

**VERA SAMBUROVA, PH.D.**

Associate Research Professor  
Desert Research Institute  
Division of Atmospheric Sciences  
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**Education**

Desert Research Institute, Reno	Chemistry	Post.Doc.	2007-2008
Swiss Federal Institute of Technology, Zurich	Chemistry	Ph.D.	2007
Moscow State University, Moscow	Chemistry	M.S.	2002

**Professional Interests**

- Speciation and characterization of organic compounds in the atmosphere
- Developing of analytical methods for analysis of various organic species
- Comprehensive chemical characterization of biomass conversion product, biomass-burning and vehicle emissions, volatile organic compounds at cannabis grow facilities
- Analysis of organic compounds, including toxic species, in e-cigarette vapors

**Professional References**

Hans Moosmüller, Ph.D. ([Hans.Moosmuller@dri.edu](mailto:Hans.Moosmuller@dri.edu), phone: (775) 409-0020)  
Pat Arnott, Ph.D. ([arnottw@unr.edu](mailto:arnottw@unr.edu), phone: (775) 233-2601)  
Alexandra Lutz, Ph.D. ([Alexandra.Lutz@dri.edu](mailto:Alexandra.Lutz@dri.edu), phone: (775) 329-3637)

**Appointments**

2018 - present	Associate Research Professor, Desert Research Institute, Division of Atmospheric Sciences, Reno, NV
2018 - present	Program Director, Atmospheric Science Graduate Program, University of Nevada, Reno, NV; Desert Research Institute, Division of Atmospheric Sciences, Reno, NV
2008 - 2018	Assistant Research Professor, Desert Research Institute, Division of Atmospheric Sciences, Reno, NV
2007 - 2008	Postdoctoral Research Associate, Desert Research Institute, Division of Atmospheric Sciences, Reno, NV
2004 - 2007	Teacher assistant, Analytical organic chemistry, Swiss Federal Institute of Technology, Zurich, Switzerland
2002 - 2003	Teacher assistant, Inorganic chemistry, Swiss Federal Institute of Technology, Zurich, Switzerland
6/2002 – 6/2007	Swiss Federal Institute of Technology, Zurich (ETHZ), Switzerland; PhD project: Investigation of high molecular weight compounds in organic urban aerosols (Supervisor: Prof. Renato Zenobi)
1997 - 2002	Moscow State Lomonosov University (MSU), Russia Diploma project: Determination of lipopolysaccharides by thermal lens and spectrophotometric methods; Analytical Chemistry Department, Laboratory of Spectroscopy (Supervisor: Dr. Michail Proskurnin)

## Work Experience

2010 - Present	<b>Teaching.</b> Atmospheric Chemistry 412/612, University of Nevada, Reno, USA
2009 - Present	<b>Teaching.</b> Air Pollution 412/612, University of Nevada, Reno, USA
Spring 2013	<b>Teaching.</b> Air Quality Measurements and Data Analysis 792, University of Nevada, Reno, USA
Spring 2008	<b>Teaching.</b> Atmospheric Chemistry and Air Pollution Measurements 612/712, University of Nevada, Reno, USA
2003 - 2007	<b>Teaching.</b> Analytical chemistry (Liquid Chromatography), Swiss Federal Institute of Technology, Zurich (ETHZ), Switzerland
Oct.- Feb. 2004/05	Swiss Federal Institute of Technology, Zurich (ETHZ), Switzerland
Oct.- Feb. 2003/04	<b>Teaching.</b> Inorganic Chemistry, first semester
Jan. - May 2002	<b>Teaching.</b> Supervisor of two semester theses in Analytical Chemistry Department of Analytical Chemistry, Moscow State Lomonosov University (MSU), Russia
June - Sep. 2001	Exchange student in the group of Air Pollution / Environmental Technology at the Materials Science and Technology Academy, EMPA, Dübendorf, Switzerland. Acquired training in: HPLC, FTIR
May - July 2000	Summer practice. Sewage disposal plant, chemical analysis of water, Maloyaroslavets, Russia

## Awards

- 2017: The Peter B. Wagner Medal of Excellence Award for DRI Scholars in the Early Stages of Career Development
- 2018: The Nevada System of Higher Education (NSHE) Board of Regents Rising Researcher Award
- 2020: The winner of TOXICS 2020 Best Paper Award: Samburova, V. et al. (2018). Aldehydes in Exhaled Breath during E-Cigarette Vaping: Pilot Study Results, *Toxics*, 6 (3), 46, 10.3390/toxics6030046

