

VOLODYMYR RYBALCHENKO

SENIOR RESEARCH EXPERT



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PROFILE

Biomedical research scientist with MIT-level physics engineering background and **strong capacity to initiate novel technology projects in experimental and cell biology**. My expertise includes but is not limited by the fields where the physiological models require technically challenging tests at the level of primary cells, immortalized cell cultures, tissue specimens and organs. Multiparameter micro-environment control around biospecimens, low-cost automation, high throughput, advanced data collection and analysis are my priorities to provide a **top-notch level for your advanced biomedical experimentations or exciting pilot projects**. I am a **passionate worker**: little-impact merely routine operations would underutilize my optimal capacity (IQ=125 clinically tested during a head injury recovery :) Although, I might be able to add some extra creativity for your quality control and material- and biosafety protocols practicing an inherently rigorous and systematic approach. I am capable to carry out both independent and collective projects. I like to collaborate with enthusiastic people, sharing my experience with ones and learning from others.

PROFESSIONAL EXPERIENCE

UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER, Dallas, TX

Assistant Professor of Neurology, 2012 – Present; **Instructor of Physiology**, 2009 – 2010

Created an industrial-grade installation for control of micro-environment around small bio-specimens having no world analogs. Optimized a standard international protocol for microelectrode recordings from small muscle preparations resulting in a unique ability of stable hours-long measurements of muscle intracellular membrane potentials. Earned a promotion after essential improvement of the novel technique of recording of the oocyte recombinant protein electrical signals. Assumed a leadership role in teaching students and peers on how to develop new technical approaches for biomedical experimentations relying on low-budget solutions. Accomplished scientific results:

- discovered a previously unreported molecular mechanism of skeletal muscle periodic paralysis
- provided evidence that BI-1 protein protects cells by forming pores in endoplasmic membranes

NATIONAL INSTITUTES OF HEALTH, Institute of Dental and Craniofacial Research, Bethesda, MD

Research Fellow, 2010 – 2012

Working with model cell cultures, identified a new candidate target protein for pharmacological treatment of fluid secretion deficiency in dry mouth/dry eye disease. Bio-engineered the cell monolayers grown on solid substrates that can provide a model system that substitutes the epithelial tissue in a variety of biomedical tests. Learned to function within government regulations and protocols, obtained a federal radiation safety certification. Served as an appointed member of the institutional IT development committee. Accomplished scientific results:

- for the first time reported biophysical properties of the endosomal TPC1 ion channel proteins
- provided proof that TPC1 can be involved in intracellular signaling and endosomal trafficking

UNIVERSITY OF NORTH TEXAS HEALTH SCIENCE CENTER, Fort Worth, TX

Research Assistant Professor of Pharmacology, 2004 – 2008

Developed a novel installation for biophysical tests involving artificial planar lipid bilayers with markedly improved bio-specimen stability compared to available commercial samples. Elaborated specific experimental conditions to allow electrical signal recordings from isolated cellular nuclei, a technique available in only a few laboratories in the world. Served as a Graduate Faculty lecturer for the Biomedical Science students. Accomplished scientific results:

- discovered a possible mechanism of neurodegeneration via deregulation of intracellular calcium
- evidenced possible involvement of polycystine proteins in tear production by lacrimal gland cells

YALE UNIVERSITY SCHOOL OF MEDICINE, New Haven, CT

Research Associate of Surgery, 2000 – 2004

Learned the highest standards in professional research ethics and strategy. Successfully challenged a world dominant concept for one particular mechanism of sound recognition in the area of research on deafness, put forward and supported with experimental results an alternative hypothesis, thus preventing hundreds of thousands of dollars in the world to be spent at potentially wrong pharmaceutical premises. The international citation record after my publications related to this work exceeds one hundred. Accomplished scientific results:

- discovered a physiologically relevant ionic conductance in outer hair cells of the auditory system
- discovered that a variety of anions alongside with Cl⁻ control the auditory motor protein prestin

UNIVERSITY OF SCIENCE AND TECHNOLOGY, Lille, France

Education Engineer, 1999 – 2000

Held multitasking between two projects; first, a computer image analysis software engineering project for a newly created real-time cancer cell mobility tracking system; second, academic research on molecular mechanisms of suppression of the prostate cancer cell proliferation. Over 40 international citations referred to this work in the scientific journals. Accomplished scientific results:

- discovered inhibition of proliferation of the prostate cancer epithelial cells by a drug verapamil
- identified a molecular domain of the K⁺ ion channels targeted by verapamil in cancerous cells

LOUIS PASTEUR UNIVERSITY, Strasbourg, France

Postdoctoral Fellow, 1994 – 1999

Conducted commercial pharmacological tests for Sanofi Corporation and academic research sponsored by the Biocodex that led to a discovery of a molecular mechanism of neuronal silencing by the non-benzodiazepine anxiolytic etifoxine. This work was referred by over 50 international citations. Conducted academic research sponsored by the Eli Lilly Corporation on neuronal mechanisms of glutamate and supervised the undergraduate student research projects. Created a functional computer-operated mini-robotic installation to conduct high-throughput pharmacological and electrophysiological tests. *Commercialization has never been attempted due to a non-supportive academic environment.* Accomplished scientific results:

- discovered a bimodal potentiation of the neuronal GABA-A receptors by a drug etifoxine
- for the first time reported the non-equivalent binding sites on the glutamate-AMPA receptors

Early career: (Electronics engineering, research equipment design, biophysics modeling, cell physiology/neurophysiology, biochemistry/electrophysiology, pharmacological tests)

NATIONAL ACADEMY OF SCIENCE OF UKRAINE, Institute of Bioorganic Chemistry, Kiev Ukraine

Jr Research Scientist, Department of Biomedical Research, 1987–1994

NATIONAL ACADEMY OF SCIENCE OF UKRAINE, Bogomoletz Institute of Physiology, Kiev Ukraine

Research Engineer, Departments: Smooth Muscle Physiology, 1982–1983; General Physiology, 1984–1987

SELECTED AWARDS

- Postdoctoral Service Fellowship – *Eli Lilly Institute of France*, 1996-1999
- Postdoctoral Fellowship – *Foundation for Medical Research of France*, 1995
- International Trainee Fellowship – *France Ministry of Education*, 1994
- Engineering and Business in Canada – *Canada Ministry of Cultural Affairs*, 1993

LANGUAGES

- English
- French
- Russian
- Ukrainian

EDUCATION

PhD, Biology / Bioorganic Chemistry – Moscow Institute of Physics and Technology (Kiev Branch)

MS, Physics Engineering / Biophysics – Moscow Institute of Physics and Technology (Russian MIT)