

## CURRICULUM VITAE

IRINA STEPANOV

### IDENTIFYING INFORMATION

#### Academic Rank

Assistant Professor, Division of Environmental Health Sciences

#### Education

Degree	Institution	Date Degree Granted
B.S.	Moldova State University Chemistry	1997
Ph.D.	Moldova State University Chemistry/Industrial and Ecological Chemistry [Advisor prof. Gheoghe Duca]	2002

#### Positions/Employment

##### Current

University of Minnesota, Twin Cities  
School of Public Health  
Assistant Professor  
2011 – present

##### Previous

University of Minnesota, Twin Cities  
Masonic Cancer Center  
Research Associate  
Postdoctoral Associate  
2005 – 2011  
2003 – 2005

Moldova State University, Chisinau, Moldova  
Senior Lecturer  
Research Fellow  
Junior Scientist  
2000 – 2003  
1999 – 2003  
1998 – 1999

State University of Medicine, Chisinau, Moldova  
Laboratory Assistant  
1990 – 1991

#### Current Membership in Professional Organizations

Society for Research on Nicotine and Tobacco  
American Association for Cancer Research  
American Chemical Society  
2011 – present  
2006 – present  
2006 – present

## **HONORS AND AWARDS FOR RESEARCH/CREATIVE WORK, TEACHING, PUBLIC ENGAGEMENT, AND SERVICE**

### ***University of Minnesota***

Delta Omega Honorary Society in Public Health, Pi Chapter (2013)

Masonic Scholar, Minnesota Masonic Charities (2011)

Transdisciplinary Tobacco Use Research Center Trainee, University of Minnesota (2005-2007)

### ***External Sources***

Early Career Reviewer Program at the Center for Scientific Review, NIH (2012)

Research Travel Fellowship for Young Investigators, U.S. Civilian Research and Development Foundation and Moldovan Research and Development Association (2003)

State Prize for Young Investigators in the Field of Science and Technology, the Government of Moldova (2002)

Research Travel Award for Young Investigators, American Chemical Society-Central European Environmental Chemistry Program (2001)

## **RESEARCH, SCHOLARSHIP, AND CREATIVE WORK**

### **Grants and Contracts**

#### **External Sources (federal or state grants, foundation awards, etc.)**

##### ***Received at the University of Minnesota:***

##### Current

Principal Investigator

PI: Irina Stepanov

NIH/NCI R01 CA-179246

Constituent Yields and Biomarkers of Exposure for Tobacco Product Regulation

09/02/13 – 08/31/18

Total direct costs: \$1,399,410

Co-Investigator

PI: Dorothy Hatsukami and Peter Shields

NIH/NCI U19 CA157345

Models for tobacco product evaluation

Subaward: Animal models for assessing the relative abuse liability of tobacco products

09/20/2012 – 08/31/2017

Total direct costs: \$970,777

Co-Project Leader

PI: Stephen Hecht

NIH/NCI P01 CA-138338-01

Mechanisms of Ethnic/Racial Differences in Lung Cancer Due to Cigarette Smoking

Project 5: Metabolism of NNK among African-Americans

12/01/09 – 11/30/14

Total direct costs: \$8,079,168

Co-Investigator  
PIs: Dorothy Hatsukami and Jian-Min Yuan  
NIH/NCI R01-CA122244-01  
Randomized Trial of PEITC as a Modifier of NNK Metabolism in Smokers  
04/01/08 – 01/31/14  
Total direct costs: \$1,977,713

Co-Investigator  
PI: Stephen Hecht  
NIH/NCI 3 R37 CA081301-14  
Metabolism of Carcinogenic Tobacco-Specific Nitrosamines  
09/01/12 – 02/28/14  
Direct costs: \$375,000

Completed

Co-Investigator  
PI: Dorothy Hatsukami  
NIH/NCI HHSN261201200392P (contract)  
Global Tobacco Control and Prevention Network  
09/17/12 – 09/16/13  
Direct costs: \$50,000

Co-Investigator  
PI: Dorothy Hatsukami  
NIH/NCI HHSN261201100513P (contract)  
Tobacco Research and Monitoring Network  
09/01/11 – 08/31/12  
Direct costs: \$50,000

Co-Investigator  
PI: Dorothy Hatsukami  
NIH/NCI R01CA141531 (NIH/NCI)  
Novel Determinants and Measures of Smokeless Tobacco Use  
Administrative supplement: Tobacco Constituent Analysis of Novel Tobacco Products  
09/01/10 - 08/31/11  
Direct costs: \$132,439

Co-Investigator  
PI: Dorothy Hatsukami  
NIH/NCI HHSN261201000544P (contract)  
Tobacco Research and Monitoring Network  
09/01/10 – 08/31/11  
Direct costs: \$50,000

## University Sources

### Current

Co-Investigator

PI: Deborah Ferrington

Academic Health Center / Faculty Research Development Grant Program (FRD #11.22)

Characterizing Mitochondrial DNA Damage in Age-Related Macular Degeneration

01/01/12 – 12/31/13

Direct costs: \$199,927

Co-Investigator

PIs: Michael Georgieff, Patricia McGovern

Consortium on Law, Values and the Health Sciences, University of Minnesota

Creating Evidence-based Public Health Guidance for Manganese Levels in Water

07/01/13 - 06/30/14

Direct costs: \$30,000

## Publications

### *Refereed Journal Articles*

**NOTE:** In basic bio-medical research, both first and last authors are ranked as major contributors. The last author is usually the driving force, intellectually and often financially, behind the study.

