

Heparin Centennial Symposium

Loyola University Health Sciences Division
Departments of Pathology and Pharmacology

October 28-29, 2016

The International Union of Angiology has always fostered the coverage of timely topics in the diagnosis and management of vascular diseases including thrombotic and bleeding disorders. The field of anticoagulation is of great interest to vascular physician and surgeons and has been a focus of basic and applied research for the past several decades. Heparin and related drugs represent one of the oldest group of drugs which have been used for medical, surgical and interventional indications. The 2016 marks the 100 years of the discovery of this important drug. The IUA has organized several scientific symposium and discussion forum for the timely coverage of important issues related to the use of heparin. The IUA has also addressed the regulatory issues and contributed to the development of guidelines and consensus documents. On the occasion of the XXVII Bi-annual meeting of the IUA in Lyon, France several educational activities are planned. The IUA in collaboration with the North American Chapter and the Loyola University has organized a symposium to commemorate the 100 years heparin's discovery and the progress in both clinical and scientific areas. The Scientific Committee in collaboration with the faculty of the Loyola University has worked towards the development of this important symposium.

On behalf of the Loyola University Health Sciences Division, Hemostasis and Thrombosis Research Unit, of the Departments of Pathology and Pharmacology, we are pleased to extend an invitation to you and your colleagues to join us on October 28th in a one-day international symposium dedicated to update the advances in the clinical and applied developments of heparin and related drugs. This symposium is approved for 7 CME credit hours by the Loyola University Chicago, Stritch School of Medicine, Health Sciences Division. A certificate of participation will be provided. To celebrate this landmark occasion, we have invited some of the key opinion leaders to discuss recent developments in heparin research and its clinical applications. We are enclosing the program for your review.

In addition, we have also organized a special workshop on the resourcing of heparin with developments of bovine and ovine heparins and their implications on the production of such drugs as: sulodexide, danaparoid, and other byproducts such as defibrotide. This workshop will be held on October 29th. A program of this workshop is also enclosed. There is no registration fee to attend the symposium or workshop.

Please fill out the enclosed form regarding your participation and send it to Erin Erickson at ehalyerickson@luc.edu. Upon receipt of this form we will send you confirmation of your registration and provide you with detailed logistic information regarding hotels in our area and available transportation for your personal use.

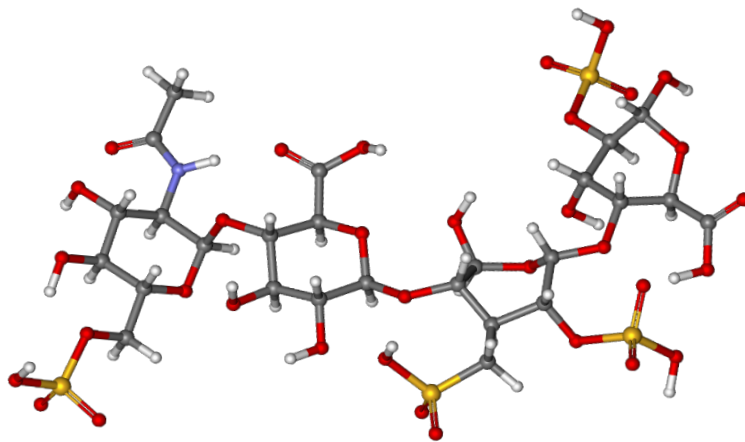
ACCREDITATION

The Loyola University Chicago, Stritch School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. The Loyola University Chicago, Stritch School of Medicine designates this live educational activity for a maximum of 7 AMA PRA Category 1 Credit(s)[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity. Nurses and other health professionals will receive a Certificate of Attendance. For information on applicability and acceptance, please consult your professional licensing board. Loyola University of Chicago is an Equal Opportunity Educator and Employer.



Heparin Centennial Symposium

*Scientific and Clinical Developments
and their Impact on the Understanding
of the Pathogenesis of
Thrombosis and its Management*



**Under the Auspices of
The International Union of Angiology
&
The North American Thrombosis Forum**

Friday, October 28, 2016

Auditorium

*Center for Translational
Research and Education*

Loyola University Medical Center

Introduction

The discovery of heparin by Jay McClean as a medical student at Johns Hopkins University in 1916 not only provided a universal anti-coagulant but also laid the foundation of the discipline of hemostasis and thrombosis. Much of what is known today in the area of bleeding and thrombotic disorders is based on the observations and scientific research on heparin and related drugs. The surgical, interventional, and medical usage of heparin has revolutionized medicine. For nearly one hundred years, newer discoveries and innovative findings continue to contribute to the expansion of our knowledge.

This international symposium is organized to commemorate the Heparin Centennial and will cover major developments in scientific and clinical arenas. Loyola University Chicago has been engaged in the investigations on heparin for nearly 50 years. The Department of Pathology fostered the development of an integrated program in basic, translational and clinical research and supported the development of Hemostasis and Thrombosis Laboratories in collaboration with the Department of Pharmacology. Heparin has remained the focused area of research for the Loyola group with national and international collaboration. This symposium will cover the developments in heparin drug substances, the development of heparin related drugs and the chemistry and biology of these drugs with the application of advanced methods for their studies. This symposium is open to basic scientists, clinicians, allied health professionals and regulatory groups. Attendance is limited to 200 attendees. This symposium is organized under the auspices of the International Union of Angiology (IUA) and the North American Thrombosis Forum (NATF). Both of these organizations are committed to increase the awareness of newer anticoagulants in the management of thrombosis.

