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BME People

Sandra Rugonyi

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Current Appointments

Assistant Professor, Department of Biomedical Engineering

Office

Center for Health and Healing

3303 SW Bond Avenue

Mail code: CH13B

Rm #13037

Education

Ph.D. in Mechanical Engineering, Massachusetts Institute of Technology, 2001

MS in Mechanical Engineering, Massachusetts Institute of Technology, 1999

Nuclear Engineering degree, Balseiro Institute, Argentina, 1995

Department(s)

Biomedical Engineering

Research Interests

Dr. Rugonyi's main research interests include the analysis of biological systems, and the development of mathematical and computational models that describe them. Finite element methods and other numerical techniques, when used with appropriate physically-based models, provide a means of calculating and visualizing the response of systems to different conditions. Dr. Rugonyi's current research is mainly on the study of cardiovascular systems, which includes the analysis of blood flow through vessels and the heart, as well as the interaction of flow with tissue.

Research Project(s)

Cardiac Development

Cardiac Growth

Pulmonary Surfactant Biophysics

Thrombus Formation

Research Group(s)

Vascular Cell Research

Selected Publications

S. Rugonyi, E. C. Smith and S. B. Hall, "Effect of viscosity and compression rate on the collapse phase transition of pulmonary surfactant at an air-water interface", in *Computational Fluid and Solid Mechanics Vol. 2*, K.J.Bathe Ed., Elsevier, 2003.

S. Rugonyi, E.C. Smith and S.B. Hall 2004. Transformation diagrams for the collapse of a phospholipid monolayer, *Langmuir*, 20:10100-10106.

S. Rugonyi and S.B. Hall, "The basis of low surface tensions in the lungs", in *Lung Surfactant Function*



and Disorder, K. Nag, Ed., Taylor and Francis Group, 2005, pp. 173-189.

S. Rugonyi, E.C. Smith and S.B. Hall 2005. Kinetics for the collapse of trilayer liquid-crystalline disks from a monolayer at an air-water interface, *Langmuir*, 21:7303-7307.

S.B. Hall and S. Rugonyi, "Alveolar surface mechanics", In *Encyclopedia of Respiratory Medicine*, Elsevier, 2006, pp. 101-106.

S. Rugonyi, S.C. Biswas and S.B. Hall 2008. The Biophysical Function of Pulmonary Surfactant, *Respiratory Physiology and Neurobiology*; Special issue on Respiratory Biomechanics, in press.

T.A. Siebert and S. Rugonyi 2008. Influence of liquid layer thickness on pulmonary surfactant spreading and collapse, *Biophysical Journal*, 163:244-255.



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