Hemostasis & Thrombosis

Bruce Furie, MD, Co-Chief and
Barbara Furie, PhD, Co-Chief

Sheryl Bowley, PhD, Postdoctoral Fellow

The Division of Hemostasis and Thrombosis was formed in 2000, incorporating the Center for Hemostasis and Thrombosis Research and the Hemophilia and Thrombosis Clinical Center. This Division is focused on basic and clinical research related to blood coagulation and vascular biology, as well as clinical activities related to bleeding and thrombotic disorders.

2009–2010 HIGHLIGHTS

Clinical Highlights

The Division maintains an outpatient specialty clinic, the Hemophilia and Thrombosis Clinical Center. Patients are seen weekly with fellows by Drs. Bruce Furie, David Roth, Kenneth Bauer and Robert Flaumenhaft. This clinic represents a referral center for patients with bleeding or thrombotic disorders. Several clinical trials involved in understanding the relationship of cancer-associated thrombosis are closely integrated into this clinical program.

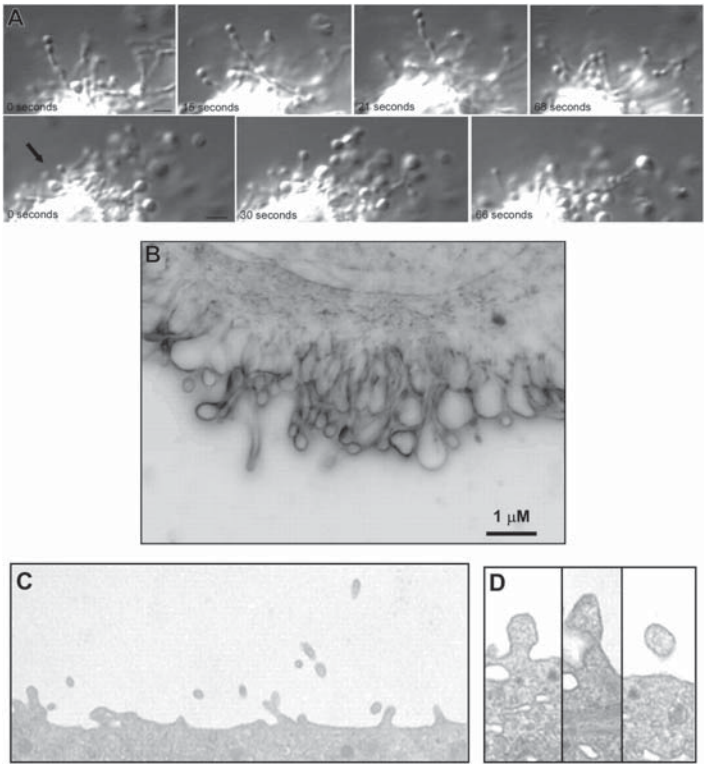
Educational Highlights

Drs. Bruce Furie and Barbara C. Furie were Presidents of the 22nd Congress of the International Society on Thrombosis and Haemostasis that met in Boston in July 2009. Dr. Kenneth Bauer was the Vice President of this congress and Dr. Flaumenhaft was the editor of its state-of-the-art book. Approximately 8,000 delegates from 99 countries attended this medical/scientific meeting. The fifth edition of the leading textbook in hematology, Hematology: Basic Principles and Practice, was published in 2009. Dr. Bruce Furie is a co-editor of this textbook, and Dr. Barbara C. Furie, Dr. Bruce Furie and Dr. Kenneth Bauer are chapter contributors.

Dr. Bruce Furie continues to lecture second year New Pathways students at Harvard Medical School in the Hematology course. Based on lectures from this course, Professor H. F. Bunn has developed a new textbook in hematology, Hematological Pathophysiology, for medical students. Dr. Furie prepared four chapters for this book, which has been recently published.

Research Highlights

Major activities in the laboratory include the study of thrombus formation in vivo using novel instrumentation developed by this group for real time in vivo confocal and widefield imaging in the microcirculation of a living mouse. High-resolution X-ray crystallographic structural studies have focused on the urokinase-urokinase receptor complex, Factor VIII, and conformers of tissue factor. In addition, the molecular basis of granule secretion in platelets is under study.



Megakaryocytes produce microparticles via an active, constitutive process.

HONORS AND AWARDS

Bruce Furie, MD, was elected Executive Director of the International Society on Thrombosis and Haemostasis. He serves for four years in a volunteer capacity. With the changes in the Bylaws, his position is now that of Secretary General.

Dr. Furie delivered the Sir John Dacie Memorial Lecture at Hammersmith Hospital in London UK. He was the Shapur Naimi Lecturer and Visiting Professor in Cardiology at Tufts Medical Center in Boston, MA and the Cardiovascular Institute Visiting Professor at Brigham and Women's Hospital in Boston, MA. Dr. Furie was also an invited speaker at the annual meeting of the British Society of Haematology in Edinborough, Scotland. Both **Drs. Bruce Furie** and **Barbara C. Furie** delivered the Roon Lecture at Scripps Research Institute, La Jolla, CA.

SELECTED PUBLICATIONS

Graham GJ, Ren Q, Dilks JR, Blair P, Whiteheart SW, Flaumenhaft R. Endobrevin/VAMP-8-dependent dense granule release mediates thrombus formation in vivo. *Blood* 2009; 114:1083-90.

Flaumenhaft R, Dilks JR, Richardson J, Alden E, Patel-Hett SR, Battinelli E, Klement GL, Sola-Visner M, Italiano JE Jr. Megakaryocyte-derived microparticles: direct visualization and distinction from platelet-derived microparticles. *Blood* 2009; 113:1112-21.

Zwicker JI, Liebman HA, Neuberg D, Lacroix R, Bauer KA, Furie BC, Furie B. Tumor-derived tissue factor-bearing microparticles are associated with venous thromboembolic events in malignancy. *Clin Cancer Res* 2009; 15:6830-6840.

Beglov D, Lee CJ, De Biasio A, Kozakov D, Brenke R, Vajda S, Beglova N. Structural insights into recognition of beta2-glycoprotein I by the lipoprotein receptors. *Proteins* 2009; 77:940-949.

Woronowicz K, Dilks JR, Rozenvayn N, Dowal L, Blair PS, Peters CG, Woronowicz L, Flaumenhaft R. The platelet actin cytoskeleton associates with SNAREs and participates in alpha-granule secretion. *Biochemistry* 2010; 49:4533-4542.

Liu Z, Lin L, Yuan C, Nicolaes GAF, Chen L, Meehan EJ, Furie B, Furie BC, Huang M. Trp2313-His2315 of the FVIII C2 domain are involved in membrane binding: Structural analysis of a complex between the C2 domain and an inhibitor of membrane binding. *J Biol Chem* 2010; 285:8824-8829.

Atkinson BT, Jasuja J, Chen V, Nandivada P, Furie B, Furie BC. Laser-induced endothelial cell activation supports fibrin formation. *Blood* 2010; 116:4675-4683.

Lee CJ, De Biasio A, Beglova N. Mode of interaction between beta2GPI and lipoprotein receptors suggests mutually exclusive binding of beta2GPI to the receptors and anionic phospholipids. *Structure* 2010; 18:366-376.

FACULTY

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RESEARCH FUNDING

	Direct	Indirect
Federal	2,611,083	1,253,626
Non Federal	285,417	21,806