



## SCIENTIFIC PROGRAM

# 24<sup>th</sup> Symposium on Glycosaminoglycans

## Heparin centenary.

September 15<sup>th</sup> – 17<sup>th</sup>, 2016

### Organizers:

Roland Krämer, Job Harenberg  
University of Heidelberg, Germany

Giangiaco Torri, Annamaria Naggi  
„G. Ronzoni“ Institute for Chemical and Biochemical Research,  
Milan, Italy

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Welcome to Villa Vigoni 2016

As for the past editions, the 24<sup>th</sup> Glycosaminoglycan Symposium will take place in Villa Vigoni (Loveno, Lake Como). Eminent specialists from all over the world are 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 80 participants.

The subjects selected for discussions include heparin synthesis, structural characterization and protein interactions, biological functions, clinical aspects including anti inflammatory and anti tumor activity. Moreover, wishing to continue the celebrations of the “heparin centenary”, a session dedicated to regulatory aspects regarding criteria of registration of low molecular weight heparins and new sources of pharmaceutical-grade heparin has been introduced.

Keynote speakers will outline the state-of-the art in each field and present novel results and future perspectives. 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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#### **Scientific board**

Giangiaco Torri, Job Harenberg, Roland Krämer, Ram Sasisekharan, Annamaria Naggi, Marco Guerrini, Benito Casu.

#### **Scientific Secretary**

Antonella Bisio

Thursday, September 15<sup>th</sup>, 2016, afternoon

14.30-14.40	<b>Welcome address J. Harenberg</b>  <b>SYNTHETIC GLYCOSAMINOGLYCANS</b>  Moderator: <b>A. Stemberger</b>
14.40-15.00	<b>J. Liu</b> , Chapel Hill Understanding the structure of activity of heparan sulfate using a synthetic approach
15.00-15.20	<b>X. Fernàndez-Busquets</b> , Barcelona Heparin and related polysaccharides against malaria: drugs, targeting elements, and mosquito medicines
15.20-15.40	<b>M. Petitou</b> , Paris Investigating heparanase inhibition by glycol-split heparin derivatives: study of a synthetic trisaccharide
15.40-16.00	<b>E. Vismara</b> , Milan Albumin and hyaluronic acid coated superparamagnetic iron oxide nanoparticles for biomedical applications
16.00-16.20	<b>Discussion</b>
16.20-16.40	<b>Coffee and Tea</b>
	<b>BIOLOGICAL ROLES OF HEPARIN/HEPARAN SULFATE</b>  Moderator: <b>R. Sasisekharan</b>
16.40-17.00	<b>L. Kjellén</b> , Uppsala Regulation of heparin and heparan sulfate N-sulfation
17.00-17.20	<b>E. Yates</b> , Liverpool Glycosaminoglycan interaction with amyloid
17.20-17.40	<b>J.-p. Li</b> , Uppsala Roles of glucuronyl C5-epimerase in (bio)synthesis of heparin/heparan sulfate - an overview
17.40-18.00	<b>M. Lima</b> , S. Paulo Understanding the "chaos" within heparin using complementary spectroscopic techniques
18.00-18.20	<b>Discussion</b>

Friday, September 16<sup>th</sup> 2016, morning

	<p style="text-align: center;"><b>NEW SOURCES OF PHARMACEUTICAL-GRADE HEPARIN</b></p> <p style="text-align: center;">Moderator: <b>J. Gallagher</b></p>
8.50 - 9.10	<p><b>J. Fareed</b>, Chicago Biochemical and pharmacological profiling of heparins derived from non porcine tissues and comparison with commercial heparins</p>
9.10 - 9.30	<p><b>F. Magalhães</b>, São Paulo Bovine Heparin Supply: current status and prospects, with focus on Latin America</p>
9.30 - 9.50	<p><b>Y. Yao</b>, JiangSu Alternative Source of Heparin Products with reference to the development of ovine heparins</p>
9.50 -10.10	<p><b>M. Guerrini</b>, Milan NMR characterization of crude heparins from various sources</p>
10.10 -10.30	<p><b>Discussion</b></p>
10.30-10.50	<p><b>Coffee and Tea</b></p>
	<p style="text-align: center;"><b>LOW MOLECULAR WEIGHT HEPARINS AND NEW HEPARIN SOURCES: REGULATORY ASPECTS</b></p> <p style="text-align: center;">Moderator: <b>J. Harenberg</b></p>
10.50-11.10	<p><b>A. Al-Hakim</b>, Silver Spring Reintroduction of bovine heparin to the US market</p>
11.10-11.30	<p><b>L. Montrasio</b>, Rome Use of starting materials collected from different animal sources for biological medicinal products</p>
11.30- 11.50	<p><b>E. Gray</b>, London Anticoagulant activity of bovine heparin</p>
11.50-12.10	<p><b>C. Viskov</b>, Paris Advanced methods for in depth characterization of LMWHs</p>
12.10-12.30	<p><b>Discussion</b></p>

