



Scientific Program

20th Symposium on Glycosaminoglycans

New developments of anticoagulant and non-anticoagulant glycosaminoglycans and of other coagulation inhibitors

September 20th – 22nd, 2012

Organizers:

Job Harenberg

Clinical Pharmacology, Faculty of Medicine
Mannheim

Benito Casu

„G. Ronzoni“ Institute for Chemical and Biochemical Research,
Milan

Welcome to Villa Vigoni 2012

As for the past nineteen editions, the 20th Glycosaminoglycan Symposium will take place in Villa Vigoni (Lovenno, Lake Como). Started as Italian-German meetings (the villa is owned by the German Government), the symposia have become more and more international, with eminent specialists from all over the world invited to contribute to discussion of topics of actual or emerging interest in the field of chemistry, biochemistry, biology, pharmacology, and clinical applications of heparin and other glycosaminoglycans. Both basic and applied aspects will be covered and discussed, with about twenty percent of participants being associated with industrial companies. Participation in the symposium (only by invitation) is limited to a maximum of 70 participants.

This year, the topics selected for discussions include: approaches to establish structure-activity relationships with special emphasis on inflammation and cancer, low- and ultra-low molecular weight heparins and heparin oligosaccharides, enzymes for biosynthetic editing of, and analytical tools for, glycosaminoglycans, biotechnological heparins and heparan sulfates, proteoglycans in health and disease, and clinical pharmacology assessment of heparins and non-GAG antithrombotic agents.

Keynote speakers will outline the state-of-the art in each field and present novel results. A sufficient time will be allotted to in-depth discussion. The informal, workshop-like character of the symposia and the pleasant surroundings of the villa traditionally stimulate also after-session interactions among participants.

Job Harenberg

job.harenberg@medma.uni-heidelberg.de

Benito Casu

casu@ronzoni.it

Main topics

Anticoagulants

Glycosaminoglycans, heparins, low- and very low- molecular-weight heparins, synthetic pentasaccharides, new antithrombotic drugs, thrombin inhibitors

Characterization of glycosaminoglycans

Anticoagulant assays, nuclear magnetic resonance, mass spectrometry, capillary electrophoresis, new enzymatic approaches, new biological assays, heparin contaminants, standardization and harmonization of methods

Structure-function relationships

Interactions with growth factors, heparanase, and other proteins overexpressed in inflammation and cancer.

Clinical studies

Deep venous thrombosis and pulmonary embolism, glycosaminoglycans, ischemic stroke, myocardial infarction, new indications, prolonged prophylaxis of venous thromboembolism, pentasaccharides, thrombin inhibitors, low-molecular weight heparins and cancer.

Scientific board

B. Casu, J. Harenberg, R. Sasisekharan, G. Torri

Thursday, September 20th, 2012

14.30-14.40 J. Harenberg , Mannheim and B.Casu, Milan: Welcome address

INVITED INTRODUCTORY LECTURE

14.40-15.10 **J. Fareed**, Chicago
History of the Glycosaminoglycan Symposia in the scientific context

GLYCOSAMINOGLYCAN-PROTEIN INTERACTIONS

Moderators: **J. Gallagher**, **R. Sasisekharan**

15.10-15.30 **J. Liu**, Chapel Hill, NC
Uncovering the control for the enzymatic synthesis of heparin and heparan sulfate

15.30-15.50 **U. Lindahl**, Uppsala
Heparin and wound healing

15.50-16.10 **J. Turnbull**, Liverpool
Synthesis of a targeted library of HS hexa- to dodecasaccharides as inhibitors of β -secretase, potential therapeutics for Alzheimer's disease

16.20-16.40 **Discussion**

16.40-17.00 Coffee and tea

17.00-17.20 **R. Sasisekharan**, Boston
Perspectives on glycosaminoglycan-protein interactions

17.20-17.40 **C. Viskov**, Paris
Unusual sequences in antithrombin-binding fragments

17.40-18.00 **K. Sugahara**, Sapporo
Glycosaminoglycan signals involved in the pulmonary metastasis of tumor cells

18.00-18.20 **Discussion**

Friday, September 21st 2012, morning

**MOLECULAR BASIS FOR BIOLOGICAL ACTIVITIES
OF HEPARIN AND OTHER GLYCOSAMINOGLYCANS**

Moderators: **U. Lindahl, R.D. Sanderson**

- 9.00-9.20** **S. Schneider**, Mannheim
Inhibition of melanoma metastasis in mice by LMWH
- 9.20-9.40** **G. Bendas**, Bonn
Heparin interference with adhesion receptor signalling pathways
- 9.40-10.00** **L. Borsig**, Zurich
Heparin as an inhibitor of metastatic colonization
- 10.00-10.20** **M. Götte**, Münster
Role of cell surface heparan sulfate in breast cancer metastasis
- 10.20-10.40** **Discussion**
- 10.40-11.00** **Coffee and tea**
- 11.00-11.20** **J.-P. Li**, Uppsala
Heparan sulfate in amyloidosis: good or bad?
- 11.20-11.40** **I. Vlodaysky**, Haifa
Rational design of heparanase inhibitors
- 11.40-12.00** **P. Barbieri**, Mendrisio, Switzerland
Clinical “proof of concept” plans in hematological malignancies of the new heparanase inhibitor SST0001
- 12.00-12.20** **Discussion**

