

30th Symposium on Glycosaminoglycans

September 21st – 23rd, 2023



Organizers:

Marco Guerrini and Antonella Bisio

Istituto di Ricerche Chimiche e Biochimiche "G. Ronzoni", Milan
Italy

Gerd Bendas and Martin Götte

University of Bonn University of Münster
Germany

Welcome back to Villa Vigoni 2023!

The 30th edition of this annual series of symposia sees the return to its original venue. As always, eminent specialists from all over the world are invited to discuss both current and emerging topics of interest in the fields of chemistry, biochemistry, biology, pharmacology, and in the clinical applications of heparin and other glycosaminoglycans. In particular, sessions devoted to the role of glycosaminoglycans in viral infections and in malignancy, or to heparanase inhibitors as well as to the advances in analytical approaches, have been considered. The subjects of interest cover biosynthesis, structural characterization and protein interactions, biological functions, pharmaceutical and clinical aspects including anti-inflammatory and anti-tumor activity. For the first time, a poster session is also planned aimed to young researchers.

The symposium will have a hybrid character, allowing both in-presence and virtual participation. However, as per tradition, participation is only by invitation. A sufficient time will be allotted for in-depth discussion. The informal, workshop-like character of the symposium and the pleasant surroundings of the Villa traditionally stimulate after-session interactions among participants as in the past 29 editions.

Marco, Antonella, Gerd and Martin

Honorary Board

Job Harenberg and Giangiacomo Torri

Scientific Board

Annamaria Naggi, Marco Guerrini, Antonella Bisio, Roland Krämer, Gerd Bendas, Martin Götte, Susanne Alban, Kay Grobe, Jawed Fareed, Ram Sasisekharan.

Scientific Secretary

Antonella Bisio

Thursday, September 21st 2023

13.30 – 14.30 **Lunch**

15.00 – 15.10 **Welcome address: Job Harenberg**

STRATEGIC ASPECTS OF GAGs AND GAG MIMETICS

Moderator: **Marco Guerrini**

15.10 – 15.30 **Jeffrey Esko**, San Diego
Our Heparanomes and the Human Condition.

15.30 – 15.50 **Ram Sasisekharan**, Cambridge
The Approval Processes for New Drugs Following the Pandemic.

15.50 – 16.10 **Kang Chen**, Silver Spring
NMR as a Multi-Attribute Method in Complex Drug Analysis: Pentosan Polysulfate Sodium.

16.10 – 16.30 **Susanne Alban**, Kiel
Chemical and Biological Differences Between Original and Mimetic Pentosan Polysulfates.

16.30 – 16.50 **Discussion**

16.50 – 17.10 **Coffee and tea**

GLYCOSAMINOGLYCAN ACTIVITIES IN MALIGNANCY (I)

Moderator: **John Gallagher**

17.10 – 17.30 **Mattias Belting**, Lund
Extracellular Vesicle Uptake in the Stressed Tumor Niche: Opposite Roles for Heparan and Chondroitin Sulfate Proteoglycans.

17.30 – 17.50 **Giuliana Cassinelli**, Milan
Multitasking Antitumor Activities of Heparins in Sarcoma.

17.50 – 18.10 **Gerd Bendas**, Bonn
Beyond HSPG Synthesis - Exostosin-1 Affects Chemosensitivity as a Tumor Suppressor in Melanoma Cells.

18:10 – 18:30 **Discussion**

19.30 **Welcome cocktail**

20.00 **Dinner**

GLYCOSAMINOGLYCANS AND VIRAL INFECTION

Moderator: **Kay Grobe**

- 9.00 – 9.20 **Ed Yates**, Liverpool
Heparin in Viral Infections; Challenges and Opportunities.
- 9.20 – 9.40 **Jin-ping Li**, Uppsala
Heparan Sulfate Mimetics inhibit SARS-CoV-2.
- 9.40 – 10.00 **Jurij Froese**, Münster
SARS-CoV-2 Receptor Binding to Heparin and its Evolutionary Optimization.
- 10.00 – 10.20 **Discussion**
- 10.20 – 10.40 **Coffee and tea**

GAGs AS TREATMENTS AND DIAGNOSTICS IN HUMAN DISEASE (I)

Moderator: **Barbara Mulloy**

- 10.40 – 11.00 **Clive Page**, London
Heparin and Related Compounds as Treatments in Respiratory Diseases.
- 11.00 – 11.20 **Erik Holmer, Lena D. Wikingsson, Gunvor Ekman-Ordeberg**, Stockholm
Tafoxiparin: a Drug Candidate for Labor Priming. Properties and Clinical Results.
- 11.20 – 11.40 **Xiao Zhang**, Uppsala
Non-Anticoagulant Heparin in Obstetrics – a Dual-Acting Promoter of Oxytocin Signaling.
- 11.40 – 12.00 **Vito Ferro**, Brisbane
Small Molecule Approaches for the Treatment of MPS III (Sanfilippo Syndrome).
- 12.00 – 12.20 **Discussion**
- 13.00 – 14.00 **Lunch**

