

CURRICULUM VITAE

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BUSINESS ADDRESS : Department of Biochemistry
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EDUCATION

B.Sc. : Chemistry and Mathematics, 1982,
Kiev State University

M.Sc. : Analytical Chemistry, 1984,
Kiev State University

Ph.D. : Bioinorganic Chemistry, 1988,
Institute of Physical Chemistry
Acad. Sci. of Ukraine.
Title of the Dissertation: "Formation of Copper(II)
Complexes with Opioid and Immunoregulatory
Peptides"

Postdoctoral Training : Biochemistry, Food Chemistry, 1994 - 1998
University of Missouri-Columbia,
Columbia, Missouri.

PROFESSIONAL EXPERIENCE

Scientist : Bioinorganic Chemistry Division, Institute of
Physical Chemistry Acad. Sci. of Ukraine,
Kiev, 1988 - 1991

Senior Scientist : Institute of Physical Chemistry Acad. Sci. of
Ukraine, Kiev, 1992 - 1993

Head of Lab : Electroless Plating Lab, KREOMA Enterprise,
Kiev, 1992 - 1993

Postdoctoral Fellow : Laboratory and Environmental Testing, Inc.,
Columbia, Missouri, 1993 ; University of Missouri, Columbia,

Missouri, 1994 - 1998

Research Assistant : University of Missouri-Columbia,
Professor Columbia, Missouri, 1998 -

Senior Research : University of Missouri-Columbia,
Chemist Columbia, Missouri, 1999 -

PROFESSIONAL ACTIVITIES

Membership : American Chemical Society, 2000 -
All-Union D.I.Mendeleev Chemical Society, 1990 - 1992
All-Union Society of Inventors and Rationalizers, 1988 - 1992

Reviewer : Grant Proposals, ACS Petroleum Fund, 2003
Grant Proposals, National Science Foundation, 2005-2008
Journal of the American Chemical Society
Journal of Agricultural and Food Chemistry
Journal of Carbohydrate Chemistry
Biochimica et Biophysica Acta
Carbohydrate Research
Food Science and Technology
Ukrainian Chemical Journal
Ph.D. Dissertations, Institute of Physical Chemistry Acad. Sci.
of Ukraine, 1991-1993
M.Sc.Theses, Chemistry Department, Kiev State University, 1993
M.Sc.Theses, McGill University, Montreal, 2008

HONORS

NIH Travel Award (10th Prouts Neck Prostate Cancer Meeting), 2004
Prostate Cancer Foundation Research Award, 2005
Prostate Cancer Foundation Meeting Travel Award, 2006
DOD Meeting Travel Award, 2007

RESEARCH INTERESTS

Carbohydrate chemistry and biochemistry. Carbohydrate-based anti-tumor agents. Maillard reaction in foods and *in vivo*.

PUBLICATIONS IN REFEREED JOURNALS

Glinsky VV, Kiriakova G, Glinskii OV, Mossine VV, Mawhinney TP, Turk JR, Glinskii AB, Huxley VH, Price JE, Glinsky GV. Synthetic galectin-3 inhibitor increases metastatic cancer cell sensitivity to taxol-induced apoptosis in vitro and in vivo. *Cancer Res.* (2008, submitted)

Mossine VV, Chopra P, Mawhinney TP. Interaction of tomato lycopene and ketosamine against rat prostate tumorigenesis. *Cancer Research* **68**: 4384-4391 (2008)

Liu SD, Whiting CC, Tomassian T, Pang M, Bissel SJ, Baum LG, Mossine VV, Poirier F, Huflejt ME, Miceli MC. Endogenous galectin-1 functions to enforce class I restricted TCR functional fate decisions in thymocytes. *Blood* **112**: 120-130 (2008)

Mossine VV, Mawhinney TP. N^{α} -(1-deoxy- β -D-fructopyranos-1-yl)-L-histidine ("D-fructose-L-histidine"): a potent copper chelator from tomato powder. *Journal of Agricultural and Food Chemistry* **55**: 10373-10381 (2007)

Mossine VV, Barnes CL, Mawhinney TP. The structure of N -(1-deoxy- β -D-fructopyranos-1-yl)-L-proline monohydrate ("D-fructose-L-proline") and N -(1,6-dideoxy- α -L-fructofuranos-1-yl)-L-proline ("L-rhamnulose-L-proline"). *Journal of Carbohydrate Chemistry* **26**: 249-266 (2007)