1. **Stepanov I.**, Muzic, J., Le, C.T., Sebero, E., Jensen J., Hatsukami D.K., Hecht S.S. (2013) Analysis of 4-hydroxy-1-(3-pyridyl)-1-butanone (HPB)-releasing DNA adducts in human exfoliated oral mucosa cells by liquid chromatography-electrospray ionization-tandem mass spectrometry. *Chemical Research in Toxicology* 26:37–45. [dx.doi.org/10.1021/tx300282k](https://doi.org/10.1021/tx300282k)  
[Developed methodology, supervised laboratory analyses, analyzed data, and wrote manuscript]
2. Balbo S., James-Yi S., Johnson C.S., O’Sullivan M.G., **Stepanov I.**, Wang M., Bandyopadhyay D., Kassie F., Carmella S., Upadhyaya P., Hecht S.S. (2013) (S)-N'-Nitrosornicotine, a constituent of smokeless tobacco, is a powerful oral cavity carcinogen in rats. *Carcinogenesis* 34(9):2178-2183 doi:10.1093/carcin/bgt162  
[Supervised laboratory work to generate data, contributed to manuscript writing]
3. Biener L., Nyman, A.L., **Stepanov I.**, Hatsukami D. Public Education about Relative Harm of Tobacco Products: An intervention for tobacco control professionals. *Tobacco Control*, Online First: 10.1136/tobaccocontrol-2012-050814  
[Supervised laboratory analyses, participated in the development of educational materials, contributed to manuscript preparation]
4. **Stepanov I.**, Yershova K., Carmella S., Upadhyaya P., Hecht S.S. (2013) Levels of (S)-N'-nitrosornicotine in U.S. tobacco products. *Nicotine & Tobacco Research*, 15(7):1305-1310 doi:10.1093/ntr/nts249  
[Supervised laboratory analyses, wrote manuscript]

5. Zhu, A.Z.X., Binnington, M.J., Renner C.C., Lanier A.P., Hatsukami D.K., Stepanov I., Watson C.H., Sosnoff C.S., Benowitz, N.L., Tyndale R.F. (2013) Southwestern Alaska Native light smokers and smokeless tobacco users with slower CYP2A6 activity have lower tobacco consumption and lower urinary NNAL. *Carcinogenesis* 34(1):93–101. doi: 10.1093/carcin/bgs306  
[Generated data, contributed to manuscript writing]
6. Knezevich A., Muzic, J., Hatsukami D.K., Hecht S.S., **Stepanov I.** (2013) Nornicotine nitrosation in saliva and its relation to endogenous synthesis of *N*-nitrosornicotine in humans. *Nicotine & Tobacco Research*, 15(2):591-595. doi: 10.1093/ntr/nts172  
[Designed and supervised study, analyzed data and wrote manuscript]
7. Khariwala S.S., Carmella S.G., **Stepanov I.**, Fernandes P., Lassig A.A., Yueh B., Hatsukami D., Hecht S.S. (2012) Elevated levels of 1-hydroxypyrene and *N*<sup>7</sup>-nitrosornicotine in smokers with head and neck cancer: A matched control study. *Head & Neck*, Early view advance publication: DOI 10.1002/hed.23085  
[Generated data, contributed to manuscript writing]
8. Hecht S.S., Murphy S.E., **Stepanov I.**, Nelson H.H., Yuan J.M. (2012) Tobacco smoke biomarkers and cancer risk among male smokers in the Shanghai Cohort Study. *Cancer Letters*, Advance publication: <http://dx.doi.org/10.1016/j.canlet.2012.07.016>  
[Supervised laboratory analyses to generate data, contributed to manuscript writing]
9. Benowitz N.L., Renner C.C., Lanier A.P., Tyndale R.F., Hatsukami D.K., Lindgren B., **Stepanov I.**, Watson C.H., Sosnoff C.S., Jacob P. (2012) Exposure to Nicotine and Carcinogens among South Western Alaskan Native Cigarette Smokers and Smokeless Tobacco Users. *Cancer Epidemiology, Biomarkers & Prevention*, 21(6):934-942, doi:10.1158/1055-9965.EPI-11-1178.  
[Supervised laboratory analyses, summarized data, contributed to manuscript writing]
10. **Stepanov I.**, Jensen J., Biener L., Bliss R.L., Hecht S.S., Hatsukami D.K. (2012) Increased pouch sizes and resulting changes in the amounts of nicotine and tobacco-specific *N*-nitrosamines in single pouches of Camel Snus and Marlboro Snus. *Nicotine & Tobacco Research*, Advance Access, doi: 10.1093/ntr/ntr292  
[Generated and analyzed data, wrote manuscript]
11. Harris A.G., **Stepanov I.**, Pentel P., LeSage M.G. (2012) Delivery of nicotine in an extract of a smokeless tobacco product reduces its reinforcement-attenuating and discriminative stimulus effects in rats. *Psychopharmacology* 220:565-576.  
[Supervised laboratory analyses to generate data, contributed to manuscript writing]
12. **Stepanov I.**, Biener L., Knezevich A., Nyman A.L., Bliss R., Jensen J., Hecht S.S., Hatsukami D.K. (2012) Monitoring tobacco-specific *N*-nitrosamines and nicotine in novel Marlboro and Camel smokeless tobacco products: findings from Round 1 of the New Product Watch. *Nicotine & Tobacco Research* 14(3):274-281.  
[Participated in study design, supervised laboratory analyses, summarized data, wrote manuscript]
13. **Stepanov I.**, Knezevich A., Zhang L., Watson C.H., Hatsukami D.K., Hecht S.S. (2012) Carcinogenic tobacco-specific *N*-nitrosamines in US cigarettes: three decades of remarkable neglect by the tobacco industry. *Tobacco Control* 21:44-48.  
[Designed and supervised study, analyzed data and wrote manuscript]

