in most human tissues. Most of the biological properties of proteoglycans are derived from the interactions of the GAG with their environment, hence the interest in developing physical models that could describe their interactions with whole cells. These biopolymers have the special characteristic of being linear, unbranched and have low polydispersity. For this reason, they can be modeled and studied using polymer physics models (i.e. worm-like chain (WLC)).

Due to their highly charged nature, even after decades of work, characteristic chain dimensions and conformations derived from the analysis of second virial coefficients, intrinsic viscosities or radii of gyration are still unknown for some of these molecules. In this talk I will introduce the basic aspects of my studies with GAGs and the strategies to develop predictive models of cell interactions with them. I will also mention my interests in the development of advanced surface GAG deposition techniques for the future development of biomimetic surfaces to study GAG-cell and GAG-protein interaction.

## Biography

Peramo currently serves as research faculty in Department of Oral and Maxillofacial Surgery of the University of Michigan, USA. Dr. Peramo completed his doctorate in Applied Physics at the University of South Florida working in applications of polymer physics and surface science related to glycosaminoglycan biology applied to cancer. At the University of Michigan he has been working in the area of biointegrative materials and tissue engineering applications in soft tissues. He has published papers in a variety of areas ranging from surface science to tissue engineering.

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