Program Outline

Session I

- Chairpersons: Karel Roztocil, MD, PhD
Jawed Fareed, PhD
- 8:30 – 8:40am **Welcome and Opening Remarks**
Pieter De Tombe, PhD
- 8:40 – 9:00am **The Discovery of Heparin as a Landmark for the Foundation of Surgical Anticoagulation. A Cardiovascular Surgeon's Perspective**
Victor Ferraris, MD, PhD
- 9:00 – 9:40am **A Step-wise Evolution of Heparins and Synthetic Pentasaccharide**
Pierre Williame, MBA
- 9:40 – 10:00am **100 Years After the Discovery of Heparin. Lessons Learned**
Jawed Fareed, PhD
- 10:00 – 10:30am *Coffee Break*

Session II

- Chairpersons: Helena Nader, PhD
Shaker Mousa, PhD
- 10:30 – 10:50am **Structural Analysis of Heparins and Bioengineered Heparins**
Robert Linhardt, PhD
- 10:50 – 11:10am **Analysis of Heparins using Integrated Approaches**
Bernd Diehl, PhD
- 11:10 – 11:30am **Validation of Sole Anti-Xa Oligosaccharides as Antithrombotic Agents**
Jeanine Walenga, PhD
- 11:30 – 11:50am **The Discovery of Pentasaccharides and their Impact on the Development of Newer Therapeutic Agents**
Maurice Petitou, PhD
- 11:50 – 12:10pm **The Heparin Contaminants. Lessons Learned**
Marco Guerrini, PhD
- 12:10 – 12:30pm **The Ronzoni Institute. Impact on Heparin and GAG Sciences**
Giangiacomo Torri, PhD
- 12:30 – 1:30pm *Lunch*

Session III

Chairpersons: Job Harenberg, MD, PhD
Alexander G G Turpie MD

1:30 – 1:50pm **VTE Treatment with Heparins and Other Glycosaminoglycans**
Russell Hull, MD, PhD

1:50 – 2:10pm **Endothelial Modulators of Heparin. Lessons from Clinical Trials**
Debra Hoppensteadt, PhD

2:10 – 2:30pm **Glycosaminoglycans and Beyond**
Job Harenberg, MD, PhD

2:30 – 2:50pm **VTE Prevention with Heparin and Other GAGs in Major Orthopaedic Surgery**
Alexander G G Turpie, MD

2:50 – 3:10pm **Current Consensus on DVT Management. An Update**
Eduardo Ramacciotti, MD, PhD

3:10 – 3:40pm *Coffee Break*

Session IV

Chairpersons: Ali Al-Hakim, PhD
Umberto Cornelli, MD, PhD

3:40 – 4:00pm **Understanding the Structure Activity of Heparan Sulfate Using a Synthetic Approach**
Jian Liu, PhD

4:00 – 4:20pm **Heparins of Different Origins. Where Do We Stand?**
Helena Nader, PhD

4:20 – 4:40pm **Sheep and Bovine Heparins as Biosimilar Equivalent of Porcine Heparins**
Yiming Yao, PhD / Fabian Magalhaes, PhD

4:40 – 5:00pm **Sulodexide in Vascular Medicine.**
Giuseppe Maria Andreozzi, MD, PhD

5:00 – 5:20pm **Regulatory Position on the Development of Bovine Heparins**
Ali Al-Hakim, PhD

5:20 – 5:30pm **Invited Discussion**
Anna Maria Naggi, PhD

Resourcing of Heparins

An International Workshop

Saturday, October 29, 2016

This workshop is open to all interested individuals on the above stated topic. The workshop is sponsored under the auspices of the Scientific Committee of the International Union of Angiology and the Task Force on Anticoagulation Harmonization and Standardization Committee. The workshop will primarily focus on the newer developments in the sourcing of heparins with particular reference to bovine and porcine tissues. The recommendations from this workshop will be posted on the IUA website and will be published in *International Angiology*.

Chairpersons: A. Naggi, J. Walenga

9:00am **Introduction and Objectives**

J. Fareed

9:30am **Bovine Heparins Re-introduction**

F. Magalhaes

10:00am **Ovine Heparins and Enoxaparin**

Y. Yao

10:30am **Coffee Break**

11:00am **Analytical Consideration**

R. Linhardt

11:30am **NMR Characterization**

M. Guerrini

12:00pm **Assay Methods**

D. Hoppensteadt, J. Walenga

12:30pm **Regulatory Considerations**

S. Mousa, H. Nader

1:00pm **Lunch**

2:00pm **Invited Discussion**

A. Slobodin

2:30pm **Proposed Recommendations and Comments from the Participants**

3:00pm **Coffee Break**



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UNIVERSITY CHICAGO



Heparin Centennial Program
October 28-29, 2016
Loyola University Medical Center

Name: _____

Affiliation: _____

Phone Number: _____

E-mail: _____

Are you interested in participating in:

_____ Heparin Centennial Symposium (October 28, 2016)

_____ Heparin Workshop (October 29, 2016)

_____ Both

Do you need housing information?

_____ Yes

_____ No

Do you need any additional information or have any suggestions?

**Please email back this form with your response to
ehalyerickson@luc.edu as an attachment.**