## Analytical Capabilities and Skills

- MALDI-TOF mass spectrometry
- <sup>1</sup>H-NMR and C-NMR
- FTIR-spectroscopy
- Liquid chromatography mass spectrometry (UPLC-MS)
- ESI and APCI MS and MS/MS
- UV- spectroscopy
- Thermolens spectrometry
- Gas Chromatography Mass spectrometry (GC/MS)
- Thermal Desorption GC/MS
- Fourier Transform Ion Cyclotron Resonance Ultra High Resolution Mass Spectrometry (FT-ICR MS)
- Electron Microscopy

### Service to the Scientific Community

- June 2012 –2015. Chair of AB2 (Atmospheric Chemistry) section of the Air & Waste Management Association (AWMA, USA)
- August 2012 – June 2018. Associate Director for the Graduate Program in Atmospheric Sciences at UNR
- September 2009 – present time. Active member of laboratory safety committee at Desert Research Institute (Reno, Nevada)
- December 2011-2018. Secretary of the Eastern Sierra Chapter Air & Waste Management Association.
- 2002 – 2007 – member of Swiss Chemical Society (Switzerland)
- 2009 – present time. Chair of committee of Peter Wagner Memorial Award for Women in Atmospheric Sciences (USA).
  
- 2006 – present time. Reviewer:
  - Journal of Geophysical Research
  - Talanta
  - Atmospheric Science and Technology
  - Atmospheric Chemistry and Physics
  - Air Quality, Atmosphere and Health
  - Journal of Hazardous Materials
  - Journal of Atmospheric Chemistry
  - Atmospheric Environment
  - Environmental Science and Technology
  - Analytical and Bioanalytical Chemistry
  - Toxics
  - Environmental Chemistry

**ScholarGoogle link:** <https://scholar.google.com/citations?user=9CpRirUAAAAJ&hl=en>

### List of Publications

- Samburova, V.**, Shillito, R. M., Berli, M., Khlystov, A. Y., Moosmuller, H. (2021). Effect of Biomass-Burning Emissions on Soil Water Repellency: A Pilot Laboratory Study, *Fire*, 4 (2), 10.3390/fire4020024
- Zhang, T., Bhattarai, C., Son, Y., **Samburova, V.**, Khlystov, A. Y., Varganov, S. (2021). Reaction Mechanisms of Anisole Pyrolysis at Different Temperatures: Experimental and Theoretical Studies, *Energy & Fuels*, 35 (12), 9994–10008, ACS Publications
- Son, Y., Bhattarai, C., **Samburova, V.**, Khlystov, A. Y. (2020). Carbonyls and Carbon Monoxide Emissions from Electronic Cigarettes Affected by Device Type and Use Patterns, *International Journal of Environmental Research and Public Health*, 17 (8), 2767, 10.3390/ijerph17082767
- Rennie, M., **Samburova, V.**, Sengupta, D., Bhattarai, C., Arnott, W. P., Khlystov, A. Y., Moosmüller, H. (2020). Emissions from the Open Laboratory Combustion of Cheatgrass (*Bromus Tectorum*), *Atmosphere*, 11 (4), 406