14. Yuan J. M., Knezevich A. D., Wang R., Gao Y. T., Hecht S.S., **Stepanov I.** (2011) Urinary levels of the tobacco-specific carcinogen *N*'-nitrosonornicotine and its glucuronide are strongly associated with esophageal cancer risk in smokers. *Carcinogenesis*, 32(9):1366-1371.  
[Contributed to study design, supervised laboratory analyses to generate data, contributed to manuscript writing]
15. Vogel R.I., Carmella S.G., **Stepanov I.**, Hatsukami D.K., Hecht S.S. (2011). The ratio of a urinary tobacco-specific lung carcinogen metabolite to cotinine is significantly higher in passive than in active smokers. *Biomarkers*, 16(6):491-497.  
[Contributed to data generation, analysis, and manuscript preparation]
16. Kotlyar M., Hertsgaard L.A., Lindgren B.R., Jensen J.A., Carmella S.G., **Stepanov I.**, Murphy S.E., Hecht S.S., Hatsukami D.K. (2011). Effect of oral snus and medicinal nicotine in smokers on toxicant exposure and withdrawal symptoms: a feasibility study. *Cancer Epidemiology, Biomarkers & Prevention*, 20(1):91-100.  
[Conducted laboratory analyses, contributed to manuscript preparation]
17. Hecht S.S., **Stepanov I.**, Hatsukami D.K. (2011). Major tobacco companies have technology to reduce carcinogen levels but do not apply it to popular smokeless tobacco products. *Tobacco Control*, 20(6):443.  
[Conducted laboratory analyses, contributed to manuscript preparation]
18. Hatsukami D.K., Kotlyar M., Hertsgaard L.A., Zhang Y., Carmella S.G., Jensen J.A., Allen S.S., Shields P.G., Murphy S.E., **Stepanov I.**, Hecht S.S. (2010) Reduced nicotine content cigarettes: effects on toxicant exposure, dependence and cessation. *Addiction*, 105:343-355.  
[Conducted laboratory analyses, contributed to manuscript preparation]
19. **Stepanov I.**, Villalta P.W., Knezevich A., Jensen J., Hatsukami D., Hecht S.S. (2009). Analysis of 23 Polycyclic Aromatic Hydrocarbons in Smokeless Tobacco by Gas Chromatography-Mass Spectrometry. *Chemical Research in Toxicology*, 23:66-73.  
[Developed methodology, conducted laboratory analyses, wrote manuscript]
20. **Stepanov I.**, Carmella S.G., Briggs A., Hertsgaard L., Lindgren B., Hatsukami D., Hecht S.S. (2009). Presence of the carcinogen *N*'-nitrosonornicotine in the urine of some users of oral nicotine replacement therapy products. *Cancer Research*, 69(21):8236-8240. PMID: PMC2783463  
[Designed and conducted study, analyzed data and wrote manuscript]
21. **Stepanov I.**, Hecht S.S. (2009) Mitochondrial DNA adducts in the lung and liver of F344 rats chronically treated with 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone and (S)-4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol. *Chemical Research in Toxicology*, 22(2):406-414. PMID: PMC2664261  
[Developed methodology, conducted laboratory analyses, analyzed data and wrote manuscript]
22. **Stepanov I.**, Carmella S.G., Han S., Pinto A., Strasser A.A., Lerman C., Hecht S.S. (2009) Evidence for endogenous formation of *N*'-nitrosonornicotine in some long term nicotine patch users. *Nicotine and Tobacco Research*, 11(1):99-105. PMID: PMC2734288  
[Conducted laboratory analyses, analyzed data, wrote manuscript]

