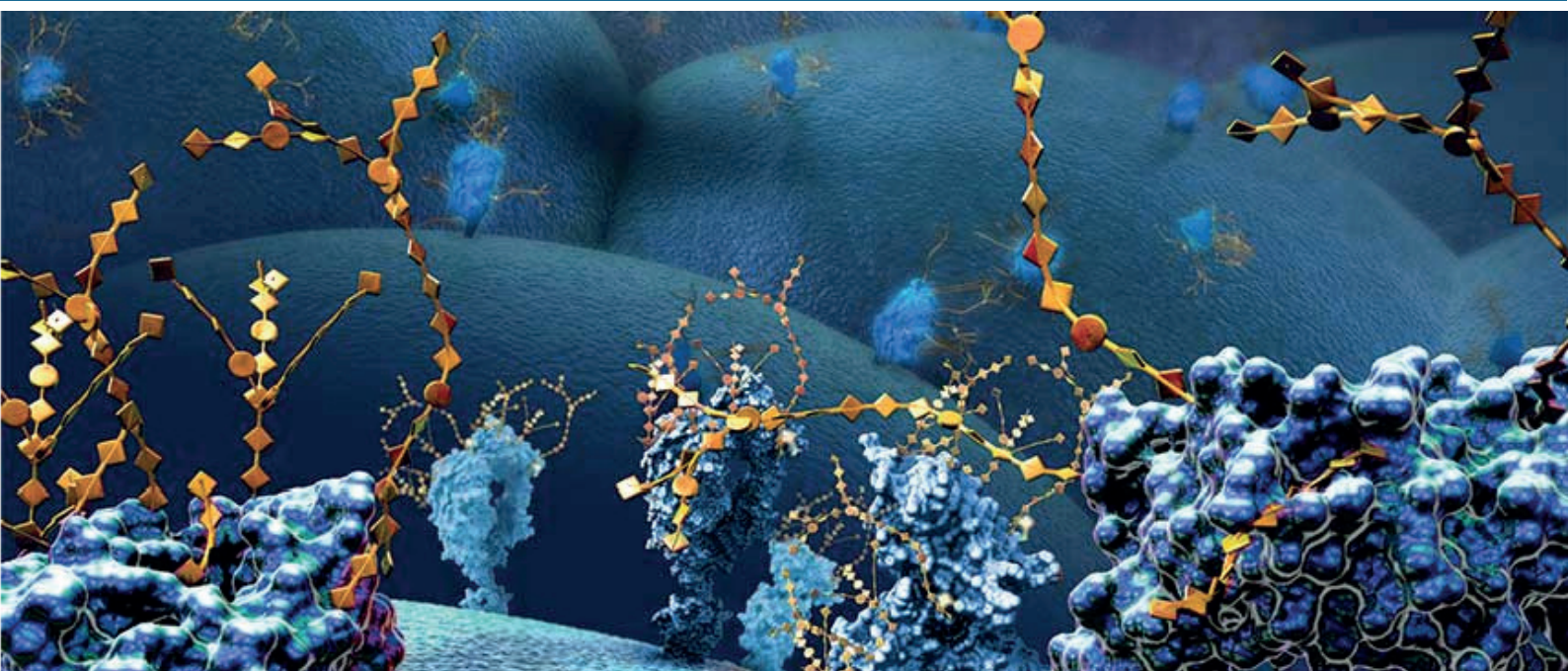


New Frontiers Symposium on Translational Glycoscience

the impact of glycoscience for future personalized medicine



Symposium sessions

- ◆ Advanced tools
- ◆ Genetics
- ◆ Infectious diseases
- ◆ Neurological diseases
- ◆ Nutrition, health & aging
- ◆ Oncology

Interactive sessions

- ◆ Guided poster sessions
- ◆ Pitch your challenge
- ◆ Scientific debate:
Future of Glycoscience

When & where

18 & 19 November 2021
Radboud Auditorium
or online
Nijmegen, the Netherlands

Glycoscience

The glycome has a major impact on every aspect of life sciences, from developmental biology to new forms of personalized diagnostics and therapy. After the genome and proteome, the glycome presents a new perspective on human biology and disease. This symposium gathers national and international leading scientists to provide a universal overview on current advances in the field of glycobiology.