Johnson KD, Glinskii OV, Mossine VV, Turk JR, Mawhinney TP, Anthony DC, Henry CJ, Huxley VH, Glinsky GV, Pienta KJ, Raz A, Glinsky VV. Galectin-3 as a potential therapeutic target in tumors arising from malignant endothelium. *Neoplasia* **9**: 662-670 (2007)

Mossine VV, Barnes CL, Mawhinney TP. Solubility and crystal structure of $N\alpha$ -(1-deoxy- β -D-fructopyranos-1-yl)-L-histidine monohydrate ("D-fructose-L-histidine"). *Carbohydrate Research* **342**:131-138 (2007)

Ortwerth BJ, Chemoganskiy V, Mossine VV, Olesen PR. The effect of UVA light on the anaerobic oxidation of ascorbic acid and the glycation of lens proteins. *Investigative Ophthalmology and Visual Science* **44**: 3094-3102 (2003).

Glinsky VV, Glinsky GV, Glinskii OV, Huxley VH, Turk JR, Mossine VV, Deutscher SL, Pienta KJ, Quinn TP. Intravascular metastatic cancer cell homotypic aggregation at the sites of primary attachment to the endothelium. *Cancer Research* **63**: 3805-3811 (2003).

Khaldoyanidi SK, Glinsky VV, Sikora L, Glinskii AB, Mossine VV, Quinn TP, Glinsky GV, Sriramarao P. MDA-MB-435 human breast carcinoma cell homo- and heterotypic

adhesion under flow conditions is mediated in part by Thomsen-Friedenreich antigen-galectin-3 interactions. *Journal of Biological Chemistry* **278**: 4127-4134 (2003).

Mossine VV, Barnes CL, Feather MS, Mawhinney TP. Acyclic tautomers in crystalline carbohydrates: The keto forms of 1-deoxy-1-carboxymethylamino-D-2-pentuloses (pentulose-glycines). *Journal of the American Chemical Society* **124**:15178-15179 (2002).

Wu X, Palfey BA, Mossine VV, Monnier VM. Kinetic studies, mechanism and substrate specificity of amadoriase I from *Aspergillus sp.* *Biochemistry* **40**:12886-12895 (2001).

Linetsky M, LeGrand RD, Mossine VV, Ortwerth BJ. Sugar-mediated crosslinking of α -biotinylated lysine to cysteamine-agarose support: A method to isolate Maillard Lys-Lys-like crosslinks. *Journal of Applied Biochemistry and Biotechnology* **94**:71-96 (2001).

Mossine VV, Linetsky M, Glinsky GV, Ortwerth BJ, Feather MS. Superoxide free radical generation by Amadori compounds: the role of acyclic forms and metal ions. *Chemical Research in Toxicology* **12**: 230-236 (1999).

Prabhakaram M, Mossine VV. Characterization of a blue fluorophore isolated from in vitro reaction of N^{α} -acetyllysine and 3-deoxyglucosone. *Preparative Biochemistry and Biotechnology* **28**: 319-338 (1998).

Lee KW, Mossine V, Ortwerth BJ. The relative ability of glucose and ascorbate to glycate and crosslink lens proteins in vitro. *Experimental Eye Research* **67**: 95-104 (1998).

G.V. Glinsky, J.E. Price, V.V. Glinsky, V.V. Mossine, G. Kiriakova, and J.B. Metcalf. Inhibition of Human Breast Cancer Metastasis in Nude Mice by Synthetic Glycoamines. *Cancer Research* **56**: 5319-5324 (1996).

V.V. Mossine, C.L. Barnes, G.V. Glinsky, and M.S. Feather. Molecular and Crystal Structure of N-(2-Deoxy-D-aldohexos-2-yl)-glycines (Heyns Compounds). *Carbohydrate Research* **284**: 11-24 (1996).

G.V. Glinsky, V.V. Mossine, J.E. Price, D. Bieleuberg, V.V. Glinsky, H. Ananthaswamy, and M.S. Feather, Inhibition of Colony Formation in Agarose of Metastatic Human Breast Carcinoma and Melanoma Cells by Synthetic Glycoamine Analogs. *Clin. Exp. Metastasis* **14**: 253-267 (1996).

V.V. Mossine, C.L. Barnes, G.V. Glinsky and M.S. Feather, Interaction between Two C(1)-X-C'(1) Branched Ketoses: Observation of an Unprecedented Crystalline *spiro*-Bicyclic Hemiketal Tautomer of N,N-Di(1-deoxy-D-fructos-1-yl)-glycine ("Difuctose Glycine") Having Open Chain Carbohydrate. *Carbohydr. Lett.* **1**: 355-362 (1995).