- Ebersole, J., **Samburova, V.**, Son, Y., Cappelli, D., Demopoulos, C., Capurro, A., Pinto, A., Chrzan, B., Kingsley, K., Howard, K., Clark, N., Khlystov, A. Y. (2020). Harmful chemicals emitted from electronic cigarettes and potential deleterious effects in the oral cavity, *Tobacco Induced Disease*, 18 (May), 41, 10.18332/tid/116988
- Son, Y., Giovenco, D., Delnevo, C., Khlystov, A. Y., **Samburova, V.**, Meng, Q. (2020). Indoor Air Quality and Passive E-cigarette Aerosol Exposures in Vape-shops, *Nicotine and Tobacco Research*, Accepted.
- Beres, N. D., Sengupta, D., **Samburova, V.**, Khlystov, A. Y., Moosmüller, H. (2020). Deposition of Brown Carbon onto Snow: Changes of Snow Optical and Radiative Properties, *Atmos. Chem. Phys.*, 20, 6095-6114, 10.5194/acp-20-6095-2020
- Watts, A. C., **Samburova, V.**, Moosmüller, H. (2020). Criteria-Based Identification of Important Fuels for Wildland Fire Emission Research, *Atmosphere*, 11 (6), 640, 10.3390/atmos11060640
- Sengupta, D., **Samburova, V.**, Bhattarai, C., Watts, A. C., Moosmüller, H., Khlystov, A. Y. (2020). Polar semivolatile organic compounds in biomass-burning emissions and their chemical transformations during aging in an oxidation flow reactor, *Atmospheric Chemistry and Physics*, 20, 8227-8250, 10.5194/acp-20-8227-2020
- Samburova, V.**, McDaniel, M. R., Campbell, D. E., Wolf, M., Stockwell, W. R., Khlystov, A. Y. (2019). Dominant Volatile Organic Compounds (VOCs) measured at four Cannabis growing facilities: Pilot study results, *Journal of the Air & Waste Management Association*, doi: 10.1080/10962247.2019.1654038
- Clegg, S. L., Mazzoleni, L. R., **Samburova, V.**, Taylor, N. F., Collins, D. R., Schum, S. K., Hallar, A. G. (2019). Modelling the hygroscopic growth factors of aerosol material containing a large water-soluble organic fraction, collected at the Storm Peak Laboratory, *Atmospheric Environment*, doi: 10.1016/j.atmosenv.2019.05.068 Accepted
- Nelson, K. N., Boehmler, J., Khlystov, A. Y., Moosmüller, H., **Samburova, V.**, Bhattarai, C., Wilcox, E.M., Watts, A. C. (2019). A Multipollutant Smoke Emissions Sensing and Sampling Instrument Package for Unmanned Aircraft Systems: Development and Testing, *Fire*, 2, 32, doi: 10.3390/fire2020032
- Son, Y., Mishin, V., Laskin, J. D., Mainelis, G., Wackowski, O. A., Delnevo, C., Schwander, S., Khlystov, A. Y., **Samburova, V.**, Meng, Q. (2019). Hydroxyl Radicals in E-cigarette Vapor and E-vapor Oxidative Potentials under Different Vaping Patterns, *Chemical research in toxicology*, doi: 10.1021/acs.chemrestox.8b00400
- Samburova, V.**, Bhattarai, C., Strickland, M., Darrow, L., Angermann, J., Son, Y., Khlystov, A. Y. (2018). Aldehydes in Exhaled Breath during E-Cigarette Vaping: Pilot Study Results, *Toxics*, 6, (3), 46, doi: 10.3390/toxics6030046
- Bhattarai, C., **Samburova, V.**, Sengupta, D., Iaukea-Lum, M., Watts, A. C., Moosmüller, H., Khlystov, A. Y. (2018). Physical and chemical characterization of aerosol in fresh and aged emissions from open combustion of biomass fuels, *Aerosol Science and Technology*, doi: 10.1080/02786826.2018.1498585
- Sengupta, D., **Samburova, V.**, Bhattarai, C., Kirillova, E., Mazzoleni, L., Iaukea-Lum, M., Watts, A. C., Moosmüller, H., Khlystov, A. Y. (2018). Light absorption by polar and non-polar aerosol compounds from laboratory biomass combustion, *Atmos. Chem. Phys. Discuss.*, 18, 10849-10867, doi: 10.5194/acp-2018-161
- Khlystov, A. Y., **Samburova, V.**, 2017: Response to Comment on "Flavoring Compounds Dominate Toxic Aldehyde Production during E Cigarette Vaping", 2017, *Environ. Sci. Technol.*, 51 (4), 2493-2494, doi: 10.1021/acs.est.7b00163

