

- [ScienceWatch Home](#)
- [Inside This Month...](#)
- [Interviews](#)

- [Featured Interviews](#)
- [Author Commentaries](#)
- [Institutional Interviews](#)
- [Journal Interviews](#)
- [Podcasts](#)

Analyses

- [Featured Analyses](#)
- [What's Hot In...](#)
- [Special Topics](#)

Data & Rankings

- [Sci-Bytes](#)
- [Fast Breaking Papers](#)
- [New Hot Papers](#)
- [Emerging Research Fronts](#)
- [Fast Moving Fronts](#)
- [Corporate Research Fronts](#)
- [Research Front Maps](#)
- [Current Classics](#)
- [Top Topics](#)
- [Rising Stars](#)
- [New Entrants](#)
- [Country Profiles](#)

About Science Watch

- [Methodology](#)
- [Archives](#)
- [Contact Us](#)
- [RSS Feeds](#)



[Interviews](#)

[Analyses](#)

[Data & Rankings](#)

2009 : July 2009 - Fast Moving Fronts : Martin Alexander Schwartz

FAST MOVING FRONTS - 2009

July 2009



Martin Alexander Schwartz talks with ScienceWatch.com and answers a few questions about this month's Fast Moving Front in the field of Clinical Medicine.



Article: A mechanosensory complex that mediates the endothelial cell response to fluid shear stress

Authors: Tzima, E;Irani-Tehrani, M;Kiosses, WB;Dejana, E;Schultz, DA; Engelhardt, B;Cao, GY;DeLisser, H;Schwartz, MA
 Journal: NATURE, 437 (7057): 426-431 SEP 15 2005
 Addresses: Scripps Res Inst, Dept Cell Biol, 10550 N Torrey Pines Rd, La Jolla, CA 92037 USA.
 Scripps Res Inst, Dept Cell Biol, La Jolla, CA 92037 USA.
 Univ Milan, Mario Negri Inst Pharmacol Res, I-20139 Milan, Italy.
 Univ Milan, Fac Sci, Dept Biomol & Biotechnol Sci, FIRC Inst Mol Oncol, I-20139 Milan, Italy.
 (addresses have been truncated)

SW: Why do you think your paper is highly cited? Does it describe a new discovery, methodology, or synthesis of knowledge?

It provides the first coherent model for how forces from flowing blood are transduced into a biochemical signal. What is particularly significant is that it connects many effects of flow from previous studies into a single pathway. It is both a new discovery as well as a synthesis of knowledge.

SW: Would you summarize the significance of your paper in layman's terms?

Atherosclerosis is a chronic inflammation of specific sites in artery walls. Cholesterol and other risk factors determine how atherosclerosis progresses. However, the forces that flowing blood exert on the endothelial cells that line our arteries are responsible for initiating atherosclerosis. This paper describes a group of proteins that mediate the response to flow in the endothelial cells. These inflammatory responses initiate the event that leads to atherosclerosis.

"Atherosclerosis is a chronic inflammation of specific sites in artery walls. Cholesterol and other risk factors determine how atherosclerosis progresses..."

SW: How did you become involved in this research and were any particular problems encountered along the way?

We got interested in the general area of how endothelial cells respond to flow from a collaborator, Dr. Shu Chien of the University of San Diego, Department of Bioengineering, who needed our expertise in integrin signaling. Studying the integrins led us to the discovery of the mechanotransduction complex that was reported in the *Nature* paper. It was really just matter of following the data, one step at a time.

SW: Where do you see your research leading in the future?

We would like to understand the basic molecular mechanisms of how forces from blood act on the mechanotransduction complex. We are also exploring the roles of integrin signals as possible avenues for pharmacological or other interventions that could be used in the clinic.


SW: Do you foresee any social or political implications for your research?

I can foresee medical implications, but not social or political.

Martin Alexander Schwartz, Ph.D.
Professor of Microbiology, Biomedical Engineering, and Cell Biology
Mellon Urological Cancer Research Institute
Cardiovascular Research Center
University of Virginia
Charlottesville VA, USA

KEYWORDS: NF-KAPPA-B; NITRIC-OXIDE; AFFINITY MODULATION; ACTIVATION; ATHEROSCLEROSIS;
TRANSDUCTION; CADHERIN; MECHANOTRANSDUCTION; PROLIFERATION; PERMEABILITY.



[back to top](#) 

2009 : July 2009 - Fast Moving Fronts : Martin Alexander Schwartz

[Science Home](#) | [About Thomson Reuters](#) | [Site Search](#)

[Copyright](#) | [Terms of Use](#) | [Privacy Policy](#)