HEPARANASE AND ITS INHIBITORS IN HEALTH AND DISEASE

Moderator: **Martin Götte**

- 14.20 – 14.40 **Israel Vlodavsky**, Haifa
The Heparanase/Heparanase-2 Regulatory Network in Health and Disease.
- 14.40 – 15.00 **Liang Wu**, Didcot
Structure Guided Design for Inhibitors of Heparanase and Other Enzymes.
- 15.00 – 15.20 **Stefano Elli**, Milano
Molecular Aspects of Heparanase Interaction with Heparan Sulfate Mimetics.
- 15.20 – 15.40 **Discussion**

15.40 – 17.00

POSTER SESSION
with coffee and tea

GAGs AS TREATMENTS AND DIAGNOSTICS IN HUMAN DISEASE (II)

Moderator: **Roland Krämer**

- 17:00 – 17.20 **Jawed Fareed, Bulent Kantarcioglu, Walter Jeske**, Chicago
Endogenous Glycosaminoglycans in Various Pathologic Disorders.
- 17.20 – 17.40 **Francesco Gatto**, Stokholm
Noninvasive Glycosaminoglycan Profiling (GAGomes) for Multi-Cancer Early Detection: Update from Single-Cancer Studies.
- 17:40 – 18:00 **Jian Liu**, Chapel Hill
Neutralizing Extracellular Histone and HMGB1 by Heparan Sulfate Octadecasaccharide (18-mer) Protects Against Sepsis.
- 18.00 – 18.20 **Discussion**
- 20.00 **Dinner**

HEPARAN SULFATE AND MIMETICS: STRUCTURE AND ANALYSIS

Moderator: **Annamaria Naggi**

- 9.00 – 9.20 **Ravi Krishnan**, Melbourne
Pentosan Polysulfate Sodium, a Glycosaminoglycan Mimetic with Multiple Mechanisms of Actions Supporting the Treatment of Acute and Chronic Diseases.
- 9.20 – 9.40 **Mark Skidmore**, Keele
New Applications for Extant Technologies in the Analysis of Glycosaminoglycans.
- 9.40 – 10.00 **Courtney Mycroft-West**, Didcot
Structural and Mechanistic Characterization of Bifunctional Heparan Sulphate N-Deacetylase-N-Sulfotransferase.
- 10:00 – 10:20 **Discussion**
- 10:20 – 10.40 **Coffee and tea**

GLYCOSAMINOGLYCAN ACTIVITIES IN MALIGNANCY (II)

Moderator: **Elaine Gray**

- 10:40 – 11.00 **Nancy Espinoza Sanchez**, Münster
Role of the Heparan Sulfate Proteoglycan Syndecan-1 in Radioresistance of Breast Cancer.
- 11.00 – 11.20 **Laura Alaniz**, Buenos Aires
Sulfated Hyaluronan Modulates Immunity and Angiogenesis in the Tumor Microenvironment.
- 11.20 – 11.40 **Michail Karamouzis**, Athens
Anti-Neoplastic Properties of Tinzaparin. From Laboratory to the Clinical Field.
- 11.40 – 12.00 **General discussion**
- 12:00 – 12:10 **Closing remarks: Giangiacomo Torri**
- 13.00 – 14.00 **Lunch**

POSTERS

- **Taran Kandola**, Keele
Altered Substrate Specificity with Regard to β -Eggherti Heparin Lyase 1
- **Marco Mandalari**, Milan
Characterization of the Interaction between the S1–Spike Protein of SARS-CoV-2 Variants and Heparan Sulfate – Pentosan Polysulfate Oligosaccharides Using in Silico Models
- **Lucy Naughton**, Keele
Structure-Function Relationships Between PF4 and HS/Heparin
- **Katrin Nekipelov**, Bonn
Use of Synthetic Heparin Mimetics to Target the Immunosuppressive Activities of Platelets
- **Jessica Onyeisi**, Münster
The role of Syndecan-4 in Breast Cancer Pathogenesis
- **Michela Parafioriti**, Milan
NMR and Molecular Modelling for Understanding Glycosaminoglycan Recognition by Proteins.
- **Eduardo Stancanelli**, Chapel Hill
A New Solid-Phase Method for the Chemoenzymatic Synthesis of Heparan Sulfate and Chondroitin Sulfate
- **Yongmei Xu**, Chapel Hill
Chemoenzymatic Synthesis of Heparin Oligosaccharides with both Anti-Factor Xa and Anti-Factor IIa Activities

Location of the Symposium

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