LAURYN E. DEGREEFF, Ph.D.
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Research Chemist

U.S. Naval Research Laboratory
Chemistry Division
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EXPERIENCE

2018-present Faculty – Florida International University, Department of Chemistry

Work duties: *Serves on dissertation committees for Ph.D. and master's students in the area of forensic science research. This will include directing research path for said graduate students, as well as writing grant proposals for research and equipment funding.*

2014-present Research chemist – U.S. Naval Research Laboratory, Chemistry Division

Research interest: *Analysis, detection, and generation of vapors and related canine detector science.*

Work duties*: Acts as principle investigator on research projects and oversees supporting personal and researchers. Design research projects and obtain funding for the study of explosive and explosive-related materials and other contraband, to include, but not limited to, trace vapor analysis and material headspace characterization. Research encompasses many forms of vapor detection, as well as other analytical techniques, with a focus on detection by canine, and is reported in the form of written reports and manuscripts, as well as regular oral presentations at conferences and educational seminars for the operational community.*

2012-2014 Post-doctoral fellow – U.S. Naval Research Laboratory, Chemistry Division

Research interest: *Headspace analysis of low volatility explosives and canine training aids.*

2011-2012 Visiting scientist – Federal Bureau of Investigation, Counterterrorism and Forensic Science Research Unit

Research interest*: Detection and determination of volatiles from human scent and odor by analytical instrumentation and development of canine training aids.*

2006-2010 **Graduate research assistant – Florida International University**

Research interest: *Development of a dynamic headspace concentration technique for the non-contact sampling of human odor samples and the creation of canine training aids.*

2006/2008 **Teaching assistant – Florida International University**

Work duties: *Instructed students on basic laboratory and safety practices. Administered and graded homework and exams.*

2005-2006 **Undergraduate research assistant – Chapman University**

Research interest: *Reactivity of iron oxyhydroxide nanoparticles to metals.*

2002 **Summer intern – New York City Office of the Chief Medical Examiner**

Work duties: *Worked under Dr. Mark Flomenbaum, Deputy Chief Medical Examiner of New York City. Observed and assisted in autopsies, court proceedings, and other workings of the Office of the Chief Medical Examiner. Organized data and materials for potential research studies.*

EDUCATION

2010 **Florida International University – Ph.D. Chemistry**
Miami, FL
Dissertation title: *Development of a dynamic headspace concentration technique for the non-contact sampling of human odor samples and the creation of canine training aids.*
Advisor: *Dr. Kenneth Furton*

2006 **Chapman University – B.S. Chemistry**
Orange, CA
Thesis title: *The photo-production of acetone from dissolved organic matter in seawater.*

2003 **New York University – B.A. Anthropology, pre-medical**
New York, NY

FUNDING (Principle Investigator)

2020-2021 **Bureau of Safety and Environmental Enforcement**
"Canine oil detection – Using odor signatures to improve training detection proficiency on land and water"
Collaborators – Chiron K9, Owens Coastal Consultants

2020 **U.S. Army Combat Capabilities Development Command**

"Analytical chemistry support for field testing"

2020-2021 **National Institute of Justice**
"Non-contact detection of fentanyl and other synthetic opioids"
Collaborator – Florida International University

2019-2021 **U.S. Army Combat Capabilities Development Command**
"Quantitative measurement of vaporous targets emanating from PDMS odor capture-and-release technology held in the Training Aid Delivery Device (TADD)"

2019-2021 **Office of Naval Research – Basic Research**
"Empirical and theoretical determination of canine olfaction detection limits using a quantitative vapor delivery system"
Collaborator – Auburn University

2019 **Department of Defense Domestic Preparedness Support Initiative**
"Mixed Odor Delivery Device (MODD) to enhance canine narcotics and explosives detection training by military and law enforcement"

2017 **Edgewood Chemical and Biological Center, Department of Army**
"Assessment of the status of canine detection of homemade explosives"

2016 **Department of Defense Domestic Preparedness Support Initiative**
"Development of an alternative Mixed Odor Delivery Device (MODD) for canine training"

2015-2018 **Office of Naval Research – Basic Research**
"Exploring the generalization-discrimination balance in odor detection canines"

2015 **Jerome and Isabella Karle Distinguished Scholar Fellowship**
"Elucidation and modeling of the dynamic vapor signature of hexamethylene triperoxide diamine"

2013-2015 **Office of Naval Research**
"Analytical support, characterization and optimization of a canine training aid delivery system"

PROFESSIONAL ACTIVITIES

2019-present **Joint Services Working Dog Research Steering Committee**

2018-2019 **Subject matter expert** to Lowland Search and Rescue on "Improving location of missing people from vulnerable populations using trained search dog"

2016-present **Training seminars** – Regularly present training seminars supporting military and law enforcement canine handlers

2015-present **Mentor** to National Research Council post-doctoral fellows

2015-present **Mentor** to summer interns through the Naval Research Laboratory summer internship programs

2017 **Co-organizer** – Department of Defense Canine Detection Research Focus Group, hosted at Naval Research Laboratory

2014-2017 Developed, patented, and brought to market canine training device (Mixed Odor Delivery Device)

HONORS AND AWARDS

2020 Keynote speaker for Schmid College Program Honors and Capstone Conference (Chapman University)

2018 Naval Research Laboratory Technology and Transition Award

2018 Naval Research Laboratory Edison Patent Award

2018 Federal Laboratory Consortium Award for Excellence in Technology Transfer

2015 Jerome and Isabella Karle Distinguished Scholar Fellowship

2013 National Research Council Research Associateship

PRESS

Naval Engineers Journal: "Controlling the leash of your career," *In press*.