- Taylor, N., Collins, D., Lowenthal, D. H., McCubbin, I. B., Hallar, A., **Samburova, V.**, Zielinska, B. K., Kumar, N., Mazzoleni, L., 2017: Hygroscopic Growth of Water Soluble Organic Carbon Isolated from Atmospheric Aerosol Collected at U.S. National Parks and Storm Peak Laboratory, *Atmos. Chem. Phys.*, **17** (4), 2555–2571, doi: 10.5194/acp-17-2555-2017
- Samburova, V.**, Zielinska, B. and Khlystov, A., 2017. Do 16 Polycyclic Aromatic Hydrocarbons Represent PAH Air Toxicity? *Toxics*, **5**(3), 17.
- Khlystov, A. Y., **Samburova, V.**, 2016: Flavoring Compounds Dominate Toxic Aldehyde Production during E-Cigarette Vaping, *Environ. Sci. Technol.*, **50** (23), 13080-13085, October 27, 2016, doi: 10.1021/acs.est.6b05145
- Samburova, V.**, Connolly, J., Gyawali, M., Yatavelli, R., Watts, A. C., Chakrabarty, R., Zielinska, B. K., Moosmuller, H., Khlystov, A. Y., 2016: Polycyclic aromatic hydrocarbons in biomass-burning emissions and their contribution to light absorption and aerosol toxicity, *Sci. of Tot, Environ.*, **568**, 391-401, <http://dx.doi.org/10.1016/j.scitotenv.2016.06.026>
- Yatavelli, R. L., Chen, L.-W. A., Knue, J., **Samburova, V.**, Gyawali, M., Watts, A. C., Chakrabarty, R. K., Moosmüller, H., Hodzic, A., Wang X., 2017: "Emissions and Partitioning of Intermediate-Volatility and Semi-Volatile Polar Organic Compounds (I/SV-POCs) During Laboratory Combustion of Boreal and Sub-Tropical Peat." *Aeros. Sci. Engineer.* **1**(1): 25-32.
- Chakrabarty, R. K., Gyawali, M., Yatavelli, L., Pandey, A., Watts, A. C., Knue, J. D., Chen, L.-W.A., Pattison, R. R., Tsiabart, A. T., **Samburova, V.**, Moosmuller, H., 2016: Brown carbon aerosols from burning of boreal peatlands: microphysical properties, emission factors, and implications for direct radiative forcing. *Atmos. Chem. Physics*, **16**(5), 3033-3040.
- Chakrabarty, R. K., Gyawali, M., Yatavelli, L., Pandey, A., Watts, A. C., Knue, J. D., Chen, L.-W.A., Pattison, R. R., Tsiabart, A. T., **Samburova, V.**, Moosmuller, H., 2015: Dominance of brown carbon in aerosol emissions from burning of boreal peatlands. *Atmos. Chem. Physics, Discuss.*, **15**, 28793-28813.
- Taylor, N., Collins, D., Lowenthal, D. H., Zielinska, B. K., **Samburova, V.**, Kumar, N., Hallar, G., Mazzoleni, L., McCubbin, I. B., 2016: Hygroscopic Growth of Water Soluble Organic Carbon Isolated from Atmospheric Aerosol Collected at U.S. National Parks and Storm Peak Laboratory, *Atmos. Chem. Phys. Discuss.*, doi: 10.5194/acp-2016-715, doi: 10.5194/acp-2016-715
- Hathwaik, L. T., Redelman, D., **Samburova, V.**, Zielinska, B. K., Shintani, D. K., Harper, J. F., Cushman, J. C., 2015: Transgressive, reiterative selection by continuous buoyant density gradient centrifugation of *Dunaliella salina* results in enhanced lipid and starch content. *Algal Res.*, **9**, 194-204.
- Lowenthal, D. H., Zielinska, B. K., **Samburova, V.**, Collins, D., Taylor, N., Kumar, N., 2015: Evaluation of Assumptions for Estimating Chemical Light Extinction at U.S. National Parks. *J. Air & Waste Manage. Assoc.*, **65**(3), 249-260.
- Zielinska, B. K., Campbell, D. E., **Samburova, V.**, 2014: Impact of Emissions from Natural Gas Production Facilities on Ambient Air Quality in the Barnett Shale Area: a Pilot Study. *J. Air & Waste Manage. Assoc.*, **64**(12), 1369-1383.
- Hallar, A., Lowenthal, D. H., Clegg, S. L., **Samburova, V.**, Taylor, N., Mazzoleni, L. R., Zielinska, B. K., Kristensen, T. B., Chirokova, G., McCubbin, I. B., Dodson, C. D., Collins, D., 2013: Chemical and hygroscopic properties of aerosol organics at Storm Peak Laboratory. *J. Geophys. Res.-Atmos.*, **118**, 4767-4779.
- Samburova, V.**, Lemos, M.S., Hiibel, S., Hoekman, S.K., Cushman, J., Zielinska, B., (2013), Analysis of triacylglycerols and free fatty acids in algae using ultra-performance liquid chromatography mass spectrometry. *J. Amer. Oil Chemists' Soc.*, **90**(1), 53-64.