J. Hirsch, V.V. Mossine and M.S. Feather, The Detection of Some Dicarbonyl Intermediates Arising from the Degradation of Amadori Compounds (The Maillard Reaction). *Carbohydrate Research* **273**:171-177 (1995).

T.V. Denisevich, R.A. Semyonova-Kobzar, V.V. Glinsky and V.V. Mosin, The Influence of Synthetic Aminoglycoconjugates on the Aggregation Ability and Metastatic Potential of Tumor Cells. *Exp. Oncol.* **17**:111-117 (1995).

V.V. Mossine, G.V. Glinsky, C.L. Barnes and M.S. Feather, Crystal Structure of an Amadori Compound, N-(1-Deoxy- β -D-fructopyranos-1-yl)-glycine ("Fructose-glycine"). *Carbohydrate Research* **266**:5-14 (1995).

V.V. Mossine, G.V. Glinsky and M.S. Feather, The Preparation and Characterization of Some Amadori Compounds (1-Amino-1-Deoxy-D-Fructose Derivatives) Derived from a Series of Aliphatic ω -Amino Acids. *Carbohydrate Research* **262**:257-270 (1994).

K.B. Yatsimirskii, V.V. Mosin, A.N. Kozachkova and I.A. Efimenko, Palladium(II) Complexation by Glycine, L-Alanine, L-Histidine, and Histamine in Solutions Containing Chloride Ions. *Russ. J. Coord. Chem.* **19**:740-743 (1993).

K.I. Yakovlev, A.I. Stetsenko, V.V. Mosin et al., Reactivity of trans-Dinuclear Platinum(II) Complexes with Polymethylene Diamines. *Russ. J. Inorg. Chem.* **37**: 1491 (1992).

V.Y. Zayats, V.V. Mosin, G.A. Kozlov and Y.N. Shevchenko, Composition and Stability of Tartrate-Nickel(II) Complexes. *Russ. J. Coord. Chem.* **18**:287-291 (1992).

Y.Z. Voloshin, V. Mosin and E.N. Korol, FAB Mass Spectrometry of Macrobicyclic Boron-containing Iron(II) Dioximates. *Inorg. Chim. Acta* **180**:189-193 (1991).

K.B. Yatsimirskii, V.V. Mosin and A.N. Kozachkova, Complexation of Palladium(II) Aquaion with Aliphatic Amino Acids. *Russ. J. Inorg. Chem.* **36**:3135-3138 (1991).

K.B. Yatsimirskii and V.V. Mosin, Komplexbildung des Kupfer(II) mit Opioidpeptiden. *Z. anorg. allg. Chem.* **577**:293-300 (1989).

K.B. Yatsimirskii, V.A. Pokrovskii, V.V. Mosin, G.I. Chipens, R.E. Vegner and I.R. Rituma, Fast Atom Bombardment Mass Spectrometry of Highly Polar Peptides - Immunoactive Fragments of Proteins. *Izv. Akad. Nauk LatvSSR, Ser. Khim.*:230-236 (1988).

K.B. Yatsimirskii, G.V. Ustyuzhanina and V.V. Mosin, Complexation of Copper(II) with Natural Enkephalins. *Teor. Eksp. Khim.* **24**:126-127 (1988).

K.B. Yatsimirskii, V.A. Pokrovskii, A.G. Kolchinskii and V.V. Mosin, Formation of Binary and Ternary Complexes of Copper(II) with Enkephalin and Histidine. *Teor. Eksp. Khim.* **23**:634-641 (1987).

V.A. Pokrovskii and V.V. Mosin, Fast Atom Bombardment Mass Spectrometry: a Method and Its Applications. *Teor. Eksp. Khim.* **23**:62-78 (1987).

K.B. Yatsimirskii, V.A. Pokrovskii, A.G. Kolchinskii, V.V. Mosin and B.G. Mischanchuk, Mass-spectrometric and ESR Study of Copper(II) - Enkephalin and Histidine Interaction. *Doklady Akad. Nauk SSSR* **292**:933-937 (1987).

CHAPTERS IN BOOKS

Mossine VV, Glinsky VV, Mawhinney TP. Food-related carbohydrate ligands for galectins. In: Klyosov AA, Witczak ZJ, Platt D. *Galectins*. Wiley: 2008 , pp. 233-268.

Mawhinney TP , Chance DL, Waters JK, Mossine VV, He S, Cassity NA. Characterization of sulfated blood group antigen-containing oligosaccharides isolated from human respiratory mucous glycoproteins. In: *Recent Developments in Carbohydrate Research. Vol 1*. Transworld Research Network. Kerala, India: 2003, pp.1-25.

