



## **Program**

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

New developments of anticoagulant and non-anticoagulant glycosaminoglycans and of other coagulation inhibitors – and the LMWH era after approval of a generic version by the FDA

**September 23<sup>rd</sup> - 25<sup>th</sup>, 2010**

**Organizers:**

**Job Harenberg**

Clinical Pharmacology, Faculty of Medicine  
Mannheim

**Benito Casu**

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

Welcome to Villa Vigoni 2010

As for the past seventeen editions, the 18<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, biotechnological heparins and heparan sulfates, and clinical pharmacology assessment of heparins and non-GAG antithrombotic agents.

A special topic is the discussion of the consequences of the approval of a generic version of a low-molecular-weight heparin by the FDA at the end of July 2010.

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

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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 biological assays, heparin contaminants, standardization and harmonization of methods

### Structure-function relationships

Interactions of glycosaminoglycans with platelet factor 4; heparin-induced thrombocytopenia. 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 23<sup>rd</sup>, 2010, afternoon**

14.30-14.40

**J. Harenberg** , Mannheim and **B. Casu**, Milan: Welcome address

**GLYCOMICS – APPLIED TO GAG-PROTEIN INTERACTIONS**

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

14.40-15.00

**J. Turnbull**, Liverpool

Profiling heparan sulfate structure and function: towards a systems view.

15.00-15.20

**C.K. Larive**, Riverside, CA

Finding a needle in a haystack: improving analytical methods for GAG characterization.

15.20-15.40

**M. Petitou**, Paris

Strategies for chemical synthesis and biological screening of heparan sulfate oligosaccharides.

15.40-16.00

**Discussion**

16.00-16.20

**Coffee and tea**

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16.20-16.40

**C. Viskov**, Paris

Antithrombin-binding heparin fragments.

16.40-17.00

**J. Gallagher**, Manchester

Targeting sulfate groups in heparan sulfate - Role of endosulfatases (Sulfs).

17.00-17.20

**Discussion**

**Special Lecture**

Moderators: **J. Harenberg, G. Nowak**

17.20-17.40

**M.B. Donati**, Campobasso.

Hemorrhagic risk of antithrombotic treatment.

17.40-18.00

**Discussion**

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**Friday, September 24<sup>th</sup> 2010, morning**

## **HEPARANASE – PATHOPHYSIOLOGICAL ASPECTS**

Moderators: **J. Gallagher, M. Götte**

**9.00-9.20**

**J.-P. Li**, Uppsala

Functions of heparin and heparanase in mast cells

**9.20-9.40**

**I. Vlodaysky**, Haifa

Role and mode of heparanase action in colitis, psoriasis and diabetic nephropathy.

**9.40-10.00**

**U. Lindahl**, Uppsala

Role of heparanase in regulation of appetite/energy metabolism.

**10.00-10.20**

**Discussion**

**10.20-10.40**

**Coffee and Tea**

## **GLYCOSAMINOGLYCANS IN INFLAMMATION AND CANCER - 1**

Moderators: **U. Lindahl** and **A. Stemberger**

**10.40-11.00**

**H. Lortat-Jacob**, Grenoble

Heparan sulfate differentially regulates the SDF  $\alpha$  and  $\beta$  chemokine isoforms.

**11.00-11.20**

**G. Bendas**, Bonn

Heparin species that interfere with the function of adhesion receptors.

**11.20-11.40**

**M. Götte**, Münster

Syndecan-1 in inflammation.

**11.40-12.00**

**L. Borsig**, Zurich

Ascidian dermatan sulfate attenuates metastasis, inflammation and thrombosis by inhibition of P-selectin

**12.00-12.20**

**Discussion**

**Friday, September 24<sup>th</sup>, afternoon**

**GLYCOSAMINOGLYCANS IN INFLAMMATION AND CANCER – 2**

Moderators: **R. Krämer, I. Vlodavsky**

- 14.30-14.50** **R.D. Sanderson**, Birmingham, Ala  
Nuclear heparan sulfate and inhibition of gene transcription  
In tumor cells
- 14.50-15.10** **A. Desch, S. Schneider**, Mannheim  
Influence of inhibition of thrombin generation on tumor growth
- 15.10-15.30** **V. Ferro**, Brisbane  
Polysulfated oligosaccharide glycosides as inhibitors of angiogenesis  
and tumor growth
- 15.30-15.50** **K. Kishimoto**, Cambridge  
A novel LMWH for tumor applications
- 15.50-16.10** **E. Vismara**, Milan  
Heparin-vectorized cyclodextrin
- 16.10-16.30** **Coffee and tea**

**CONVERGENT APPROACHES TO THE ANALYSIS OF HEPARIN**

Moderators: **B. Mulloy, G. Torri**

- 16.30-16.50** **E. Yates**, Liverpool  
Heparin analysis: A unique challenge?
- 16.50-17.10** **H. Szelke, R. Krämer**, Heidelberg  
Mix-and-measure fluorescence assays for the selective detection of  
glycosaminoglycans
- 17.10-17.30** **S. Lühn, S. Schiemann**, Kiel  
Quantification of sulfated glycans with a fluorescent sensor  
and novel heparanase assay.
- 17.30-17.50** **G. Nowak**, Jena  
Quantitative drug monitoring of direct factor Xa and factor IIa inhibitors
- 17.50-18.15** **Discussion**

**Saturday, September 25<sup>th</sup>, 2010**

9.30-10.50

**APPROVAL OF THE FIRST GENERIC LMWH BY THE FDA -  
What is the future of LMWHs**

**Round Table Discussion**

Moderators: **S. Alban, G. Torri**

9.30-9.50

**B. Mulloy**, Potters Bar

What are the problems to produce generic LMWHs

9.50-10.30

**Discussion**

10.30-10.50

**Tea and coffee**

**PHARMACOLOGICAL AND CLINICAL OVERVIEWS**

Moderators: **G. Palareti**,

10.50-11.10

**V. Laux**, Wuppertal

AT-independent inhibitors of coagulation proteins

11.10-11.30

**P. Prandoni**, Padua

Low-molecular-weight heparins and pentasaccharides for prevention and treatment of venous thromboembolism: achievements and prospects.

11.30-11.50

**G. Palareti**, Bologna

New *versus* old anticoagulants

11.50-12.10

**Discussion**

12.10-12.15

**Closing remarks** (B. Casu / J. Harenberg)

## **General Information**

### **Thursday, September 23rd, 2010**

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

### **Friday, September 24th, 2010**

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

### **Saturday, September 25th, 2010**

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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