- Samburova, V.**, Hallar, A. G., Mazzoleni, L. R., Saranjampour, P., Lowenthal, D., Kohl, S. D., Zielinska, B., 2013: Composition of water-soluble organic carbon in non-urban atmospheric aerosol collected at the Storm Peak Laboratory. *Environ. Chem.*, **10**(5), 370-380.
- Mazzoleni, L.R., P. Saranjampour, M.M. Dalbec, **V. Samburova**, A.G. Hallar, B. Zielinska, D. Lowenthal, and Kohl, S. (2012), Identification of Water-Soluble Organic Carbon in Nonurban Aerosols using Ultrahigh-Resolution FT-ICR Mass Spectrometry: Organic Anions. *Environ. Chem.*, **9**(3), 285-297.
- Fisseha, R., Saurer, M., Jäggi, M., Siegwolf, R.T.W., Dommen, J., Szidat, S., **Samburova, V.**, Baltensperger, U. (2009), Determination of primary and secondary sources of organic acids and carbonaceous aerosols using stable carbon isotopes. *Atmos. Environ.*, **43**(2), 431-437.
- Lowenthal, D., Zielinska, Mason, B., Samy, S., **Samburova, V.**, Collins, V., Spencer, C., Taylor, N., Allen, J., and Kumar, N. (2009), Aerosol characterization studies at Great Smoky Mountains National Park, summer 2006. *J. Geophys. Res.*, **114**, D08206, doi:10.1029/2008JD011274.
- Vesna, O., Sjogren, S., Weingartner E., **Samburova, V.**, Kalberer, M., Gaggeler, HW., Ammann M. (2008), Changes of fatty acid aerosol hygroscopicity induced by ozonolysis under humid conditions. *Atmos. Chem. Phys.*, **8**(16), 4683-4690.
- Samburova, V.**, Didenko, T., Kunenkov, E., Emmenegger, C., Zenobi, R., Kalberer, M. (2007), Functional group analysis of high-molecular weight compounds in the water-soluble fraction of organic aerosols. *Atmos. Environ.*, **41**, 4703-4710.
- Fisseha, R., Dommen, J., Gaeggeler, K., Weingartner, E., **Samburova, V.**, Kalberer, M., et al. (2006), Online gas and aerosol measurement of water soluble carboxylic acids in Zurich. *J Geophys Res Atm*, **111**, D12316, doi: 10.1029/2005JD006782.
- Samburova, V.**, Zenobi, R., Kalberer, M. (2005), Characterization of high molecular weight compounds in urban atmospheric particles. *Atmos. Chem. Phys.*, **5**, 2163-2170.
- Samburova V.**, S. Szidat, C. Hueglin, R. Fisseha, U. Baltensperger, R. Zenobi, M. Kalberer (2005), Seasonal variation of high-molecular-weight compounds in the water-soluble fraction of organic urban aerosols. *J. Geophys. Res.*, **110**, D23210, doi:10.1029/2005JD005910.
- Emmenegger, C., Kalberer, M., **Samburova, V.**, Zenobi, R. (2005), High time resolution and size-segregated analysis of aerosol-bound polycyclic aromatic hydrocarbons. *Environ. Sci. Technol.*, **39**(11), 4213-4219.
- Kalberer, M., Sax, M., **Samburova, V.** (2005), Characterization of polymers in nanometer sized atmospheric aerosol particles. *CHIMIA*, **59**(1-2), 43-43.
- Kalberer, M., Sax, M., **Samburova, V.** (2005), Molecular size evolution of oligomers in organic aerosols collected in urban atmospheres and generated in a smog chamber. *Environ. Sci. Technol.*, **40**(19), 5917-5922.
- Emmenegger, C., Kalberer, M., **Samburova, V.**, Zenobi, R. (2004), Analysis of size-segregated aerosol-bound polycyclic aromatic hydrocarbons with high time resolution using two-step laser mass spectrometry. *ANALYST*, **129**(5), 416-420.
- Szidat, S., Jenk, T.M., Gäggeler, H.W., Synal, H.-A., Fisseha, R., Baltensperger, U., Kalberer, M., **Samburova, V.**, Reimann, S., Kasper-Giebl, A., and Hajdas, I. (2004), Radiocarbon (C-14)-deduced biogenic and anthropogenic contributions to organic carbon (OC) of urban aerosols from Zurich, Switzerland. *Atmos. Environ.*, **38**(24), 4035-4044.
- Szidat, S., Jenk, T.M., Gäggeler, H.W., Synal, H.-A., Fisseha, R., Baltensperger, U., Kalberer, M., **Samburova, V.**, Wacker, L., Saurer, M., Schwikowski, M., and Hajdas, I. (2004), Source

apportionment of aerosols by <sup>14</sup>C measurements in different carbonaceous particle fractions. *Radiocarbon*, **46**, 475-484.