Keynote speakers

- ◆ **Catherine Costello** (USA) - Deciphering the role of glycans in human disease
- ◆ **Henrik Clausen** (DK) - Genetic Glyco-engineering to dissect the role of glycans in human biology
- ◆ **Laura Kiessling** (USA) - The chemical biology of microbial glycans

Registration & programme

www.radboudumc.nl/radboudfrontiers2021
Registration deadline: 1 September 2021



**Radboud Consortium
for Glycoscience**

Institute for Molecular Life Sciences

Radboudumc

Glycosaminoglycan alterations in benign prostate hyperplasia and prostate cancer

Gábor Tóth^{1,2}, Simon Nándor Sugár¹,
Domonkos Pál^{1,2}, Kata Dorina Fügedi^{1,2}, Tibor Szarvas^{3,4}, László Drahos¹, Gitta Schlosser⁵, Ilona Kovalszky⁶, Lilla Turiák¹

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Aims

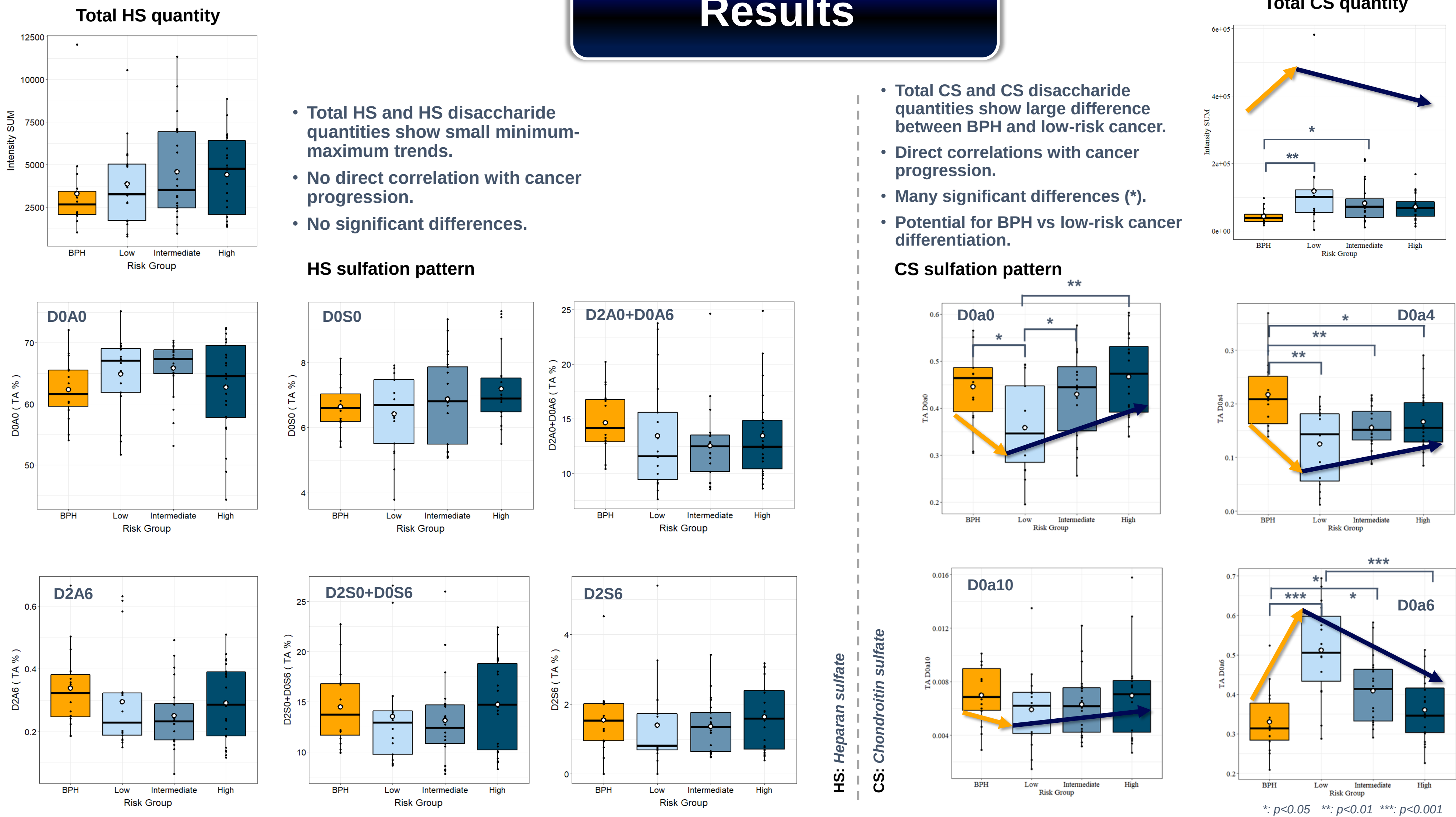
Chondroitin-sulfate and heparan-sulfate alterations in benign prostate hyperplasia and prostate cancer