Friday, September 21st 2012, afternoon

GLYCOSAMINOGLYCANS IN CANCER

Moderators: **A. Stemberger, E.A. Yates**

- 14.30-14.50** **R.D. Sanderson**, Birmingham, Ala
Novel mechanisms of heparanase regulation of the tumor microenvironment
- 14.50-15.10** **M. Schlesinger**, Bonn
Lysophosphatidylcholine inhibits melanoma cell adhesion and migration via affecting Syndecan-4
- 15.10-15.30** **V. Laux**, Wuppertal
Beyond Factor Xa and Factor IIa Inhibitors: Is there room for novel antithrombotics?
- 15.30-15.50** **Discussion**
- 15.50-16.10** **Tea, Coffee**

**ADVANCED METHODS FOR STRUCTURAL ANALYSIS
AND DIAGNOSTIC APPLICATIONS OF GLYCOSAMINOGLYCANS**

Moderators: **C. Kirchmaier, G. Torri**

- 16.10-16.30** **A. Parra**, Bologna
Heparan sulfate from human cartilage
- 16.30-16.50** **G. Torri**, Milan
Profiling oligosaccharide components of low-molecular weight heparins
- 16.50-17.10** **R. Krämer**, Heidelberg
Fluorescent assay for different glycosaminoglycans
- 17.10-17.30** **E.A. Yates**, Liverpool
High sensitivity detection of contaminants in heparin
- 17.30-17.50** **M. Hricovini**, Bratislava
Theoretical analysis of sulfated oligosaccharides. The influence of counter-ions upon 3D structure and NMR parameters
- 17.50-18.10** **E. Vismara**, Milan
Iron oxide nanoparticles heparin hybrid systems: a new approach to theranostic nanoparticles
- 18.10-18.30** **Discussion**

Saturday, September 22nd 2012, morning

**HEPARINS, LOW-MOLECULAR WEIGHT HEPARINS,
BIOTECHNOLOGICAL HEPARINS, AND OTHER
GLYCOSAMINOGLYCANS**

Moderators: S. Alban, E. Gray

9.00-9.20

B. Mulloy, Potters Bar

A proposed new calibrant for molecular weight measurements of unfractionated heparin

9.20-9.40

L. Liverani, Modena

Relationship between structure and coagulation parameters of unfractionated heparins

9.40-10.00

P. Seeberger, Berlin

Automated synthesis of glycosaminoglycans as basis for chemical glycomics

10.00-10.20

Discussion

10.20-10-40

Coffee, tea

**PAST AND FUTURE FOR HEPARINS, LOW-MOLECULAR WEIGHT
HEPARINS, BIOTECHNOLOGICAL HEPARINS
AND OTHER GLYCOSAMINOGLYCANS**

Moderator: J. Harenberg

10.40-11.10

J. Mardiguian, Paris

The discovery and development of enoxaparin as the most successful low molecular weight heparin

11.10-11.40

J. Fareed, Chicago

Non-anticoagulant activities of glycosaminoglycans: a promise for the future clinical applications.

11.40-12.00

Discussion

Closing remarks: B. Casu / J. Harenberg

General Information

Thursday, September 20th, 2012

13.00 -14.00: Lunch in Villa Vigoni
19.00: Dinner in Villa Vigoni

Friday, September 21st, 2012

8.00 - 9.00: Breakfast
13.00 -14.00: Lunch in Villa Vigoni
19.00: Dinner in Villa Vigoni

Saturday, September 22nd, 2012

8.00 - 9.00: Breakfast
12.30 - 13.30: Lunch in Villa Vigoni

Location of the Symposium:

"Villa Vigoni e.V."
Via Giulio Vigoni 1
Lovenno di Menaggio
I-22017 Menaggio (Como)

Tel.: +39-0344/361232
Fax: +39-0344/361247
E-mail: reception@villavigoni.it
Internet: www.villavigoni.eu

Organisers:

Prof. Dr. B. Casu
Istituto di Ricerche Chimiche
e Biochimiche "G. Ronzoni"

Via G. Colombo, 81
I-20133 Milano
Italy
Tel: +39/02-70 641 623
Fax: +39/02-70 641 634
E-mail: casu@ronzoni.it

Prof. Dr. J. Harenberg
Clinical Pharmacology
Medical Faculty Mannheim
University of Heidelberg
Maybachstrasse 14
D-68169 Mannheim
Germany

Tel: +49/621-383 9623
Fax: +49/621-383 9622
E-mail: Job.Harenberg@medma.uni-heidelberg.de
Harenberg-j@t-online.de

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