Zenobi, R., Alves, S., Daniel, J., De Serio, M., Dietemann, P., Ehala, S., Ford, F., Frankevich, V., Friess, S.D., Guan, X., Hotz, K., Kalberer, M., Koubenakis, A., **Samburova, V.**, Sax, M., Setz, P., Weibel, A., Wendt, S., Wortmann, A., and Zhang, J. (2003), Discovery and sequencing of histidine and ornithine-rich polypeptide in the Helmutite phase of meteoritic carbonaceous matter. *Int. J. Mass Spectrom.*, **228**(2-3), XVII-XXIII.

Orlova, N.V., Proskurnin, M.A., **Samburova, V.A.**, Dryagleva, I.D., Brusnichkin, A.V. (2003), The use of thermal lensing for the determination of pyrogens. *Anal. Bioanal. Chem*, **375**(8), 1038-1044.

Orlova, N.V., Proskurnin, M.A., **Samburova, V.A.**, Tsvetkov, P.V. (2003), Determination of polysaccharides and lipopolysaccharides by spectrophotometry and thermal-lens spectrometry. *J. Anal. Chem*, **58**(2), 149-151.

Orlova, N.V., Proskurnin, M.A., **Samburova, V.A.**, Dryagleva, I.D., Brusnichkin, A.V. (2003), Use of thermal lensing for the determination of pyrogens. *Rev. Sci. Instrum*, **74**(1), 506-508.

### Publication in Encyclopedia

Zielinska, B., and **V. Samburova**, (2011): Residential and non-residential biomass combustion: impacts on air quality. In: Nriagu JO (ed.) Encyclopedia of Environmental Health, volume 4, pp. 819–827 Burlington: Elsevier.

### Reports

Samburova, V., McDaniel, M. R., Khlystov, A. Y., Jasoni, R. L., Larsen, J. D., Arnone, J. A., Omaye, S., 2015: Quantifying volatile organic gaseous emissions from hops (*Humulus lupulus*), as a surrogate for Cannabis, grown in DRI's EcoCELL controlled environment facility.

Samburova, V. External program review (2020). Atmospheric Sciences Graduate Program (UNR/DRI)

### Proposals

FUNDED PROJECTS (role: PI or co-PI):

Title: Detailed Analysis of Brown Carbon Constituents in Biomass Burning Emissions

Sponsor: National Science Foundation

Funding: \$471,584

Duration: 12/1/15 - 11/30/20

Title: Atmospheric Chemistry of Bioaerosols (Atmospheric Chemistry Program)

Sponsor: National Science Foundation

Funding: \$495,039

Duration: 06/01/2018 to 05/31/2021

Title: Closing gaps in measurements and understanding: plume characteristics, live fuel moisture dynamics, and process-based modeling

Sponsor: USDA – Forest Service

Funding: \$300,729.00

Duration: 10/01/20 - 09/30/24

Title: Measuring Absorption Spectra of Carbonaceous Combustion Aerosols to Enable their Identification and Quantification by Shortwave Remote Sensing

Sponsor: National Aeronautics & Space Administration

Funding: \$500,000

Duration: 11/01/14 - 4/30/17

Title: Chemical Analysis for Tobacco Flavorings Emission Characterization

Sponsor: Lovelace Respiratory Research Institute

Funding: \$60,640

Duration: 12/21/2016 to 03/31/2017

Title: OAL analysis of e-cigarettes

Sponsor: DAS, VPR, OAL, Applied Innovation Center (AIC)

Funding: \$65,000

Duration: 05/01/2016 to 06/30/2018

Title: Quantifying Volatile Gaseous Emissions from Hops (*Humulus Lupulus*, as a Surrogate for Cannabis) Grown at Different Temperatures in DRI's Ecocell Controlled Greenhouse Environment Facility