Conclusion

Significant differences in CS quantity and sulfation
Overall survival can be estimated based on HS and CS disaccharide levels

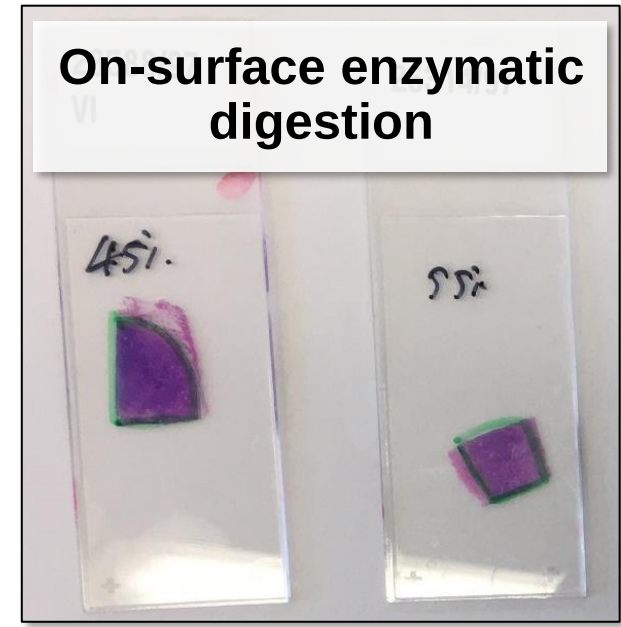
Acknowledgments
National Research, Development and Innovation Office (OTKA PD 121187 and OTKA FK 131603) and János Bolyai Research Scholarship of the Hungarian Academy of Sciences.

