

CURRICULUM VITAE

Ruben M. Markosyan

Present address: Department of Molecular Biophysics and Physiology
Rush University Medical College.
1653 W. Congress Pkwy,
Chicago, IL, 60612
Tel: (312) 942-5005; Fax: (312) 942-8711
E-mail: rmarkosy@rush.edu

Home address: 751 Williams Way, Vernon Hills, IL, 60061
Tel: (847) 247-9329

Education and Training:

<u>Major</u>	<u>Year</u>	<u>Institution</u>
Ph.D. in Physiology	1998	Scientific Board of the Institute of Physiology, Acad. Sci. Armenia, Yerevan.
MS in Physics	1985	Yerevan State University, Department of Physics.
BS in Medical Cybernetics	1983	Yerevan Polytechnic Institute, Department of Cybernetics.

Ph.D. Thesis: *“Neuronal Mechanism of Regulation of Bulbar Vago-Salitary Neurons by Structures of Amigdaloid Nuclei”*

Professional Experience:

2001 – present **Assistant Professor**, Department of Molecular Biophysics and Physiology, Rush Medical College (Chicago)

1999 – 2001 **Instructor**, Department of Molecular Biophysics and Physiology, Rush Medical College (Chicago)

1997 – 1999 **Post Doctoral Fellow**, Department of Molecular Biophysics and Physiology, Rush Medical College (Chicago)

1994 – 1997 **Graduate student**, Laboratory of Physiology of Autonomic Nervous System, Institute of Physiology, Acad. Sci. Armenia

1991 – 1994 **Research Associate**, Laboratory of Physiology of Autonomic Nervous System, Institute of Physiology, Acad. Sci. Armenia

1985 – 1991 **Senior Engineer**, Laboratory of Physiology of Autonomic Nervous System, Institute of Physiology, Acad. Sci. Armenia

Procedural Expertise:

- extensive experience in cell labeling and designing functional cell fusion experiments;
- imaging single virus-cell fusion in real time;
- confocal microscopy, fluorescence video-microscopy, image processing;
- Immunofluorescence;
- electrophysiology: time-resolved admittance measurements of cell-cell fusion in whole-cell patch clamp configuration;
- cell culture, protein expression and analysis;
- flow cytometry;
- microiontophoresis;
- DNA preparation and purification;
- extensive experience in animals surgery.

Memberships:

American Biophysical Society, Armenian Physiological Society, Armenian Neuroscience Society

Grants, fellowships:

- UCR grant in 2001 “Membrane fusion catalyzed by a retroviral envelope protein.”

List of Publications:

1. **Markosyan, R.M.** , F.S. Cohen and G.B. Melikyan. Time- resolved imaging of HIV-1 Env-mediated lipid and content mixing between a single virion and cell membrane. *Molecular Biology of the Cell*, 2005, v.16, p.5502-5513, USA.
2. Mkrtychyan S.R, **Markosyan R.M.**, Eadon M.T, Moore J.T, Melikyan G.B, Cohen F.S. Ternary complex formation of human immunodeficiency virus type 1 Env, CD4, and chemokine receptor captured as an intermediate of membrane fusion. *Journal of Virology*, 2005, v79(17), p.11161-11169, USA.
3. Melikyan G.B, Barnard R.J, **Markosyan R.M.**, Young J.A, Cohen F.S. Low pH is required for avian sarcoma and leucosis virus Env-induced hemifusion and fusion pore formation but not for pore growth. *Journal of Virology*, 2004, v.78, N7,p.3753-3762, USA.
4. **R.M. Markosyan** , P. Bates, F.S. Cohen and G.B. Melikyan. Avian Sarkoma and Leukosis Virus Env can fold into a six-helix bundle prior to membrane merger. *Biophysical Journal*, 2004, Nov. 87(5) ,p3291-3298, USA.
5. **Markosyan R.M.**, Cohen F.S., Melikyan G.B. HIV-1 envelope proteins complete their folding into six-helix bundles immediately after fusion pore formation. *Molecular Biology of the Cell*, 2003, v.14, p.926-938, USA.
6. Abrahamyan L.G., **Markosyan R.M.**, Moore J.P., Cohen F.S., Melikyan G.B. HIV-1 Env with an intersubunit disulfide bond engages coreceptors, but requires bond reduction after engagement to induce fusion. *Journal of Virology*, 2003, v.77, N10, p.5829-5836, USA.
7. E.Borrego-Diaz, M.E. Peeples, **R.M. Markosyan**, G.B. Melikyan, and F.S. Cohen. Completion of trimeric hairpin formation of influenza virus hemagglutinin promotes fusion pore opening and enlargement. *Virology*, 2003, v.316, issue2, p234-244, USA.
8. Fredric S. Cohen, **Ruben M. Markosyan**, and Grigory B. Melikyan. The process of membrane fusion: Nipples, Hemifusion, Pores, and Pores Growth. *Current Topics in Membrane*, 2002 ,v.52, USA.
9. **Markosyan R.M.**, Ma X., Lu M., Cohen F.S., Melikyan G.B. The mechanism of inhibition of HIV-1 Env-mediated cell-cell fusion by recombinant cores of gp41 ectodomain. *Virology*, 2002, v.302, N1, p.174-184, USA.
10. **Markosyan R.M.**, Melikyan G.M., Cohen F.S. Evolution of intermediates of influenza virus hemagglutinin-mediated fusion revealed by kinetic measurements of pore formation. *Biophysical Journal*, 2001, v.80, p.812-821, USA.
11. Baclavajian O.G., Avetissian E.A., **Markosyan R.M.**, Adamian F.A., Petrossian A.A. Electrophysiological study of the mechanisms of corticofugal regulation of