23. **Stepanov I.**, Hecht S.S. (2008) Detection and Quantitation of *N*-Nitrosornicotine in Human Toenails by Liquid Chromatography-Electrospray Ionization-Tandem Mass Spectrometry. *Cancer Epidemiology, Biomarkers & Prevention*, 17(4):945-948.  
[Developed methodology, conducted laboratory analyses, wrote manuscript]
24. Hecht S.S., Carmella S.G., Edmonds A., Murphy S.E., **Stepanov I.**, Luo X., Hatsukami D.K. (2008) Exposure to nicotine and a tobacco-specific carcinogen increase with duration of use of smokeless tobacco. *Tobacco Control*, 17:128-131  
[Contributed to data generation and manuscript preparation]
25. Hecht S.S., Carmella S.G., **Stepanov I.S.**, Jensen, J., Hatsukami, D.K. (2008) Metabolism of the tobacco-specific carcinogen 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone to its biomarker total NNAL in smokeless tobacco users. *Cancer Epidemiology, Biomarkers & Prevention*, 17(3):732-735.  
[Contributed to data generation and analysis, and to manuscript preparation]
26. **Stepanov I.**, Jensen J., Hatsukami D., Hecht S.S. (2008) New and traditional smokeless tobacco: comparison of toxicant and carcinogen levels. *Nicotine and Tobacco Research*, 10(12):1773-1782.  
[Conducted laboratory analyses, analyzed data, wrote manuscript]
27. **Stepanov I.**, Upadhyaya P., Feuer R., Jensen J., Hatsukami D.K., Hecht S.S. (2008) Extensive metabolic activation of the tobacco-specific carcinogen 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone in smokers. *Cancer Epidemiology, Biomarkers & Prevention*, 17(7):1764-1773. PMID: PMC2542896  
[Designed and conducted study, generated and analyzed data, and wrote manuscript]
28. Hatsukami D.K., Ebbert J.O., Feuer R.M., **Stepanov I.**, Hecht S.S. (2007) Changing smokeless tobacco products: new tobacco-delivery systems. *American Journal of Preventive Medicine*, 33(6S):S368-S378.  
[Generated some analytical data]
29. Porubin D., Hecht S.S., Li Z., Gonta M., **Stepanov I.** (2007) Endogenous formation of *N*'-nitrosornicotine in F344 rats in the presence of some antioxidants and grape seed extract. *Journal of Agricultural and Food Chemistry*, 55(17):7199-7204.  
[Designed study, supervised its implementation, analyzed data, and wrote manuscript]
30. **Stepanov I.**, Hecht S.S., Lindgren B., Peyton J. III, Wilson M., Benowitz N.L. (2007) Relationship of human toenail nicotine, cotinine, and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol to levels of these biomarkers in plasma and urine. *Cancer Epidemiology, Biomarkers & Prevention*, 16(7):1382-1386.  
[Conducted laboratory analyses, analyzed data, wrote manuscript]
31. **Stepanov I.**, Feuer R., Jensen J., Hatsukami D., Hecht S.S. (2006) Mass spectrometric quantitation of nicotine, cotinine, and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol, in human toenails. *Cancer Epidemiology, Biomarkers & Prevention*, 15(12):2378-2383.  
[Developed methodology, conducted laboratory analyses, analyzed data, wrote manuscript]
32. **Stepanov I.**, Jensen J., Hatsukami D., Hecht S.S. (2006) Tobacco-specific nitrosamines in new tobacco products. *Nicotine and Tobacco Research*, 8(2):309-313.  
[Conducted laboratory analyses, analyzed data, wrote manuscript]

33. **Stepanov I.**, Hecht S.S., Duca Gh., Mardari I. (2006) Uptake of the tobacco-specific lung carcinogen 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) by Moldovan children. *Cancer Epidemiology, Biomarkers & Prevention*, 14(4):885-891  
[Designed study, supervised its implementation, generated and analyzed data, and wrote manuscript]
34. **Stepanov I.**, Hecht S.S., Ramakrishnan S., Gupta P.C. (2005) Tobacco-specific nitrosamines in smokeless tobacco products marketed in India. *International Journal of Cancer*, 116(1):16-19.  
[Supervised laboratory analyses, analyzed data, wrote manuscript]
35. **Stepanov I.**, Hecht S.S., Mirvish S.S., Gonta M. (2005) Comparative analysis of tobacco-specific nitrosamines and total N-nitroso compounds in Moldovan cigarette tobacco. *Journal of Agricultural and Food Chemistry*, 53:8082-8086.  
[Designed and conducted study, generated and analyzed data, and wrote manuscript]
36. **Stepanov I.**, Hecht S.S. (2005) Tobacco-specific nitrosamines and their pyridine-N-glucuronides in the urine of smokers and smokeless tobacco users. *Cancer Epidemiology, Biomarkers & Prevention*, 14(4):885-891.  
[Developed methodology, conducted laboratory analyses, analyzed data, wrote manuscript]
37. **Stepanov I.**, Carmella S.G., Hecht S.S., Duca Gh. (2002) Analysis of tobacco-specific nitrosamines in Moldovan cigarette tobacco. *Journal of Agricultural and Food Chemistry*, 50(10):2793-2797.  
[Conducted laboratory analyses, analyzed data, contributed to manuscript preparation]

#### ***Non-refereed Journal Articles or Book Chapters***

None

#### **Publications in press or review**

##### ***Books or book chapters***

1. Stanfill S., **Stepanov I.** Chapter 3: Global View of Smokeless Tobacco Products: Constituents and Toxicity. In: Global Report on Smokeless Tobacco. *National Cancer Institute and Centers for Disease Control and Prevention*, in press.  
[Researched literature, co-wrote chapter, reviewed final draft]

