



31st Symposium on Glycosaminoglycans

September 19th – 21st, 2024



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 to Villa Vigoni 2024!

The series of these traditional symposia continues in the prestigious venue of Villa Vigoni. As per tradition, distinguished 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 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. As for the previous year, 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 30 editions.

Marco, Antonella, Gerd and Martin

Honorary Member

Job Harenberg

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 19th 2024

13.00 – 14.30 **Lunch**

15.00 – 15.10 **Welcome address: Gerd Bendas**

GLYCOSAMINOGLYCANS AND BIOSYNTHETIC ASPECTS

Moderator: **Ulf Lindahl**

15.10 – 15.30 **Lena Kjellén**, Uppsala
N-Sulfation in Heparin/Heparan Sulfate Biosynthesis.

15.30 – 15.50 **Courtney Mycroft-West**, Didcot
Investigating Heparan Sulfate Biosynthesis in Situ.

15.50 – 16.10 **Christian Gorzelanny**, Hamburg
Mechanistic Link between Heparan Sulfate Biosynthesis and Tumor progression.

16.10 – 16.30 **Discussion**

16.30 – 16.50 **Coffee and tea**

PERSPECTIVES IN PROTEOGLYCAN AND GAG RESEARCH

Moderator: **Marco Guerrini**

16.50 – 17.10 **Renato Iozzo**, Philadelphia
Proteoglycan Suppression of Tumor Lymphangiogenesis: A Mechanism to Curtail Cancer Progression.

17.10 – 17.30 **Jawed Fareed**, Chicago
Recent Development in Glycosaminoglycan Research. A Personal Perspective with a Focus on Italian and German Collaboration with Loyola.

17.30 – 17.50 **Job Harenberg**, Heidelberg
From Glycosaminoglycans to Direct Oral Anticoagulants - Methods for Determination in Urine.

17:50 – 18:10 **Discussion**

19.00 **Cocktail and Dinner**

GAGs, GAG MIMETICS AND PROTEIN INTERACTIONS

Moderator: **Mark Skidmore**

- 9.00 – 9.20 **Kay Grobe**, Münster
Evolution of the SARS-CoV-2 Spike Protein towards Optimized Heparan Sulfate Cross-Linking and Inter-Chain Mobility.
- 9.20 – 9.40 **Ralf Richter**, Leeds
Revealing Complexity of Glycosaminoglycan/Effector Protein Interactions in the Extracellular Space – Tools and Insights.
- 9.40 – 10.00 **Pedro Nieto**, Madrid
NMR Studies on the Interactions between CS Mimetics and Midkine and Pleiotrophin.
- 10.00 – 10.20 **Susanne Alban**, Kiel
Interactions of PPS Originals and Mimetics with the Contact and Complement System.
- 10.20 – 10.40 **Discussion**
- 10.40 – 11.00 **Coffee and tea**

GLYCOSAMINOGLYCAN IN HEALTH AND HUMAN DISEASE

Moderator: **Annamaria Naggi**

- 11.00 – 11.20 **Marcelo Lima**, Keele
Anti-inflammatory Properties of Heparin Byproducts.
- 11.20 – 11.40 **Rolland Reinbold**, Milan
Single Cell Sequencing and Glycobiology: Providing Insight into the Role of Glycoconjugates in Aging, Cancer and Autoimmunity.
- 11.40 – 12.00 **Ana Magalhães**, Lisbon
Heparan and Chondroitin Sulfate Proteoglycans Cellular Balance and Functional Implications for Gastric Cancer Progression.
- 12.00 – 12.20 **Discussion**
- 13.00 – 14.00 **Lunch**