Reactions by American Chemical Society: "Explosives detection," *In press*.

Defense Media Activity: "Canines detect explosives," *In press.*

"Shifting focus from traditional to homemade explosives detection," *K-9 Cop Magazine*, by L. DeGreeff et al. (Part I. Issue 57, August/September 2019; Part II. Issue 58, October/November 2019; Part III. Issue 59, December/January 2020).

Richmond NBC12: "Chemists work to train drug-sniffing dogs for law enforcement purposes," 27 July 2019.

NRL Pipeline: "NRL Scientist Educates Baltimore on Research to Support Fleet, Nation," 19 Oct 2018.

Baltimore WBFF Fox 45 news: two live segments showcasing Mixed Odor Delivery Device, 5 Oct 2018.

NRL YouTube: "K9 Detection Research," 27 June 2018.

"Introducing Bear, a Seattle Police Dog that Can Sniff Out Porn" *The Stranger*, by Sydney Brownstone, 11 Apr 2018

NRL YouTube: "NRL Chemist Develops Device to Train Canine Units," 6 July 2017.

"New Navy Device Helps Dogs Smell Explosives Better" *Stars and Stripes*, by Scott Wyland, 8 Aug 2017

"Engineer Investigates Odor Detection Canines" *South Potomac Pilot*, by Holly Dodds, 18 Aug 2017

"ONR Helps Train the Future Canine Force" *Office of Naval Research Media Release*, by Warren Duffie, 28 April 2015.

Manuscripts and Ph.D. dissertation submitted as evidence in State of Florida v. Casey Anthony, May-June 2011

SELECTED PUBLICATIONS

Books

DeGreeff, L.E., Schultz, C. (Eds.). *Canines: The Original Biosensors*, Pan Stanford Publishing, *In preparation* (to be published in 2021).

Peer-reviewed

DeGreeff, L.E., Simon, A.G., Peranich, K., Holness, H.K., Frank, K., Furton, K.G. "Generalization and discrimination of molecularly similar odorants in detection canines and the influence of training." *Behavioural Processes*, **2020**, *177*, 104148.

Crespo-Cajigas J.M., Perez-Almodovar, L., DeGreeff, L.E. "Headspace analysis of potassium chlorate using on-fiber SPME derivatization coupled with GC/MS." *Talanta*, **2019**, *205*, 120127.

Simon, A.G., DeGreeff, L.E., Frank, K., Peranich, K., Holness, H.K., Furton K.G. "A method for controlled odor delivery in canine olfactory testing." *Chemical Sensing*, **2019**, *44(6)*, 399-408.

Simon, A.G., DeGreeff, L.E. "Variation in the headspace of bulk hexamethylene triperoxide diamine (HMTD): Part II. Analysis of non-detonable canine training aids. *Forensic Chemistry*, **2019**, *13*, 100155.

Katilie, C.J., Simon, A.G., DeGreeff, L.E. “Quantitative analysis of vaporous ammonia by online derivatization with gas chromatography – mass spectrometry with applications to ammonium nitrate-based explosives.” *Talanta*, **2019**, *193*, 87-92.

DeGreeff, L.E., Katilie, C.J., Malito, M., Giordano, B. “Mixed vapor generation device for delivery of homemade explosives vapor plumes.” *Analytica Chimica Acta*, **2018**, *1040*, 41-48.

DeGreeff, L.E., Cerreta, M., Katilie, C.J. “Variation in the headspace of bulk hexamethylene triperoxide diamine (HMTD) with time, environment, and formulation.” *Forensic Chemistry*, **2017**, *4*, 41-50.

DeGreeff, L.E., Malito, M., Katilie, C.J., Brandon, A., Conroy, M.W., Peranich, K., Anath, R., Rose-Pehrsson, S.L. “Passive delivery of mixed explosives vapor from separated components.” *Forensic Chemistry*, **2017**, *4*, 19-31.

PATENTS

DeGreeff, L.E., Crespo-Cajigas, J.M. “Derivatization of vaporous chlorine by propylene oxide.” Provisional patent submitted (Navy Case No. 109358-US1), **01 Feb 2019**.

DeGreeff, L.E., Katilie, C.J. “Online chemical derivatization using a cooled programmed temperature vaporization inlet.” US Patent No. US10648955B2, **12 May 2020**.

DeGreeff, L.E., Malito, M., Brandon, A., Katilie, C.J. “Mixed Odor Delivery Device (MODD),” U.S. Patent No. US9986720B2, **05 June 2018**.