##### ***Manuscripts***

1. **Stepanov I.**, Sebero E., Wang R., Gao Y., Hecht S.S., Yuan J.M. Tobacco-specific N-nitrosamine exposures and cancer risk in Shanghai Cohort Study: A remarkable coherence with the laboratory animal data. *International Journal of Cancer*, in press  
[Supervised laboratory analyses, wrote manuscript]
2. **Stepanov I.**, Soeteman-Hernández L.G., Talhout R. Research and monitoring the evolution of new tobacco products, including products with potentially “modified risks”. Background paper for the 7<sup>th</sup> Meeting of the WHO Study Group on Tobacco Product Regulation (contracted by the WHO). In review.  
[Researched literature, co-wrote, merged and submitted final draft]



## **Presentations, Posters, and Exhibits**

### ***Invited Presentations at Professional Meetings, Conferences, etc.***

**Stepanov, I.** Building a Global Tobacco Product Surveillance Network. International Conference on Public Health Priorities in the 21st Century: The Endgame For Tobacco. New Delhi, India, September 9-12, 2013.

**Stepanov, I.** Analysis of TSNAs in Cigarette Filler and Smokeless Tobacco. Tobacco Product Analysis Workshop: FDA, Center for Tobacco Products, Washington, DC, July 30-31, 2013.

**Stepanov, I.** Toxic and carcinogenic constituents in U.S. smokeless tobacco products. Healis - Sekhsaria Institute for Public Health, Mumbai, India, March 21, 2013.

**Stepanov, I., Biener L.** Resources and Infrastructure for Collaboration. Presentation at the World Conference on Tobacco or Health. Workshop: Accelerating Global Research and Collaboration on Smokeless Tobacco. Singapore, March 19-24, 2012.

**Stepanov, I.** Toxic and carcinogenic constituents in dissolvable tobacco products. Presentation to the Food and Drug Administration, Tobacco Product Scientific Advisory Committee meeting. Washington, DC, January 18-20, 2012.

**Stepanov, I.** Tobacco Monitoring and Research Network: Snus Database. International Smokeless Tobacco Meeting. Atlanta, Georgia, December 8-9, 2010.

### ***Internal Seminars – University of Minnesota (presented by I. Stepanov)***

Non-Combustible Tobacco: Diversity of Products, Research Needs, and Opportunities for Cancer Prevention. Cancer Prevention and Control Seminar, November 11, 2013

Randomized trial of PEITC as a modifier of NNK metabolism in smokers. Masonic Cancer Center, University of Minnesota Cancer Prevention and Control Fall Retreat “Translational Science: Lung Cancer as a Model. October 12, 2012

Toxic and carcinogenic constituents in smokeless tobacco products. Tobacco Studies Group Seminar. September 4, 2012

Randomized trial of PEITC as a modifier of NNK metabolism in smokers: Project status update. Minnesota Chemoprevention Consortium Meeting. December 7, 2011

Toxicants and carcinogens in smokeless tobacco: Beyond nicotine and nitrosamines. Transdisciplinary Tobacco Use Research Center Lectures. January 9, 2009.

Relationship of human toenail nicotine, cotinine, and 4 (methylnitrosamino)-1-(3-pyridyl)-1-butanol to levels of these biomarkers in plasma and urine. 2007 Cancer Center Spring Poster Session and Symposium. May 16, 2007.

Tobacco-Specific N-Nitrosamines: Occurrence and Biomarker Applications. Cancer Center Carcinogenesis and Chemoprevention Program Meeting. June 9, 2005.

### ***Abstracts Presented at Professional Meetings, Conferences, etc. (presented by I. Stepanov unless indicated otherwise)***

Ma, B., Villalta, P.W., **Stepanov, I.** Analysis of malondialdehyde-deoxyguanosine adduct in human leukocyte DNA by liquid chromatography nanoelectrospray-high resolution

tandem mass spectrometry. 246<sup>th</sup> American Chemical Society National Meeting, Indianapolis, IN, September 8-12, 2013. *Presented by B. Ma.*

Villalta, P.W., Flynn, E., Hecht, S.S., **Stepanov, I.** Analysis of 4-hydroxy-1-(3-pyridyl)-1-butanone-releasing adducts in human DNA by high resolution tandem mass spectrometry. 244<sup>th</sup> American Chemical Society National Meeting, Philadelphia, PA, August 19-23, 2012. *Presented by P. Villalta.*

Wang, Y., **Stepanov, I.**, Hecht, S.S. Analysis of 4-hydroxy-4-(3-pyridyl)-butanoic acid in smokers urine by liquid chromatography-electrospray ionization-tandem mass spectrometry. 244<sup>th</sup> American Chemical Society National Meeting, Philadelphia, PA, August 19-23, 2012. *Presented by M. Jing.*

Hecht, S.S., James-Yi, S., O'Sullivan, G., **Stepanov, I.**, Wang, M., Zhang, S., Kassie, F., Carmella, S.G., Upadhyaya, P., Balbo, S. DNA binding of the smokeless tobacco constituent (*S*)-*N'*-nitrosornicotine [(*S*)-NNN] predicts its oral cavity carcinogenicity in rats. 244<sup>th</sup> American Chemical Society National Meeting, Philadelphia, PA, August 19-23, 2012. *Presented by S. Balbo.*