M.S. Feather and V.V. Mossine, Correlation between Structure and Reactivity of Amadori Compounds: the Reactivity of Acyclic Forms. A refereed book chapter in: *The Maillard Reaction in Foods and Medicine*. The Royal Society of Chemistry. London: 1998, pp.37-42.

B.J. Ortwerth, K.-W. Lee, A. Coats, and V. Mossine , The Relative Oxidation, Glycation and Crosslinking Activity of Glucose and Ascorbic Acid *in vitro*. A refereed book chapter in: *The Maillard Reaction in Foods and Medicine*. The Royal Society of Chemistry. London: 1998, pp.256-261.

M.S. Feather, V.V. Mossine, and J. Hirsch, Use of Aminoguanidine to Trap and Measure Dicarbonyl Intermediates Produced During the Maillard Reaction. A refereed book chapter in: *Chemical Markers for Processed and Stored Foods (ACS Symp. Series, vol.631)*: 24-31 (1996).

BOOK REVIEWS

M.S. Feather and V.V. Mossine, A review of "The Maillard reaction: Consequences for the Chemical and Life Sciences. Edited by R. Ikan. Wiley: New York, 1996". *J. Am. Chem. Soc.* **119**:11135 (1997).

PATENTS

Huflejt, M. E.; Mossine, V.V.; Croft, M. Galectin-1 and galectin-4 in tumor development and use in prognosis and treatment of breast cancer. PCT Int. Appl. (2003), 41 pp. WO 0326494 A2 20030403

Pat. USSR 1473645 E.V. Kuzminskii, O.A. Mashkin, V.V. Mosin et al., Chemical Power Cell

Pat. USSR 1419438 K.B. Yatsimirskii, E.V. Kuzminskii, V.V. Mosin et al., Chemical Power Cell

INVITED PRESENTATIONS

“Fructosamines as Potential Anti-tumor Agents”. Missouri State University Department of Chemistry seminar series. Springfield, MO, October 9, 2006.

“Carbohydrate-Based Approaches towards Cancer Prevention and Therapy”. American Association for Laboratory Animal Science seminar series, Columbia, MO, May 31, 2006.

“Solution Equilibria of Amadori Compounds”; University of South Carolina, Department of Chemistry & Biochemistry, Columbia, SC, March 21, 1997.

“Glycation of Amino Acids, Peptides, and Proteins: Implications in Diabetes”; University of Missouri, Nutritional Sciences Program, Columbia, MO, November 2, 1995.

SYMPOSIA PRESENTATIONS

Oral:

Mossine VV, Mawhinney TP. Amadori compounds may have cancer prevention potential. 234th American Chemical Society National Meeting, Boston, MA, Aug 19-23, 2007.

Mossine VV, Mawhinney TP. Effects of lactulosamines in cancer models. 234th American Chemical Society National Meeting, Boston, MA, Aug 19-23, 2007.

Yatsimirskii KB, Mosin VV. Complexes of some 3-d metals with opioid and immunoregulatory peptides. Int. Symp. on Applied Bioinorganic Chemistry, Wuhan, China, 1990.

Pokrovskii VA, Yatsimirskii KB, Mosin VV. A Study of the Complexation of Transition Metals with Bioligands by FAB MS. XI Ukrainian Conference on Inorganic Chemistry, Uzhgorod, Ukraine, 1986.

V.A.Pokrovskii, K.B.Yatsimirskii, V.V.Mosin, Fast Atom Bombardment Mass Spectrometry of Metal-Peptide Complexes. IV All-Union Conf. on Mass Spectrometry, Soomy, Ukraine, 1986.

Posters/Abstracts:

Mossine VV, Mawhinney TP. Ketosamines: food-related glycoaminoconjugates with a prostate cancer prevention potential. DOD Prostate Cancer Research Program Meeting “Innovative Minds in Prostate Cancer Today” Atlanta, GA, Sep 5-8, 2007.

Mawhinney TP, Chance DL, Mossine VV, Cassity N, Waters JK. Use of isomeric butyl ketoximes in the identification of isomeric fructosylamino acids by gas-liquid chromatography/ triple quadrupole mass spectrometry. 55th ASMS Conference on Mass Spectrometry, Indianapolis, IN, Jun 3 - 7, 2007.