HEPARANASE AND ITS INHIBITORS

Moderator: **Jin-ping Li**

- 14.20 – 14.40 **Israel Vlodavsky**, Haifa
Heparanase-2 (Hpa2) - a Protective Protein in Cancer and Inflammation.
- 14.40 – 15.00 **Stephan Brezillon**, Reims
Analysis of Heparanase-1 Expression and Activity in Small Extracellular Vesicles of Ovarian Cancer Cells by a Multidisciplinary Approach.
- 15.00 – 15.20 **Nancy Espinoza-Sanchez**, Münster
Role of Syndecan-1 and Heparanase in the Lateral Transmission of Aggressiveness in Breast Cancer.
- 15.20 – 15.50 **Discussion**

15.50 – 17.10

POSTER SESSION
with coffee and tea

ENZYMES AND INHIBITORS

Moderator: **Martin Götte**

- 17.10 – 17.30 **Geert-Jan Boons**, Utrecht
Synthetic Heparanase Inhibitors Can Prevent Herpes Simplex Viral Spread.
- 17.30 – 17.50 **Hien Nguyen**, Detroit
Repurposing Aminoglycosides as Potent Heparanase Inhibitors to Study Tumor Growth and Metastasis.
- 17.50 – 18.10 **Romain Vivès**, Grenoble
Sulfs Unmasked: A Deep Dive into the Structural Complexity of an Elusive Enzyme.
- 18.10 – 18.30 **Discussion**
- 19.30 **Dinner**

NEW ANALYTICAL AND APPLICATION STRATEGIES

Moderator: **Roland Krämer**

- 9.00 – 9.20 **Rebecca Miller**, Copenhagen
Cell-Based Libraries of Glycosaminoglycans – New Technology and Tools.
- 9.20 – 9.40 **Kevin Pagel**, Berlin
Mass Spectrometry-Based Techniques for Glycosaminoglycan.
- 9.40 – 10.00 **Sofia Nizzolo**, Milan
Encapsulation of Glycosaminoglycans in Lipid Nanoparticles.
- 10:00 – 10:20 **Discussion**

REGULATORY ASPECTS

Moderator: **Tim Rudd**

- 10.20 – 10.40 **Elaine Gray**, London
Regulatory and Pharmacopoeial Approaches to Diversification of Animal Sources of Heparin.
- 10.40 – 10.50 **Discussion**
- 10:50 – 11.10 **Coffee and tea**

GLYCOSAMINOGLYCAN IN HEALTH AND HUMAN DISEASE (II)

Moderator: **John Gallagher**

- 11.10 – 11.30 **Gerd Bendas**, Bonn
Insights into Immuno-Oncological Activities of Heparin and Heparin Mimetics.
- 11.30 – 11.50 **Karin Forsberg Nilsson**, Uppsala
Proteoglycan Remodelling in the Brain Tumor Microenvironment.
- 11.50 – 12.10 **Jerry Turnbull**, Keele
Modulation of Neural and Mesenchymal Stem Cell Behaviour by Selectively Modified Heparins.
- 12.10 – 12.30 **General discussion**
- 12:30 – 12:40 **Closing remarks: Antonella Bisio**
- 13.00 – 14.00 **Lunch**

POSTERS

- **Taran Kandola**, Keele
Anti-Inflammatory Properties of Heparin Byproducts.
- **Marco Mandalari**, Milan
Molecular Interaction between Mimetics of Heparan Sulfate and the Recognition Spike Protein of SARS-CoV-2 Virus.
- **Lucy Naughton**, Keele
Structure Function Relationships between Heparin and PF4 in Heparin Induced Thrombocytopenia.
- **Daniel Orlov**, Münster
Interplay of Syndecan-1 and Heparanase-2 in Breast Cancer Pathogenesis.
- **Marie Schulz-Fincke**, Bonn
Epigenetic Targeting of Heparan Sulfate 3-O and 6-O Sulfotransferases in Breast Cancer Cells: Prospects for Attenuating Prothrombotic Tumor Cell Activities.
- **Yuanyuan Wang**, Hamburg
Heparan Sulfate on Extracellular Vesicles Contributes to Cancer Associated Thrombosis.

Location of the Symposium

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