- activity of vagal viscerosensorial neurons of solitary tract nuclei. *Neurophysiology*, 2000, v.32 p.10-16, Ukraine.
12. Melikyan G.M., **Markosyan R.M.**, Brener S.A., Rozenberg Y., Cohen F.S. Role of cytoplasmic tail of ecotropic moloney murine leukemia virus env protein in fusion pore formation. *Journal of Virology*, 2000, v.74, p.447-455, USA.
 13. **Markosyan R.M.**, Cohen F.S., Melikyan G.M. The lipid-anchored ectodomain of influenza virus hemagglutinin is capable of inducing nonenlarging fusion pores. *Molecular Biology of the Cell*, 2000, v.11, p.1143-1152, USA.
 14. Melikyan G.M., **Markosyan R.M.**, Hemmati H., Delmedico M.K, Lambert D.M., Cohen F.S. The transition of HIV-1 gp-41 into a six-helix bundle, not the bundle configuration, induces membrane fusion. *Journal of Cell Biology*, 2000, v. 151, N2, p.413-423, USA.
 15. Avetissian E.A., Adamian F.A., Petrossian A.A., **Markosyan R.M.** Role of different structures in regulation of activity of bulbar vagosolitary viscerosensorial neurons of solitary tract nuclei. *Archives of Clinical and Experimental Medicine*, 2000, v9, N1, p.37-39, Ukraine.
 16. Melikyan G.M., **Markosyan R.M.**, Roth M.G., Cohen F.S. A point mutation in transmembrane domain of the hemagglutinin of influenza virus stabilizes a hemifusion intermediate that can transit to fusion. *Molecular Biology of the Cell*, 2000, v.11, p.3765-3755, USA.
 17. **Markosyan R.M.**, Melikyan G.M., Cohen F.S. Tension of membranes expressing the hemagglutinin of influenza virus inhibits fusion. *Biophysical Journal*, 1999, v.77, p.943-952, USA.
 18. Baclavajian O.G., Avetissian E.A., Migaelian R.N., Adamian F.A., **Markosyan R.M.**, Petrosian A. Neuronal mechanisms of regulation of bulbar vagosolitary neurons activity by the structures of baso-lateral nuclei of amygdala. *Russian Journal of Physiology*, 1998, v.84, p.164-172, Russia.
 19. Avetissian E.A., Adamian F.A., **Markosyan R.M.**, Petrossian A.A. Characteristics of influence of cortical structures on the activity of viscerosensory neurons of the vago-solitary complex. *Second Conf. Armenian IBRO Association*, 1998, p.19, Armenia.
 20. Avetissian E.A., Adamian F.A., Petrossian A.A., **Markosyan R.M.** The role of the frontal areas of the limbic cortex in regulation of activity of viscerosensory neurons of vagosolitary complex. *Fifth IBRO World Congr. of Neuroscience*, 1998, p.50, Israel.
 21. Nersessian L.B., Manoukian N.K., **Markosyan R.M.** Microelectrophysiological investigation of the reactions of bulbar respiratory center neurons on stimulation of

frontal ventral thalamic nucleus. *Armenian Biological Journal*, 1996, v.46, N 2, p. 220-225, Armenia.

22. Avetissian E.A., Adamian F.A., **Markosyan R.M.**, Petrosian A.A. Neuronal organization of mygdalo-visceral reflex. *Proceedings of the First Conference of Armenian International Brain Research Organization (IBRO) Association*, 1996, p.19, Armenia.
23. Nersessian L.B., **Markosyan R.M.** Some cortical mechanisms of regulation of the activity of brain stem respiratory neurons. *Proceedings of the 50th Anniversary of the Orbeli Institute of Physiology*, 1993, p.75, Armenia.
24. Krishian E.M., **Markosyan R.M.**, Sarukhanian R.V. Microsystem for the physiological experiment results analysis on the "Electronica D3-28" computer. *Proceedings of the 6th All-Union Conference on the Physiology of Autonomic Nervous System*, 1986, p.170, Armenia.
25. **Markosyan R.M.** Microsystem for the automated analysis of neuronal activity. *Proceedings of the V Conference of Young Physiologists of UnderCaucasus*, 1986, p.62