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“Bacterial operon dynamics: Insight from mathematical modeling”

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Dupuis Hall, Room 217

BIO

Michael C. Mackey received his undergraduate degree in Mathematics from the University of Kansas in 1963, and his doctorate in Physiology and Biophysics from the University of Washington in 1968. Following military service he joined the McGill University faculty in 1971 as a member of the Department of Physiology. He is currently the Joseph Morley Drake Professor of Physiology at McGill and holds associate membership in the McGill Departments of Mathematics and Physics, teaching in all three. He was the Director of the Centre for Nonlinear Dynamics in Physiology and Medicine and is the founding Director of the new Centre for Applied Mathematics in Bioscience and Medicine. Prof. Mackey received a research prize in 1993 from the Alexander von Humboldt Stiftung, was elected to the Royal Society of Canada in 1999, was a Fellow of the Hanse Wissenschaftskolleg in 2000, and was the Leverhulme Visiting Professor of Mathematical Biology at Oxford University in the 2001 and 2002 academic years. His research interests include the dynamics of physiological systems, and the foundations of statistical mechanics and quantum mechanics.



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ABSTRACT

The regulation of dynamics in several bacterial operons has been the object of intense research, and it is now clear that mathematical modeling of these systems is able to give both qualitative and quantitative insight into experimental data on these dynamics at both the single cell and population level. This talk will discuss the nature of the bistability observed in the (inducible) lactose operon, the lysis-lysogeny switch in phage lambda, and the possible occurrence of oscillatory dynamics in the repressible tryptophan operon.

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