Centre for Research in Molecular Modeling
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UNIVERSITÉ Concordia UNIVERSITY

Joint Seminar Series of the
CENTRE FOR RESEARCH IN MOLECULAR MODELING and the DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

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Marquette University (WI, USA)

Antagonistic Molecules: S-Nitrosothiols and Beyond

This talk will introduce a novel concept of antagonistic molecules and demonstrate its power to address many important problems of biological chemistry. We define antagonistic molecules as molecules whose chemical properties are determined, to a significant degree, by a combination and competition of two antagonistic resonance structures, i.e. structures which are chemical opposites of one another in terms of chemical bonding and formal charges on atoms. We will show how the antagonistic paradigm provides an elegant explanation of the paradoxical properties of S-nitrosothiols (RSNOs), ubiquitous biological molecules, and to makes a number of far-reaching predictions with a significant potential impact on the biomedical research.

Qadir Timerghazin received his undergraduate degree in Chemistry from Bashkir State University, Ufa, Bashkortostan, Russia, in 1997. He then pursued graduate studies in Physical Organic Chemistry at the Institute of Organic Chemistry, Ufa Research Centre of the Russian Academy of Science, where he received a Ph.D. for studies of reactions of ozone and chlorine dioxide with organic compounds in 2000. He then moved to Montreal, Quebec, Canada, where he spent a few months at McGill University, studying atmospherically important reactions of chlorine and bromine atoms with Prof. Parisa A. Ariya, and then earned a Ph.D. in Computational Chemistry at Concordia University, also in Montreal, under the direction of Prof. Gilles H. Peslherbe, studying the structure, photochemistry and charge-transfer-to-solvent dynamics of anionic clusters. He then spent one year as a Postdoctoral Fellow in the group of Prof. Ann M. English at Concordia University, where he studied the reactivity of S-nitrosothiols and modeled mass-spectrometry aspects of nitroxyl radicals, before moving to the University of Alberta, Edmonton, Alberta, Canada in 2007 as an Alberta Ingenuity Postdoctoral Fellow, to study the photochemistry of fluorescent proteins under direction of Prof. Alex Brown. In 2009 he joined group of Prof. Pierre-Nicholas Roy at the University of Waterloo, Waterloo, Ontario, Canada as a Natural Sciences and Engineering Research Council (NSERC) Postdoctoral Fellow. Dr. Timerghazin joined the faculty at Marquette University in August 2010.