Sponsor: Washoe County

Funding: \$50,000

Duration: 08/12/14 - 05/22/15

Title: Soils/Methyl Salicylate

Sponsor: Endpoint Consulting

Funding: \$5,618

Duration: 07/25/2016 - 08/25/2016

Title: Analysis of E-Cig Fluids

Sponsor: Lovelace Respiratory Research Institute

Funding: \$9,500

Duration: 12/06/2016 - 01/31/2017

Title: Development and validation of new analytical techniques for detailed qualitative and quantitative analysis of organic species in particulate and gaseous tobacco emissions, including emissions from flavored tobacco products, e-cigarettes, and cigarette butts

Agency: IPA (DRI)

Budget: \$ 14,772

Submitted: July 2015, funded: September 2015

Title: Characterization of Atmospheric Biological Aerosols

Sponsor: EDGES (DAS)

Budget: \$35,971

Funded: 2012

Title: Systematically Determining Brown Carbon Chemical Composition and Optical Properties

Agency: IPA (DRI)

Budget: \$ 14,182

Submitted: March 2011



Title: Development of an automated collection system (ACES) for off- or on-line chemical analysis of organic aerosol species

Sponsor: National Science Foundation

Funding: \$302,103

Duration: 09/01/2019 to 08/31/2021

Title: Association of Smoke from Wildfires and Prescribed Burns with Maternal, Child, and Adult Health Outcomes in Reno, NV

Sponsor: National Institutes of Health

Funding: \$4,091,772

Duration: 07/01/2018 to 06/30/2023

Title: NEVADA-S

Sponsor: Clark County School District

Funding: \$16,631

Duration: 03/02/2015 to 06/30/2016

Title: Saturation Air Monitoring of Air Toxics in Davis County, Utah

Sponsor: State of Utah Department of Env. Quality

Funding: \$177,506

Duration: 11/28/2016 - 12/14/2017

Monitoring of Emissions from Barnett Shale Natural Gas Production Facilities for Population Exposure Assessment

Sponsor: National Urban Air Toxics Research Center, Mickey Leland

Funding: \$ 249,797

Duration: 02/01/2010 - 08/31/2010

FUNDED PROJECTS as lead key-personnel:

Title: Collaborative Research: Hygroscopic Properties of Aerosol Organics

Sponsor: National Science Foundation

Funding: \$ 347,253

Duration: 09/01/09 – 08/30/14

Title: Comprehensive Light-Duty Gasoline Vehicle Exhaust Fuel Effects Test Program

Sponsor: Southwest Research Institute

Funding: \$ 311,595

Duration: 02/10 – 03/11

DECLINED PROPOSALS (role: PI or co-PI):

Title: Collaborative Research: Kinetics and Dynamics of Thermal Decomposition of Flavoring Compounds

Sponsor: National Science Foundation

Funding: \$284,771

Duration: 9/01/18 - 8/31/21

Title: Biomarker-based assessment of systemic cardiovascular toxicity risk from use of flavored e-cigarettes

Sponsor: National Institutes of Health

Funding: \$24,506

Duration: 07/01/2017 to 06/30/2019

Title: Collaborative Research: Kinetics and Dynamics of Thermal Decomposition of Flavoring Compounds

Sponsor: National Science Foundation

Funding: \$284,771

Duration: 9/01/18 - 8/31/21

Title: Sorption, mobility, and bioaccumulation of short-chain perfluoroalkyl acids

Sponsor: Environmental Protection Agency (EPA)

Funding: \$499,587.80

Duration: 04/01/19 – 03/31/22

Title: Comprehensive analysis and exposure assessment of flavored e-cigarette's emissions

Sponsor: National Institutes of Health

Funding: \$247,020

Duration: 04/01/2017 to 03/31/2019

Title: Analysis of DNPH Aldehyde Cartridges for the PAMS 2016 Season (ID: 15908)

Agency: San Joaquin Valley Unified Air Pollution Control District

Budget: \$29,452

Submitted: 03/03/2016

Title: Analysis of Non-Methane Organic Compounds for the PAMS 2016 Season (ID: 15907)

Agency: San Joaquin Valley Unified Air Pollution Control District

Budget: \$86,292

Submitted: 03/03/2016

Title: Analysis of DNPH Aldehyde Cartridges for the 2015 PAMS Season.

Agency: San Joaquin Valley Unified Air Pollution Control District

Budget: \$29,170

Submitted: January 29, 2014

Title: Analysis of Non-methane Organic Compounds for the 2015 PAMS Season.

