



## **Scientific PROGRAM**

# **19<sup>th</sup> Symposium on Glycosaminoglycans**

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

**September 22<sup>nd</sup> - 24<sup>th</sup>, 2011**

### **Organizers:**

#### **Job Harenberg**

Clinical Pharmacology, Faculty of Medicine  
Mannheim

#### **Benito Casu**

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

Welcome to Villa Vigoni 2011

As for the past eighteen editions, the 19<sup>th</sup> 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.

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## **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, G. Torri, R. Sasisekharan

**Thursday, September 22<sup>nd</sup>, 2011, afternoon**

14.30-14.50 J. Harenberg , Mannheim and B. Casu, Milan: Welcome address

*Introductory Lecture:*

14.50-15.10 **U. Lindahl**, Uppsala  
Role of heparanase in regulation of appetite/energy metabolism

15.10-15.20 **Discussion**

**GLYCOSAMINOGLYCAN-PROTEIN INTERACTIONS**

Moderators: J. Gallagher, J. Turnbull

15.20-15.40 **J. Turnbull**, Liverpool  
Differential sulfation of heparan sulfate in neural cells: implications for cell transplantation

15.40-16.00 **J. Liu**, Chapel Hill, NC  
Chemoenzymatic design of heparin

16.00-16.20 **A.J. Kungl**, Graz  
Mutant proteins targeting GAG/proteoglycan structures and activities  
(*tentative title*)

16.20-16.40 **Discussion**

16.40-17.00 Coffee and tea

*Special Lecture*

17.10-17.30 **R. Sasisekharan**, Cambridge  
Perspectives on glycan-protein interactions

17.30-18.00 **Discussion**

**Friday, September 23<sup>rd</sup> 2011, morning**

**PROTEOGLYCANS AND GLYCOSAMINOGLYCANS  
IN HEALTH AND DISEASE**

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

- 9.00-9.20** **G. Bendas**, Bonn  
Heparin interference with adhesion receptor signalling pathways
- 9.20-9.40** **A. Bisio**, Milan  
Characterization of heparan sulfate from growth plate cartilage
- 9.40-10.00** **L. Borsig**, Zurich  
Initiation of metastatic microenvironment and the inhibitory potential of heparin
- 10.00-10.20** **Discussion**
- 10.20-10.40** **Coffee and tea**
- 10.40-11.00** **M. Götte**, Münster  
Functional interplay of heparan sulfate and dermatan sulfate proteoglycans in allergic inflammation
- 11.00-11.20** **J.-P. Li**, Uppsala  
Heparan sulfate in amyloidosis: good or bad?
- 11.20-11.40** **R. Lever**, London  
Effects of mast cells heparin on cell adhesion
- 11.40-12.00** **O. Livnah**, Jerusalem  
The crystal structure of human heparanase: the holy grail or the tin cup?
- 12.00-12.20** **Discussion**

	<p style="text-align: center;"><b>Friday, September 23<sup>rd</sup> 2011, afternoon</b></p> <p style="text-align: center;"><b>GLYCOSAMINOGLYCANS AS ANTICANCER AND ANTINFLAMMATORY DRUGS</b></p> <p style="text-align: center;">Moderators: <b>R. Krämer, E.A. Yates</b></p>
14.30-14.50	<b>G. Venkataraman</b> , Cambridge, MA <i>(Title to follow)</i>
14.50-15.10	<b>R.D. Sanderson</b> , Birmingham, Ala Shed proteoglycans as therapeutic targets
15.10-15.30	<b>I. Vlodayvsky</b> , Haifa Heparanase powers an inflammatory circuit that promotes colitis, psoriasis, and diabetic nephropathy
15.30-15.50	<b>A.V. Kumar</b> , Münster Role of 3-O-sulfated heparan sulfate in breast cancer pathogenesis
15.50-16.10	<b>Discussion</b>
16.10-16.30	<b>Tea, Coffee</b>
	<p style="text-align: center;"><b>ADVANCED APPROACHES IN THE GLYCOSAMINOGLYCAN ANALYSIS</b></p> <p style="text-align: center;">Moderators: <b>G. Torri, I. Vlodayvsky</b></p>
16.30-16.50	<b>C. Larive</b> , Riverside, CA Progress in the identification of heparan sulfate sequences
16.50-17.10	<b>A. Naggi</b> , Milan Profiling glycol-split heparin sequences
17.10-17.30	<b>R. Krämer</b> , Heidelberg Fluorescent assay for the rapid and direct detection of heparin
17.30-17.50	<b>E.A. Yates</b> , Liverpool A sensitive NMR method to compare a test heparin sample to a library of accepted heparins
17.50-18.10	<b>S. Lühn, S. Schiemann</b> , Kiel Quantification of sulfated glycans with a fluorescent sensor
18.10-18.30	<b>Discussion</b>

**Saturday, September 24<sup>th</sup> 2011, morning**

	<p style="text-align: center;"><b>HEPARINS, LOW-MOLECULAR WEIGHT HEPARINS, BIOTECHNOLOGICAL HEPARINS, AND NON-HEPARIN ANTITHROMBOTICS</b></p> <p style="text-align: center;"><b>Moderators: S. Alban, B. Mulloy</b></p>
9.00-9.20	<p><b>B. Mulloy</b>, Potters Bar A proposed new calibrant for molecular weight measurements of unfractionated heparin.</p>
9.20-9.40	<p><b>G. Nowak</b>, Jena New antithrombotics in the practice - use of standard dose or individual dose regimen ?</p>
9.40-10.00	<p><b>E. Gray</b>, Potters Bar Heparins of different animal origin and non-GAG new anticoagulants (<i>provisional title</i>)</p>
10.00-10.20	<p><b>G. Torri</b>, Milan Structure-activity relationships of monodisperse fractions of LMWHs</p>
10.20-10.40	<p><b>Coffee, tea</b></p>
10.40-11.00	<p><b>C. Viskov</b>, Paris Unusual sequences in antithrombin-binding heparin fragments</p>
11.00-11.20	<p><b>Discussion</b></p>
11.20-12.20	<p style="text-align: center;"><b>ROUND-TABLE DISCUSSION on CHMP paper of the EMA on generic LMWHs and Heparins from alternative animal sources</b></p> <p style="text-align: center;"><b>Moderators: A. Stemberger, E. Gray</b></p>
12.20-12.30	<p style="text-align: center;"><b>Closing remarks (B. Casu / J. Harenberg)</b></p>

## **General Information**

### **Thursday, September 22nd, 2011**

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

### **Friday, September 23rd, 2011**

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

### **Saturday, September 24th, 2011**

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  
Loveno di Menaggio  
I-22017 Menaggio (Como)

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