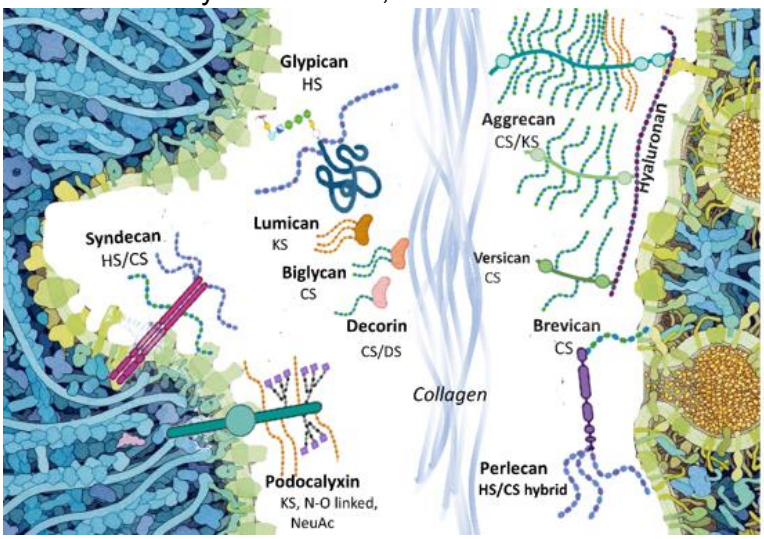
GLYCOSAMINOGLYCANS: WHAT REMAINS TO BE SOLVED?

Serge Perez

Centre de Recherche sur les Macromolecules, Végétales, University of Grenoble-Alpes, Grenoble, France
serge.perez@cermav.cnrs.fr
On behalf of all the authors cited in References 1 and 2.

Within the context of a European Cooperation in Science and Technology Action (INNOGLY), scientists of the Glycosaminoglycans (GAG) research community addressed the questions of what remains to be solved to understand the structure and function of GAGs fully and address their role in proteo-glycans (PG) and further in the glycocalyx and peri- and extra-cellular matrix.
They identified those pending issues that will benefit from the development of new approaches, namely in chemistry and biology, with emphasis on

(i) The synthesis of GAG oligosaccharides to build large and diverse GAG libraries,
(ii) GAG analysis and sequencing by mass spectrometry (*e.g.*, ion mobility-mass spectrometry), gas-phase infrared spectroscopy, recognition tunnelling nanopores,
(iii) Biophysical methods to investigate binding interfaces
(iv) Molecular modelling to identify bioactive GAG sequences and to expand our knowledge and understanding of glycocode governing GAG molecular recognition
(v) Artificial intelligence for in-depth investigation of GAGomic data sets and their integration with proteomics.
(vi) The functional characterisation of the new PGs recently identified by glycoproteomics,
(vii) The selectivity of interactions mediated by GAG chains,
(viii) The display of GAG chains and PGs at the cell surface and their impact on the availability and activity of soluble ligands and on their move through the glycocalyx layer to reach their receptors,
(ix) the human GAG profile in health and disease,
(x) the roles of GAGs and particular PGs involved in cancer, inflammation, and fibrosis.



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