Friday, September 16<sup>th</sup> 2016, afternoon

	<p style="text-align: center;"><b>ANTICOAGULANT and ANTITHROMBOTICS</b></p> <p style="text-align: center;">Moderator: <b>J. Fareed</b></p>
14.30-14.50	<p><b>G. Nowak, M. Lopez</b>, Jena Spontaneous platelet aggregation in heparinized whole blood as biomarker for the leaky gut syndrome</p>
14.50-15.10	<p><b>J. Walenga</b>, Chicago An update on the current methods used for the clinical validation of HIT antibodies</p>
15.10-15.30	<p><b>G. Arepally</b>, Durham Mechanisms of heparin's immunogenicity</p>
15.30-15.50	<p><b>S. Rivara</b>, Parma Inhibition of heparanase by roneparstat and discovery of novel small molecule inhibitors</p>
15.50-16.10	<p><b>Discussion</b></p>
16.10-16.30	<p><b>Coffee and Tea</b></p>
	<p style="text-align: center;"><b>HEPARIN AND OTHER GLYCOSAMINOGLYANS IN MALIGNANCY</b></p> <p style="text-align: center;">Moderator: <b>K. Kirchmaier</b></p>
16.30-16.50	<p><b>P. Barbieri</b>, Mendrisio Roneparstat and heparanase inhibition: future clinical perspectives in multiple myeloma and other diseases</p>
16.50-17.10	<p><b>I. Liewert, S. Alban</b>, Kiel Effects of sulfated glycans on chemokine- and C5a-mediated processes</p>
17.10-17.30	<p><b>N. Veraldi</b>, Milan Anti-inflammatory heparin derivatives for the treatment of cystic fibrosis</p>
17.30-17.50	<p><b>S. Alban, I. Liewert, A.-K. Schoenfeld</b>, Kiel SDF-1/CXCR4-axis as potential target for sulfated glycan</p>
17.50-18.10	<p><b>L. Borsig</b>, Zurich Glycosaminoglycans as decoys of chemokines</p>
18.10-18.30	<p><b>Discussion</b></p>

Saturday, September 17<sup>th</sup> 2016, morning

<b>HEPARIN AND OTHER GLYCOSAMINOGLYCANS IN MALIGNANCY</b>	
Moderator: <b>B. Mulloy</b>	
8.50-9.10	<b>U. Barash</b> , Haifa Involvement of heparanase in the pathogenesis of mesothelioma: basic aspects and clinical implications
9.10-9.30	<b>M. Schlesinger</b> , Bonn Heparin mediated Inhibition of the tumor cell platelet communication and the consequences for growth factor release
9.30-9.50	<b>G. Bendas</b> , Bonn LMWH for overcoming the chemoresistance of tumors - Will we find the mode of action?
9.50-10.10	<b>S. Guglietta</b> , Milan Coagulation induced by C3aR-dependent NETosis drives protumorigenic neutrophils during small intestinal tumorigenesis
10.10-10.30	<b>Discussion</b>
10.30-10.50	<b>Coffee and Tea</b>
<b>CHARACTERIZATION OF GLYCOSAMINOGLYCANS</b>	
Moderator: <b>G. Torri</b>	
10.50-11.10	<b>R. Krämer</b> , Heidelberg Heparin Red - a fast and robust assay for the quantification of glycosaminoglycans in various matrices
11.10-11.30	<b>T. Rudd</b> , London Heparin - A journey in to NMR and multivariate analysis
11.30-11.50	<b>Z. Shriver</b> , Boston Structural and biochemical examination of antibody-glycan interactions
11.50-12.10	<b>Discussion</b>
12.10-12.30	<b>Closing remarks: G. Torri / J. Harenberg</b>

## **General Information**

### **Thursday, September 15<sup>th</sup>, 2016**

12.30 -14.00 Lunch in Villa Vigoni  
20.00 Dinner in Villa Vigoni

### **Friday, September 16<sup>th</sup>, 2016**

8.00 - 9.00 Breakfast  
13.00 -14.00 Lunch in Villa Vigoni  
20.00 Dinner in Villa Vigoni

### **Saturday, September 17<sup>th</sup>, 2016**

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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