

Curriculum vitae

Alexander L. Rabinovich

Academic degree: Dr. Sci. (physics and mathematics: condensed matter physics)

Occupation: Head Researcher at the Laboratory of Ecological Biochemistry, Institute of Biology, Karelian Research Center, Russian Academy of Sciences.

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Research Fields:

Physical and chemical biology, molecular biophysics, polymer and biopolymer physics and chemistry, condensed matter physics, biochemistry, theoretical conformational analysis of chain molecules, self-organizing systems, biomacromolecules, and lipid membrane systems. PhD Thesis: 'Usage of the continuum model for problems of conformational statistics of macromolecules'. Dr.Sci. Thesis: 'Properties of unsaturated lipid membrane systems and their constituents: computer simulations'.

Research Methods:

Monte Carlo and Molecular Dynamics computer simulations.

Scientific and organizational activities:

He was the head of several projects of Russian Foundation for Basic Research (RFBR) during 1995-1997, 2000-2002, 2003-2005, 2006-2008, and 2010-2012; a participant of the RFBR projects during 1997, 1997-1999, 2000-2002, 2001-2003, 2008, 2009, 2011; a participant of grants 894.2003.4, 4310.2006.4, 306.2008.4, 3731.2010.4 for leading research schools of Russian Federation. He participated in several EU-based joint research projects supported by NWO (The Netherlands – Russia), INTAS (Hungary – Italy – Russia), Swedish Institute Visby (Sweden – Russia) foundations. He is a member of councils for PhD and DrSci Theses defence in Condensed Matter Physics (Petrozavodsk State University) and in Biochemistry (Karelian State Pedagogical Academy).

Publications: Published over 320 works (including over 120 papers) in the field.

Selected papers:

Rabinovich A.L., Ripatti P.O. On the conformational, physical properties and functions of polyunsaturated acyl chains // *Biochimica et Biophysica Acta*. 1991. V.1085. No.1. pp.53-62.

Rabinovich A.L., Ripatti P.O. The flexibility of natural hydrocarbon chains with non-methylene-interrupted double bonds // *Chemistry & Physics of Lipids*. 1991. V.58. No.3. pp.185-192.

Rabinovich A.L., Ripatti P.O. Polyunsaturated hydrocarbon chains of lipids: structure, properties, functions (in Russian) // *Uspekhi sovremennoi biologii (Progress of modern biology)*. 1994. V.114. No.5. pp.581-594.

Rabinovich A.L., Ripatti P.O. Intramolecular ordering of the bonds of hydrocarbon chains of lipids. Computer simulation // *Biophysics (Engl. Transl.)*. 1997. V.42. No.1. pp.143-151.

Rabinovich A.L., Ripatti P.O. Computer modelling of the intramolecular ordering of the bonds of cis-octadecene chains // *Biophysics (Engl. Transl.)*. 1997. V.42. No.4. pp.879-887.

Rabinovich A.L., Ripatti P.O. A theoretical study of the intramolecular ordering of the bonds of trans-octadecene chains // *Biophysics (Engl. Transl.)*. 1997. V.42. No.4. pp.889-895.

Rabinovich A.L., Ripatti P.O. Intramolecular bond orientational order in cis-octadecadienoic chains of natural lipids: Monte Carlo simulations // *Biophysics (Engl. Transl.)*. 1998. V.43. No.2. pp.268-275.

Rabinovich A.L., Ripatti P.O. A Monte Carlo study of intramolecular bond ordering in hydrocarbon chains // *Russian Journal of Physical Chemistry (Engl. Transl.)*. 1998. V.72. No.4. pp.590-594.

Rabinovich A.L., Ripatti P.O. Intramolecular ordering of bonds in the cis-4,7,10,13,16,19-docosahexaenic chain // *Doklady Biophysics (Engl. Transl.)*. 1999. Vols.364-366. pp.6-9.

Rabinovich A.L., Ripatti P.O. A computer investigation of intramolecular bond ordering: unsaturated chains of natural lipids // *Membrane and Cell Biology*. 2000. V.13. No.5. pp.697-714.

Rabinovich A.L., Ripatti P.O. Intramolecular ordering in octadecatrienoic chains with cis double bonds: a computer study // *Biophysics (Engl. Transl.)*. 2000. V.45. No.5. pp.790-796.

Rabinovich A.L., Ripatti P.O. Polyunsaturated hydrocarbon chains: a computer study of the characteristics of intramolecular bond ordering // *Biophysics (Engl. Transl.)*. 2000. V.45. No.5. pp.797-804.

Balabaev N.K., Rabinovich A.L., Ripatti P.O., Kornilov V.V. Molecular dynamics of monolayers consisting of polyunsaturated lipids // *Russian Journal of Physical Chemistry (Engl. Transl.)*. 1998. V.72. No.4. pp.595-598.