Results



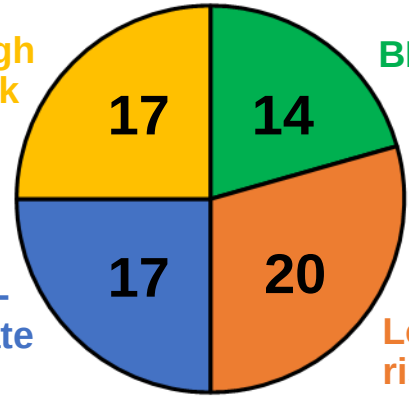
Methodology

Samples



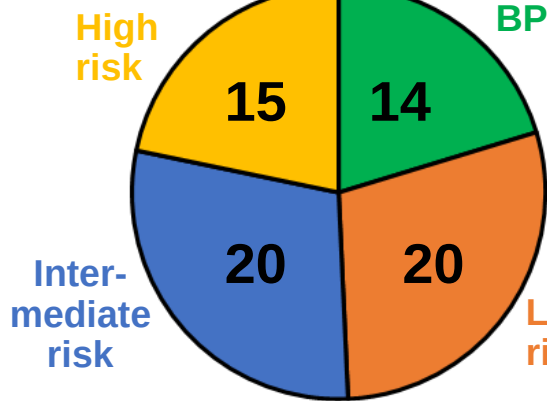
HS cohort

Risk group

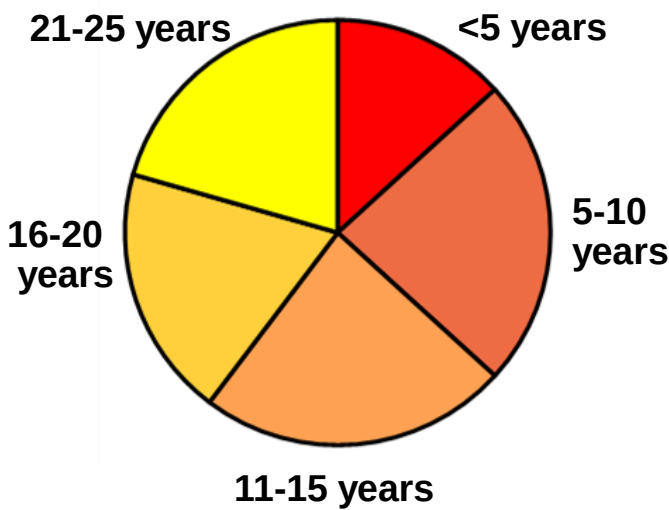


CS cohort

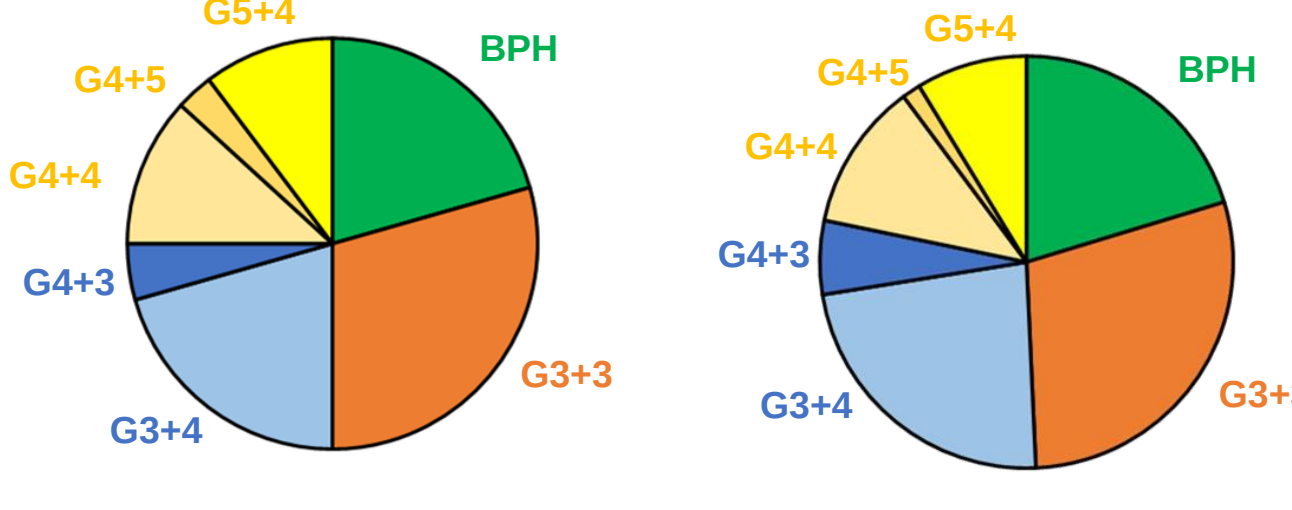
Risk group



Overall survival

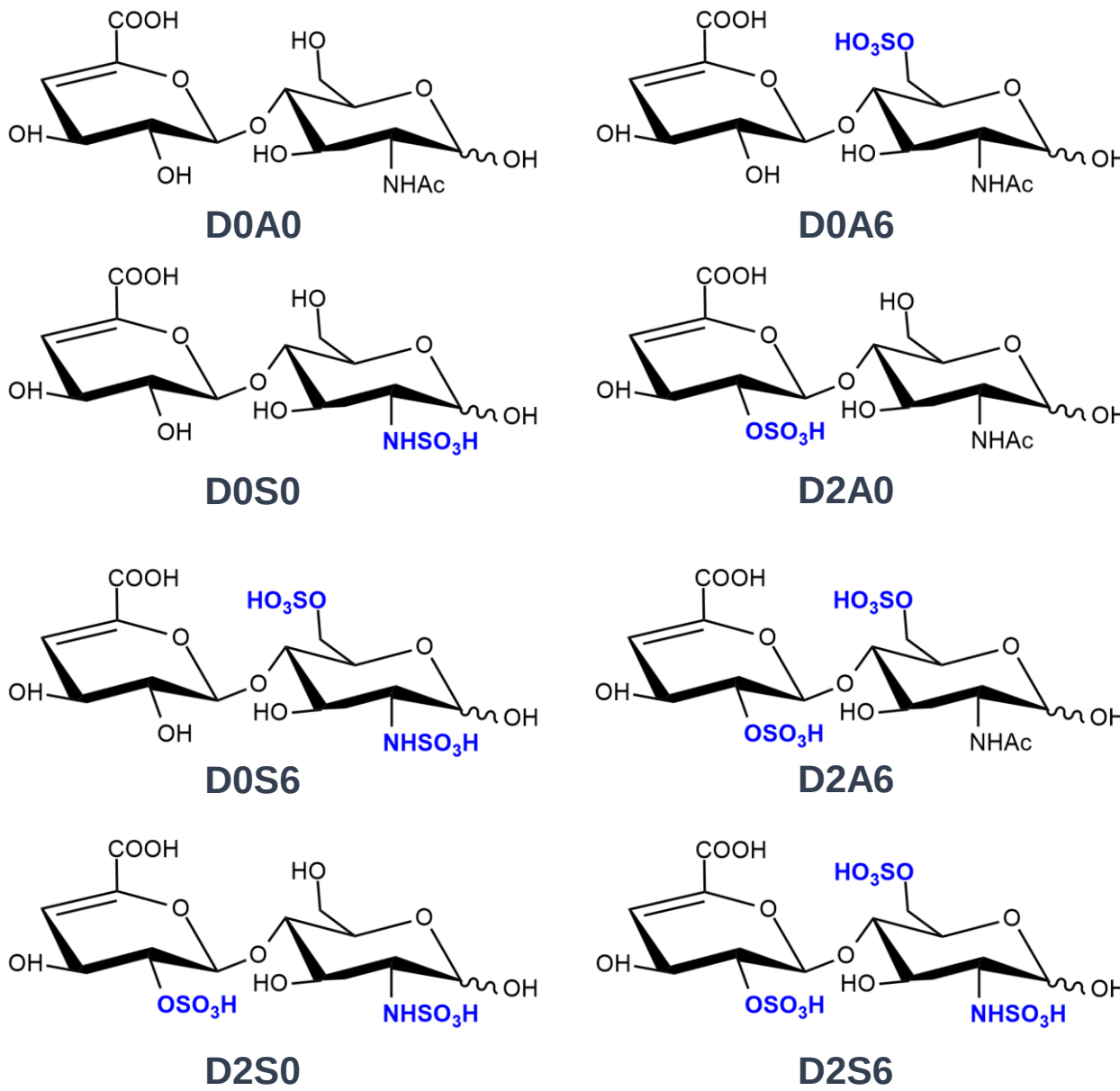


Gleason grade

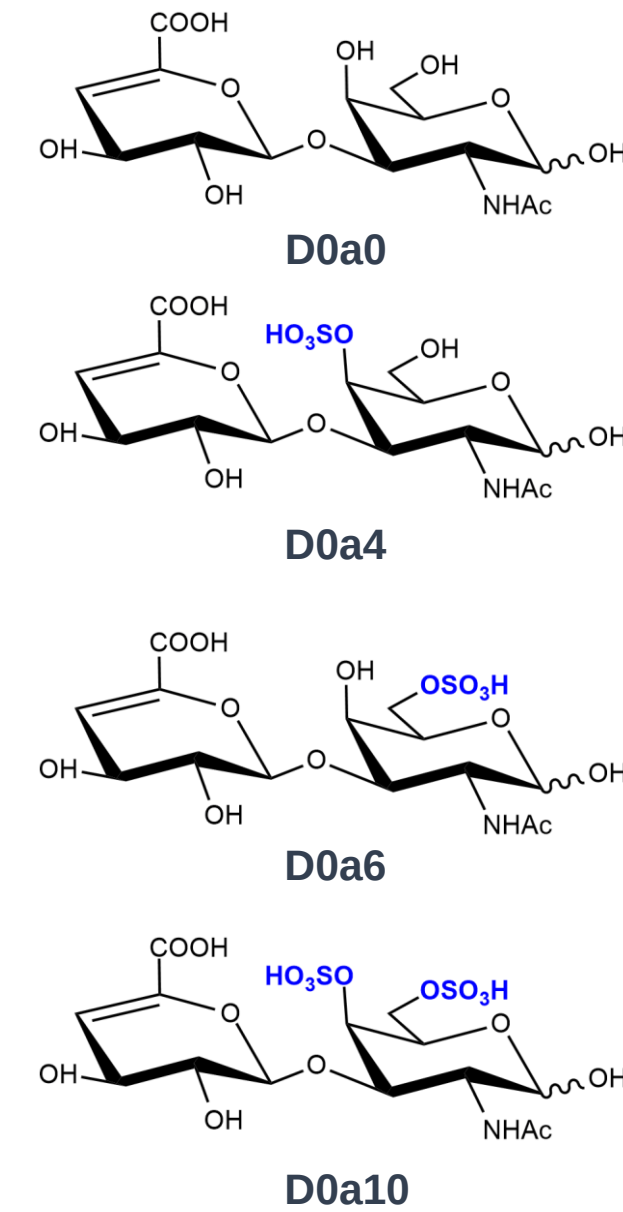


Analytes after on-surface digestion

Heparan sulfate



Chondroitin sulfate

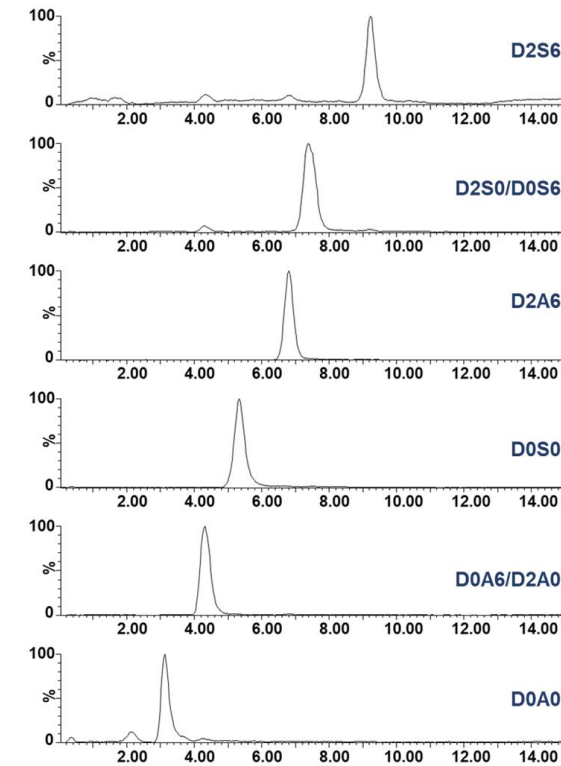


HPLC-MS analysis

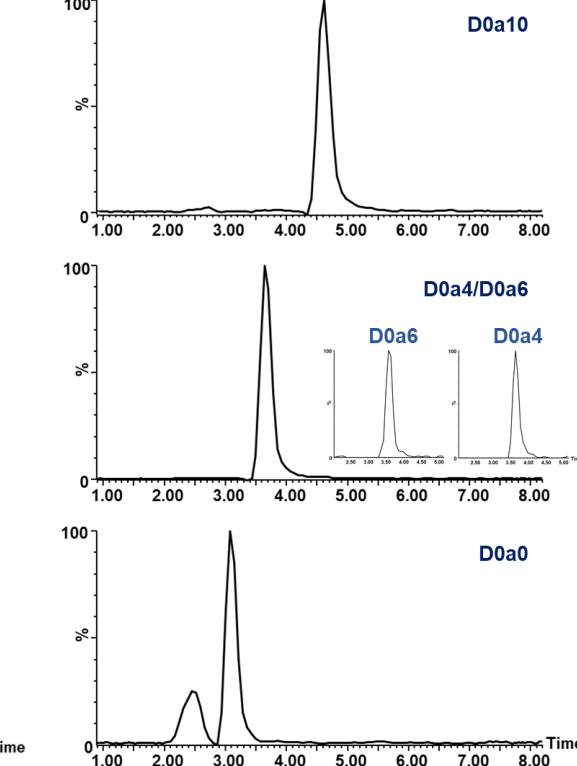


Waters I-class UPLC
Waters Select Series IMS QTOF

HS disaccharides



CS disaccharides



Kaplan-Meier plots have been generated with the tool described in Györfi, B., Computational and Structural Biotechnology Journal, 2021,19:4101-4109. Automatic cut-off between low and high levels.

