

The Mathematical Biosciences Institute Public Lecture Series
at The Ohio State University welcomes

Peter T. Macklem

Physician and Director, Meakins-Christie Laboratories
Montreal Chest Institute, McGill University Health Centre
Montreal, Quebec

A Physician's View of Complexity: the Origins of Order, Health, and Disease

Two relatively unexplored features characterize life and health:

- 1) living things are complex, non-linear, and dynamic, resulting in emergent phenomena that can neither be predicted nor explained by examining component parts in isolation;
- 2) they have become highly ordered throughout the course of Darwinian evolution in apparent violation of the second law of thermodynamics.

It follows that energy dissipation to decrease entropy and interconnections among component parts play a role in emergent phenomena and the origin of order. The required amount of energy and the number and nature of interconnections must be known in order to understand health and to develop a theory of disease that goes beyond the interaction of genetic and environmental causes. The development of statistical mechanics to quantify probabilities in quantum mechanics is the tool to study these processes. Dr. Macklem will discuss how our understanding of health and disease depends on uncovering the secrets of energy-dissipating, interconnected complex biological systems.

Peter T. Macklem has been a leader in respiratory research for more than four decades. He pioneered the study of small airway function—identifying the early pulmonary damage affected by smoking—and demonstrated that normal respiratory muscle function is compromised during acute respiratory failure. He earned his M.D. from McGill University in 1956 and became a fellow of the Royal College of Medicine in 1963. At McGill, he became founding director of the Meakins-Christie Laboratories for Respiratory Research in 1972, chair of the Department of Medicine in 1980, and scientific director of the Respiratory Health Network of Centres of Excellence in 1990. Dr. Macklem was a medalist of the American College of Chest Physicians (1979), was elected a fellow of the Royal Society of Canada (1982), and is an Officer of the Order of Canada.

For more information on the MBI, visit mbi.osu.edu.



Tuesday, November 7, 2006
6:30 p.m.
Fawcett Center Auditorium
2400 Olentangy River Road



The MBI is an NSF
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The lecture is free and open to the public.
A reception with complimentary food and a cash bar will follow.

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Sponsored by the National Science Foundation, the Mathematical Biosciences Institute at The Ohio State University is the only national institute devoted entirely to the interaction of the mathematical sciences with the life sciences. The MBI offers a community of mathematical and biological scholars the opportunity to collaborate in developing new mathematical theories, statistical methods, and computational algorithms for the analysis of the vastly growing amount of biological data.



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MATHEMATICAL BIOSCIENCES INSTITUTE



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