Knezevich, A., Yuan, J.M., Carmella, S.G., Hatsukami, D.K., Hecht, S.S., **Stepanov, I.** Evaluation of toxicant exposure in U.S. smokers after short-term switching to commercial low-nitrosamine cigarettes. American Association for Cancer Research Annual Meeting 2012, Chicago, IL, March 31 – April 4, 2012. *Presented by A. Knezevich.*

Balbo, S., James-Yi, S., O'Sullivan, G., **Stepanov, I.**, Wang, M., Kassie, F., Carmella, S., Upadhyaya, P., Wettlaufer, C., Knezevich, A., Hecht, S.S. (*S*)-*N'*-Nitrosornicotine, a constituent of smokeless tobacco, is a potent oral tumorigen in rats.. American Association for Cancer Research Annual Meeting 2012, Chicago, IL, March 31 – April 4, 2012. *Presented by S. Balbo.*

**Stepanov, I.** Tobacco carcinogen exposure and cancer risk: Application of biomarkers. V International Conference-Symposium on Ecological Chemistry, Chisinau, Moldova, March 2-3, 2012.

**Stepanov, I.**, Knezevich, A., Zhang, L., Watson, C., Hatsukami, D.K., Hecht, S.S. Carcinogenic nitrosamines in U.S. cigarettes: Three decades of remarkable neglect by the tobacco industry. 242<sup>nd</sup> American Chemical Society National Meeting, Denver, CO, August 28 – September 1, 2011.

**Stepanov, I.**, Knezevich, A., Muzic, J., Hatsukami, D., Hecht, S.S. Nornicotine nitrosation in human saliva and its relation to endogenous formation of *N'*-nitrosornicotine in oral nicotine replacement therapy users. American Association for Cancer Research Annual Meeting 2011, Orlando, FL, April 2-6, 2011.

Yuan, J.M., Knezevich, A., Wang, R., Gao, Y.T., Hecht, S.S., **Stepanov, I.** Urinary levels of the tobacco-specific carcinogen *N'*-nitrosornicotine and its glucuronide are strongly associated with esophageal cancer risk in smokers in the Shanghai Cohort Study. American Association for Cancer Research Annual Meeting 2011, Orlando, FL, April 2-6, 2011. *Presented by Y. M. Yuan.*

**Stepanov, I.**, Muzic, J., Jensen, J., Hatsukami, D., Hecht, S.S. Analysis of 4-hydroxy-1-(3-pyridyl)-1-butanone-releasing DNA adducts in human exfoliated oral mucosa cells by liquid chromatography-electrospray ionization-tandem mass spectrometry. 240<sup>th</sup> American Chemical Society National Meeting, Boston, MA, August 22-26, 2010.

**Stepanov, I.**, Villalta, P.W., Knezevich, A., Jensen, J., Hatsukami, D., Hecht, S.S. Analysis of 21 polycyclic aromatic hydrocarbons in smokeless tobacco by gas chromatography-mass spectrometry. 238<sup>th</sup> American Chemical Society National Meeting, Washington, DC, August 16-20, 2009.

Hecht, S.S., Wang, M., Upadhyaya P., **Stepanov, I.**, Lao, Y., Villalta, P.W., Hatsukami, D.K., Carmella, S.G. Tobacco carcinogen biomarkers for investigating tobacco and cancer. 238<sup>th</sup> American Chemical Society National Meeting, Washington, DC, August 16-20, 2009. *Presented by S. Hecht.*

**Stepanov, I.**, Hecht, S.S. Mitochondrial DNA adducts in the lung and liver of F344 rats chronically treated with 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone and (S)-4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol. American Association for Cancer Research Annual Meeting 2009, Denver, CO, April 18-22, 2009.

**Stepanov, I.**, Carmella, S.G., Briggs, A., Hertsgaard, L., Hatsukami, D., Hecht, S.S. Endogenous formation of the carcinogen *N'*-nitrosornicotine in users of oral nicotine replacement therapy products. American Association for Cancer Research Annual Meeting 2009, Denver, CO, April 18-22, 2009.

**Stepanov I.**, Upadhyaya, P., Feuer, R., Jensen, J., Hatsukami, D.K., Hecht, S.S. Extensive metabolic activation of the tobacco-specific carcinogen 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone in smokers. American Association for Cancer Research Annual Meeting 2008, San Diego, CA, April 12-16, 2008.

**Stepanov, I.**, Hecht, S.S. Detection and quantitation of *N'*-nitrosornicotine in human toenails by liquid chromatography-electrospray ionization-tandem mass spectrometry. 2007 AACR International Conference on Frontiers in Cancer Prevention Research, Philadelphia, PA, December 5-8, 2007.

**Stepanov, I.**, Lindgren, B., Hecht, S.S., Benowitz, N., Peyton, J.III, and Wilson, M. Relationship of human toenail nicotine, cotinine, and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol to levels of these biomarkers in urine and plasma. Chemistry in Cancer Research: A Vital Partnership, San Diego, CA. February 4-7, 2007.