Rabinovich A.L., Ripatti P.O., Balabaev N.K. Molecular dynamics investigation of bond ordering of unsaturated lipids in monolayers // *Journal of Biological Physics*. 1999. V.25. No.2. pp.245-262.

Rabinovich A.L., Balabaev N.K. Molecular dynamics simulations of unsaturated lipid bilayers // *Proceedings of SPIE*. 2001. V.4348. pp.215-224.

Rabinovich A.L., Ripatti P.O., Balabaev N.K. Molecular dynamics of lipid bilayers: fluctuation properties of hydrocarbon chains // *Russian Journal of Physical Chemistry (Engl. Transl.)*. 2002. V.76. No.11. pp.1824-1828.

Rabinovich A.L., Ripatti P.O., Balabaev N.K., Leermakers F.A.M. Comparative investigation of lipid membrane systems // Proceedings of SPIE. 2002. V.4627. pp.141-153.

Rabinovich A.L., Ripatti P.O., Balabaev N.K., Leermakers F.A.M. Molecular dynamics simulations of hydrated unsaturated lipid bilayers in the liquid-crystal phase and comparison to self-consistent field modeling // Physical Review. E. 2003. V.67. No.1. 011909.

Leermakers F.A.M., Rabinovich A.L., Balabaev N.K. Self-consistent-field modelling of unsaturated phosphatidylcholine liquid-crystalline bilayers and comparison to all-atom molecular dynamics simulation // Physical Review. E. 2003. V.67. No.1. 011910.

Rabinovich A.L., Ripatti P.O., Balabaev N.K. Molecular parameters of hydrated bilayers of unsaturated phosphatidylcholines // Russian Journal of Physical Chemistry (Engl. Transl). 2004. V.78. No.7. pp.1004-1009.

Rabinovich A.L., Balabaev N.K., Alinchenko M.G., Voloshin V.P., Medvedev N.N., Jedlovszky P. Computer simulation study of intermolecular voids in unsaturated phosphatidylcholine lipid bilayers // The Journal of Chemical Physics. 2005. V.122. 084906.

Leermakers F.A.M., Rabinovich A.L. Interaction of cholesterol-like molecules in polyunsaturated phosphatidylcholine lipid bilayers as revealed by a self-consistent field theory // Physical Review E. 2007. V.76. No.3. 031904.

Rabinovich A.L., Kornilov V.V., Balabaev N. K., Leermakers F.A.M., Filippov A.V. Properties of Unsaturated Phospholipid Bilayers: Effect of Cholesterol // Biochemistry (Moscow), Series A: Membrane and Cell Biology. 2007. V.1. No.4. pp.343-357.

Kornilov V.V., Rabinovich A.L., Balabaev N.K., Bessonov V.V. Effect of Cholesterol on the Structure and Dynamical Properties of Unsaturated Phospholipid Bilayers (in Russian) // Biofizika. 2008. V.53. Issue 1. pp.84-92.

Kornilov V.V., Rabinovich A.L., Balabaev N.K. Effect of Cholesterol on the Bond Ordering of Unsaturated Lipid Molecules in Hydrated Bilayers (in Russian) // Biofizika. 2008. V.53. Issue 2. pp.250-260.

Rabinovich A.L. Temperature Dependence of Conformational Properties of Oligomer Chains of Natural Lipids: Computer Simulations (in Russian) // Biofizika. 2008. V.53. Issue 3. pp.426-433.

Rabinovich A.L., Ivanov V.A. Review of computer simulation methods of molecular systems: Monte Carlo (in Russian) // In: Computer simulations for study of polymers and biopolymers (in Russian). V.A. Ivanov, A.L. Rabinovich, A.R. Khokhlov, eds. Moscow, Book-house "LIBROCOM" Publ., 2009. Chapter 3, pp.63-119.

Rabinovich A.L. Chain molecules as constituents of membrane systems: computer simulations (in Russian) // In: Computer simulations for study of polymers and biopolymers (in Russian). V.A. Ivanov, A.L. Rabinovich, A.R. Khokhlov, eds. Moscow, Book-house "LIBROCOM" Publ., 2009. Chapter 12, pp.409-454.

Kornilov V.V., Rabinovich A.L., Balabaev N.K. Molecular Dynamics simulation of unsaturated phospholipid bilayers with high content of cholesterol (in Russian) // In: Computer simulations

for study of polymers and biopolymers (in Russian). V.A. Ivanov, A.L. Rabinovich, A.R.Khokhlov, eds. Moscow, Book-house "LIBROCOM" Publ., 2009. Chapter 13, pp.455-489.

Lyubartsev A.P., Rabinovich A.L. Recent development in computer simulations of lipid bilayers // *Soft Matter*. 2011. V.7. No.1. pp.15-26.