Agency: San Joaquin Valley Unified Air Pollution Control District

Budget: \$90,880

Submitted: January 29, 2014

Detailed Characterization of Biomass-Burning Brown Carbon Species Using High Resolution Mass Spectrometry

Sponsor: Pacific Northwest National Laboratory (PNNL); Environmental Molecular Sciences Laboratory (EMSL)

Budget: use of EMSL resources with no charge

Submitted: February 2016

Title: Evaluation of Radiello Diffusive Passive Samplers for Measuring Volatile Halogenated Organic Compounds

Sponsor: IPA (DRI)

Budget: \$14,772

Submitted: July 2015

Title: Characterization of algal strains as a potential renewable energy feedstock

Sponsor: Pacific Northwest National Laboratory (PNNL); Environmental Molecular Sciences Laboratory (EMSL)

Budget: use of EMSL resources with no charge

Submitted: February 2012

Title: Analysis of Characteristic Bioaerosol Organic Tracers and Tracers Emitted Upon Bioaerosol Combustion

Sponsor: IPA (DRI)

Budget: \$14,333

Submitted: April 2014, Jan 2015 –June 2015

Title: Analysis of DNPH Aldehyde Cartridges for the 2010 PAMS Season.

Agency: San Joaquin Valley Unified Air Pollution Control District

Budget: \$128,479

Submitted: March, 2010

Title: Analysis of Non-methane Organic Compounds for the 2010 PAMS Season.

Agency: San Joaquin Valley Unified Air Pollution Control District

Budget: \$90,880.00

Submitted: March, 2010

Title: Breath air analysis – new direction for organic analytical laboratory (OAL, DRI) development

Agency: IPA (DRI)

Budget: \$ 13,571.00

Submitted: July 2016

Title: Developing of passive method for analysis of biogenic volatile organic species (terpenes) including emissions generated by Cannabis plants

Agency: IPA (DRI)

Budget: \$ 14,995

Submitted: Aug 2017

Title: Wildland Fire Processes and Effects on Radiative Forcing and Climate Change: Feedbacks, Risks, and Resilience

Sponsor: National Science Foundation EPSCoR

Funding: \$7,028,632

Duration: 07/01/2018 to 06/30/2023

Title: Markers of Inflammation and Oxidative Stress Associated with a Change from Flavored to Flavorless E-cigarette Liquid in Human Volunteers

Sponsor: National Institutes of Health

Funding: \$3,795,836

Duration: 09/01/2017 to 08/31/2022

Title: Development of a puff topography reproduction device for adequate and accurate measurements of electronic cigarette emissions

Sponsor: IPA

Funding: \$11,848

Duration: 06/2017 to 12/2017

Title: Optical and Chemical Properties of Tar Balls

Sponsor: National Science Foundation

Funding: \$572,912

Duration: 6/01/17 - 5/31/20

Title: A Pilot Study to Assess Secondary E-Cigarette Exposure and Ways to Minimize It

Sponsor: National Institutes of Health

Funding: \$444,403

Duration: 4/16/17 - 4/15/19

Title: MRI: Acquisition of High Resolution Time-of-Flight Chemical Ionization Mass Spectrometer Coupled to a Micro Orifice Volatilization Impactor (MOVI-HRToF-CIMS)

Sponsor: National Science Foundation

Funding: \$472,700

Year: 2013

Title: FIREX: Quantification of Light Absorbing Compounds in Biomass Burning Aerosols, their Reactivity, Volatility, and Nitrogen Content

Sponsor: NOAA Climate Program Office (CPO)

Budget: \$ 596,500.00

Submitted: September 2015; declined: February 2016

Title: Collaborative Research: Hygroscopic Properties of Marine Aerosol Organics (HPMAO)

Sponsor: National Science Foundation

Funding: \$529,168

Duration: 10/01/15 - 9/30/18

Title: Understanding the role of bioaerosols within atmospheric clouds

Sponsor: National Aeronautics & Space Administration

Funding: N/A

### **Invited Speaker**

The Utah University, "E-cigarettes. Are they good or bad?" September 11, 2019

Nevada Tobacco Prevention Coalition Meeting, "E-cigarettes. Are They as Safe as Advertised?"  
March 8, 2017

Key-note speaker at the 216th 2YC3 conference, "E-cigarettes. Are They as Safe as Advertised?" April 1, 2017

UC Davis, "Atmospheric Organic Aerosols. Are they Important?" October 18, 2016