**Stepanov, I.**, Jensen, J., Hatsukami, D., Hecht, S.S. Metabolites of Nicotine and a Tobacco-Specific Nitrosamine, 4-(Methylnitrosamino)-1-(3-Pyridyl)-1-Butanone, in Human Toenails, 97<sup>th</sup> American Association for Cancer Research Annual meeting, Washington, DC. April 1-2, 2006.

Hecht, S.S., Upadhyaya, P., Wang, M., **Stepanov, I.**, Lao, Y., Villalta, P.W., Carmella, S.G. Tobacco carcinogen biomarkers: Development and application. 232<sup>nd</sup> American Chemical Society National Meeting, San Francisco, CA, September 10-14, 2006. *Presented by S. Hecht.*

**Stepanov, I.**, Hecht, S.S. Tobacco-specific Nitrosamines and Their Pyridine-*N*-Glucuronides in the Urine of Smokers and Smokeless Tobacco Users, 96<sup>th</sup> American Association in Cancer Research Annual meeting, Anaheim, CA. April 16-20, 2005.

### **Other Key Activities and Accomplishments**

1. Spring 2013 – Development of a Global Tobacco Network (supported by a contract from the National Cancer Institute, NIH).

*Collaboration with Healis - Sekhsaria Institute for Public Health, Mumbai, India. Travelled to Mumbai to develop a standard protocol for acquiring and analyzing smokeless tobacco samples.*

2. December 2012-March 2013: Consultant, “Chemistry of Tobacco Products” and “Tobacco Pharmacology and Toxicology”, slide decks developed for the Food and Drug Administration, Center for Tobacco Products. BHL Technologies, Rockville, MD.
3. Spring 2012 – Travelled to the Republic of Moldova to establish contacts with scientists involved in public health research and to explore opportunities for collaboration.

*Grant supported by the European Union/International Organization for Migration.*

4. Since 2011 – Principal Investigator for the pilot clinical trial entitled “HBP-Releasing DNA Adducts in the Oral Cavity Cells of Patients with Lung Cancer”

*A nonrandomized case-control study to compare the levels of DNA adducts derived from a tobacco-specific carcinogen between smokers with lung cancer and healthy smokers.*

5. Invited participant for the expert workshop “What Makes A Cigarette A Cigarette” organized by the trans-NIH Tobacco and Nicotine Research Interest Group. Rockville, MD, September 23, 2010.
6. Since 2009 – Maintaining a web-based tobacco product database.

*The database is part of the Tobacco Monitoring and Research Network, a nation-wide group of experts in tobacco surveillance, control policies, addiction, and carcinogenesis.*

## **TEACHING AND CURRICULUM DEVELOPMENT**

### **University of Minnesota**

Courses, seminars, and instructional units taught

PubH 6100: Topics course: Biomarkers in Public Health Research (Spring 2013)

PubH 6140: Occupational and Environmental Epidemiology – one lecture (Spring 2013)

PubH 6112: Risk Analysis: Application to Risk- Based Decision Making – one lecture (Spring 2012)

Curriculum Development

PubH 6100: Topics course: Biomarkers in Public Health Research – developed a new course

Collaborative Efforts and Activities

None

Faculty Development Activities regarding teaching

Early Career Teaching Program, Center for Teaching and Learning, University of Minnesota (2013-2014 academic year).

“Designing Courses to Support Student Learning and Teacher Satisfaction”, series of workshops at the Center for Teaching and Learning, University of Minnesota (Fall 2011)

## **Moldova State University**

### Courses, seminars, and instructional units taught

Basics of Ecology (Fall 2000 – Spring 2001)

Metrology and Standardization (Fall 2000 – Spring 2001)

Ecotoxicology (Spring 2002 – Spring 2003)

Chemical Control of Cosmetics and Pharmaceuticals (Spring 2002 – Spring 2003)

### Curriculum Development

Basics of Ecology (course, seminars)

Metrology and Standardization (course, seminars, laboratories)

Ecotoxicology (course, seminars)

Chemical Control of Cosmetics and Pharmaceuticals (course, seminars, laboratories)

### Collaborative Efforts and Activities

None

### Faculty Development Activities regarding teaching

None

## **Other teaching activities**

Invited panelist for the Data to Action Workshop, International Conference on Public Health Priorities in the 21st Century: The Endgame For Tobacco. New Delhi, India, September 10, 2013

Guest speaker at a career development workshop with the 2013 Cancer and Health Disparities Summer Internship Program, University of Minnesota, July 22, 2013.

Application of biomarkers in public health research. M.S./Ph.D. Program Seminar at the University of the Moldovan Academy of Sciences, Chisinau, Moldova, March 2012.

Application of biomarkers in public health research. M.S./Ph.D. Program Seminar at Moldova State University, Chisinau, Moldova, March 2012.

## **ADVISING AND MENTORING**

### **Undergraduate Student Activities**

Undergraduate research projects (UROPS, directed research, lab participation, etc.)