Mossine VV, Mawhinney TP. Food-related Glycoaminoconjugates as Potentially Chemopreventive Agents. 5th Annual AACR International Conference on Frontiers in Cancer Chemoprevention Research, Boston, MA, Nov 12 - 15, 2006.

Mossine VV, Mawhinney TP. Prevention and Treatment of Prostate Cancer with Dietary Ketosamine Antioxidants. The Prostate Cancer Foundation 13th Annual Scientific Retreat, Scottsdale, AZ, Oct 19 - 21, 2006.

Mossine VV, Mawhinney TP. Anti-Tumor Effects of 1-Amino-1-Deoxy-D-Fructose Derivatives. 23rd International Carbohydrate Symposium, Whistler, BC, Canada, July 23-28, 2006.

Mossine VV, Mawhinney TP. Anti-Tumor Effects of Food-Related Ketosamines. The Prostate Cancer Foundation 12th Annual Scientific Retreat, Scottsdale, AZ, Sep 29 - Oct 2, 2005.

Mossine VV, Mawhinney TP, Glinsky VV, Huflejt ME. Lactulosamine-based Agents for Treatment of Advanced Cancer. 3rd Annual Conference ‘Glycomics and Carbohydrates in Drug Development’, La Jolla, CA, Mar 21-22, 2005.

Mossine VV, Mawhinney TP, Glinsky VV, Huflejt ME. Carbohydrate-based Agents for Treatment of Advanced Prostate Cancer. Presented at 10th Prouts Neck Prostate Cancer Meeting, Prouts Neck, ME, Nov 4-7, 2004.

Huflejt M, Mossine V, Naidenko O, Jazayeri M, Rogers P, Tinari N, Iacobelli S, Elliott M, Lustgarten, J, Croft M. Synthetic lactulose amines bind tumor-promoting galectins –1 and –4, and inhibit breast cancer in Her-2/*neu* transgenic mice. 24th Annual San Antonio Breast Cancer Symposium. San Antonio, TX, Dec 10-13, 2001.

Mossine VV, Feather MS, Unusual stabilization of acyclic tautomers in 1-amino-1-deoxy-ketoses. 19th International Carbohydrate Symposium, La Jolla, CA, 9-13 August 1998.

V.V. Mossine and M.S. Feather, Metal Binding Properties of Glycated Amino Acids and Proteins. 6th International Symposium on the Maillard Reaction, London, 27-30 July 1997. In: *The Maillard Reaction in Foods and Medicine*. The Royal Society of Chemistry. London: 1998, p.429.

A. Frankel, G.V. Glinsky, V.V. Mossine, R. Buckman, R.S. Kerbel, Synthetic Glycoamine Analogs Synergize With Taxol and Cisplatin in Inducing Programmed Cell Death in Ovarian Cancer Cells. *Proc. Annu. Meet. Am. Assoc. Cancer Res.* **38**:A627 (1997).

V.V.Mossine, G.V.Glinsky, C.L.Barnes, M.S.Feather, Structural Elucidation of Amino Acids Glycated with Glucose, Lactose, Galactose, and Fructose. XXXVII Annu. West Central Biochem. and Mol. Biol. Conf., Columbia, Mo., 1994.

G.V.Glinsky, V.V.Mossine, V.V.Glinsky, T.V.Denisevich, M.S.Feather, Synthetic Glycoamines as Inhibitors of Cancer Cell Adhesion and Metastasis. West Central Biochem. and Mol. Biol. Conf., Columbia, Mo., 1994.

K.B.Yatsimirskii, A.N.Kozachkova, V.V.Mosin, An interaction of tetrachloropalladate with amino acids. XIII Ukrainian Conf. on Inorg. Chem., Uzhgorod, 1992.

V.Y.Zayats, Y.N.Shevchenko, V.V.Mosin, A Study of Complex Formation in Basic Solutions of Nickel(II) and Tartrate. XIII Ukrainian Conf. on Inorganic. Chem., Uzhgorod, 1992.

K.B.Yatsimirskii, V.V.Mosin, A Refinement of Initial Titration Parameters Under Complex Stability Determination. XII Ukrainian Conf. on Inorganic Chem., Simferopol, 1989.

K.B.Yatsimirskii, E.N.Korol, V.V.Mosin et al., On the Formation of Copper(II) Complexes with Opioid Peptide and Histidine. XV All-Union Conf. on Coordination Chem., Kiev, 1985.

K.B.Yatsimirskii, A.G.Kolchinskii, V.V.Mosin, Synthesis and a Study of a New Tetraazamacrocyclic Copper Complex. II All-Union Conf. on Macrocyclic Chem., Odessa, 1984.