Glycosaminoglycan alterations in benign prostate hyperplasia and prostate cancer

Gábor Tóth^{1,2}, Simon Nándor Sugár¹, Domonkos Pál^{1,2}, Kata Dorina Fügedi^{1,2}, Tibor Szarvas^{3,4},
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Glycosaminoglycans (GAGs) are large linear polysaccharides bearing different sulfation motifs along the chain according to their functions. They can be either in free form or attached to proteins forming proteoglycans. The quantity and sulfation of GAGs can substantially change in some diseases like cancer, however, the exact changes and the biological information they carry is still to be determined.

We have investigated the chondroitin-sulfate (CS) and heparan-sulfate (HS) content of samples originating from patients with benign prostate hyperplasia (BPH) and prostate cancer (low, intermediate and high risk groups based on Gleason grading). For the measurements, we used a HPLC-MS method previously developed [1] by our group using HILIC-WAX capillary column for separating GAG disaccharides.

Regarding HS, we found that there was no significant change either in the quantity or the sulfation pattern of the chains. CS chains, however, showed significant changes regarding both. The total quantity of CS monotonously increased from BPH through cancer progression. The non-sulfated disaccharide building blocks showed a significant decrease in relative amount with cancer progression. The singly sulfated components exerted an interesting shift: while the relative abundance of Δ UA-GalNAc4S decreased monotonously from BPH to high risk prostate cancer,

the opposite could be observed for Δ UA-GalNAc6S. Furthermore, Δ UA-GalNAc6S disaccharide changed significantly between BPH and all the different severity groups of prostate cancer. Our findings provide a good basis for future potential chondroitin-sulfate-based classification of prostate malfunctions.

Acknowledgments

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References

Gábor Tóth, et al. Salt and solvent effects in the microscale chromatographic separation of heparan sulfate disaccharides, J. Chrom A, 1610, 2020, 460548.