John Muzic (Directed research)

Ryan Baumgartner (Directed research)

Brad Lieberman (Summer student)

David Wen (Summer student)

Undergraduate summa theses or honors projects directed

None

Undergraduate advising

None

## **Graduate Student Activities**

Master's Theses Directed  
Kriti Choudhary (MPH)

Master's Student Advisees  
Olaoluwa Lediju (MPH)  
Fadume Ashiro (MPH)  
Kriti Choudhary (MPH)  
Ning Lee (MS)  
Margarita Omeonu (MPH)

Doctoral Dissertations Directed  
None

Doctoral Students Advised (Academic advising for all or part of graduate student's program)  
Yan Zhong (Rotation supervisor)

Doctoral Committees Served on  
None

## **Post-doctoral fellows supervised**

Vipin Jain (September 2013 – Present)  
Meng Jing (June 2012 – Present)  
Bin Ma (June 2012 – Present)  
Yaohua Wang (September 2010 – February 2012)

## **Other Mentoring Activities**

Masonic Cancer Center, University of Minnesota – 11 junior scientists supervised (2005-2012)  
Moldova State University – 17 students advised (2001-2003)

## **SERVICE AND PUBLIC OUTREACH**

### **Service To The Discipline/Profession/Interdisciplinary Area(s)**

#### *Editorships/Journal Reviewer Experience*

Reviewer experience

Mutation Research, since 2013  
Addiction, since 2013  
Journal of Environmental Research and Public Health, since 2013  
Analytical methods, since 2013  
Chemistry Central Journal, since 2013  
Food and Chemical Toxicology, since 2013  
Analytical Chemistry, since 2013  
Journal of Agricultural and Food Chemistry, since 2012  
Cancer Epidemiology Biomarkers & Prevention, since 2012

Environmental Toxicology, since 2012  
Current Biomarker Findings, since 2012  
Chemical Research in Toxicology, since 2011  
International Journal of General Medicine, since 2010  
BMC Public Health, since 2010  
Tobacco Control, since 2010  
Regulatory Toxicology and Pharmacology, since 2009  
Human & Experimental Toxicology, since 2008  
Environmental Science & Technology, since 2007  
Nicotine & Tobacco Research, since 2007  
Journal of Chromatography B, since 2007

***Committee memberships***

Communications Committee, Division of Chemical Toxicology, American Chemical Society (since 2011).

Professional Development Committee, Division of Chemical Toxicology, American Chemical Society (since 2009).

***Review panels for external funding agencies, foundations, etc.***

Expert review of a book proposal "Tobacco Smoke Biomarkers", CRC Press and Taylor & Francis Asia Pacific, November 2013

Grant reviewer for the Cancer Study Section, The Tobacco-Related Disease Research Program (TRDRP), University of California, April 2013

Grant reviewer for the Cancer Research UK Tobacco Advisory Group, London, UK, March 2013

Expert review of a chapter for the monograph "Smokeless Tobacco and Public Health in India", to be published by the Public Health Foundation of India, the WHO South-East Asia Region, and CDC. December 2012.

Grant reviewer for The City College of New York/Memorial Sloan-Kettering Cancer Center Cancer Center Partnership, March 2011.

***Program review experience***

None

***Judging work of others***

Poster judge at the 244th American Chemical Society National Meeting, Philadelphia, PA, August 19-23, 2012.

Poster judge at the 240th American Chemical Society National Meeting, Boston, MA, August 22-26, 2010.

***Organization of conferences, workshops, panels, symposia***

Session Chair, V International Conference-Symposium on Ecological Chemistry, Chisinau, Moldova, March 2-3, 2012.

Session Chair, Division of Chemical Toxicology, 238th American Chemical Society National Meeting, Washington, DC, August 16-20, 2009.

Secretary, II International Conference on Ecological Chemistry, Chisinau, Moldova, October 11-12, 2002.

### **Service To The University/College/Department**

#### ***University of Minnesota***

University-wide service

None

Collegiate Service and Intercollegiate Service

Faculty Representative, School of Public Health, Recognition Awards and Honors (RAH) Committee, 2013

Judging Committee, School of Public Health Research Day, Spring 2013

Non-Tenured Faculty Representative, School of Public Health, Appointment Promotion and Tenure (APT) Ad Hoc Committee, 2012.

Department/Unit Service

Organizing Committee, Ph.D. program in Toxicology, University of Minnesota, 2013

Abstract review for the Masonic Cancer Center 2012 Research Symposium, Carcinogenesis and Chemoprevention Program, 2012

Member, Committee for bridge funding allocation for graduate students, Division of Environmental Health Sciences, 2012

Member, Strategic Planning Committee, Division of Environmental health Sciences, 2012

Member, Faculty Search Committee, Division of Environmental health Sciences, 2012, 2013

### **Public And Other Service**

Community, state, national, or international service activities

Minnesota Department of Health – assisted with the revision of Minnesota Tobacco Substance Reporting Form to collect data from tobacco manufacturers per Minnesota Statutes §461.17.

Biomarkers for Tobacco Carcinogenesis Studies. Masonic Cancer Center, Masonic Tour Program “Innovations in Cancer Research”. May 10, 2013

Minnesota State Fair: Discussed toxicity of tobacco products at the University of Minnesota, Tobacco Research Programs booth, August 24, 2012

Scientific Secretary, Journal “The Environment”, Chisinau, Moldova, 2003

United Nations Environmental Program (UNEP)-Moldova National Committee (2000-2002).