

Daniel Christopher Leslie

University of Virginia, Department of Chemistry
419 McCormick Rd, Charlottesville, VA 22904

EDUCATION

University of Virginia, Charlottesville, VA
Ph.D., Bioanalytical Chemistry Expected 2010
Dissertation: Enabling Technologies for Microfluidic Flow Control and Detection

Colorado State University, Fort Collins, CO
B.S., *cum laude*, Chemistry August 2005

RESEARCH

Doctoral Research August 2005-present

University of Virginia, Advisor: Professor James P. Landers

- Designed, fabricated, and characterized a microfluidic flow control scheme by using passive, elastomeric structures analogous to electrical circuit elements (resistors, capacitors, diodes, etc...) that greatly reduces dependence on external flow control components.
- Developed a simple microfluidic flow measurement technique for microdevice performance characterization.
- Engineered a completely non-contact thermocycling platform for microfluidic forensic DNA amplification for human identification.

Internship Research September-December 2008

American Type Culture Collection, Supervisor: Marian McKee, Ph.D.

- Developed of microfluidic protein detection method based on nucleic acid amplification.
- Uncovered an oversight in published procedures and developed a method to assist in the design of proximity ligation reactions.

Undergraduate Research August 2004-August 2005

Colorado State University, Advisor: Professor Charles S. Henry

- Developed polymer microdevices for electrochemical detection of carbohydrates.
- Conjugated biomolecules for a novel capillary electrophoresis immunoassay technique.

ACADEMIC AWARDS

NIH Biotechnology Training Program, *University of Virginia* 2007-2009

Chemistry Departmental Fellowship, *University of Virginia* 2005-2008

Gordon Research Conference, *Thin Film and Small Scale Mechanical Behavior*
Poster Session Award Winner 2008

PUBLICATIONS

Peer-Reviewed Journals

D.C. Leslie, B.A. Melnikoff, D.J. Marchiarullo, D.R. Cash, J.P. Ferrance and J.P. Landers, "A Simple Method for the Evaluation of Microfluidic Architecture Using Flow Quantitation via a Multiplexed Fluidic Resistance Measurement," *Under review*.

D.C. Leslie, A. Sohrabi, P. Ikonomi, M.L. McKee and J.P. Landers, "Microfluidic Proximity Ligation for Protein Detection," *Under review*.

M.R. Begley, M. Utz, **D.C. Leslie**, H. Haj-hariri, H. Bart-Smith, and J.P. Landers, "Periodic Dynamic Response of Fluidic Networks With Deformable Features," *Applied Physics Letters* **95**, 203501 (2009).

E. Seker, **D.C. Leslie**, H. Haj-Hariri, J. P. Landers, M. Utz and M.R. Begley, "Nonlinear pressure-flow relationships for passive microfluidic valves," *Lab on a Chip*, **9**, 2691 (2009).

C.W. Price, **D.C. Leslie** and J.P. Landers, "Nucleic acid extraction techniques and application to the microchip," *Lab on a Chip*, **9**, 2484-2494 (2009).

D.C. Leslie and J.P. Landers, "A New Tool for Oligonucleotide Import into Cells," *Clinical Chemistry*, **55**, 609-610 (2009).

D.C. Leslie, C.J. Easley, E. Seker, J.M. Karlinsey, M. Utz, M.R. Begley and J.P. Landers, "Frequency-specific flow control in microfluidic circuits with passive elastomeric features," *Nature Physics* **5**, 231-235 (2009).

(Highlighted by Howard A. Stone, "Tuned-in flow control," *Nature Physics* **5**:178, 2009; Editor's Choice, *Science* **323**:1539, 2009; featured in Research Highlights, *Lab on a Chip* **9**:861, 2009)

Patent Applications

C.J. Easley, J.M. Karlinsey, **D.C. Leslie**, M.R. Begley, and J.P. Landers, "Passive Components for Micro-fluidic Flow Profile Shaping and Related Method Thereof," United States Patent Application EP1938425, August 2006.

D.M. Finkler, **D.C. Leslie**, N.S. Barker, J.P. Landers, "Visual Detector for Very Small Levels of Human DNA," United States Provisional Patent Application Number US2009/036983, March 2009.

Selected Conference Proceedings

D.C. Leslie, D. Finkler, J. Li, C.W. Price and J.P. Landers, "A Versatile, Visual Microfluidic Detector," *Proceedings of the Thirteenth International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, Jeju, Korea. November 1-5, 2009.

D.C. Leslie, A. Sohrabi, P. Ikonomi, M.L. McKee and J.P. Landers, "Microfluidic Proximity Ligation for Protein Detection," *Proceedings of the Thirteenth International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, Jeju, Korea. November 1-5, 2009.

D.C. Leslie, L.A. Legendre, E. Seker, B.C. Strachan and J.P. Landers, "Microfluidic Human Genetic Profiling Using Fully Non-Contact Temperature Control," *Proceedings of the Twelfth International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, San Diego, California. October 12-16, 2008.

D.C. Leslie, E. Seker, C.J. Easley, J.P. Landers, M. Utz, and M.R. Begley, "Channel Switching and Cross-T Injection without Externally Activated Valves," *Proceedings of the Twelfth International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, San Diego, California. October 12-16, 2008.

D.C. Leslie, C.J. Easley, J.P. Landers, M. Utz and M.R. Begley, "The Mechanics of Frequency-Specific Microfluidic Networks," *Proceedings of the Eleventh International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, Paris, France, October 7-11, 2007.

D.C. Leslie, C.J. Easley, J.P. Landers, M. Utz and M.R. Begley, "The Mechanics of Deformable Fluidic Diodes: Implications for Design and Performance," *Proceedings of the Eleventh International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS)*, Paris, France, October 7-11, 2007.

ORAL PRESENTATIONS

D.C. Leslie, C.J. Easley, J.P. Landers, M. Utz and M.R. Begley*, "The Development of Passive Elastomeric Components for Flow Control in Microfluidic Networks," 22nd International Symposium on Microscale Bioseparations and Methods for Systems Biology, 2008, Berlin, Germany.

C.J. Easley, J.M. Karlinsey, **D.C. Leslie***, M.R. Begley and J.P. Landers, "Directional and Frequency-Dependent Flow Control in Microfluidic Circuits Using Passive Elastomeric Components," 10th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), 2006, Tokyo, Japan.

* denotes presenter

MENTORING

Undergraduate Students May 2007-Present

Brett Melnikoff, *Biology Major*, Microdevice flow measurement method
Arjun Ramesh, *Chemistry Major*, Magnetic microparticle DNA detection
Daniel Nelson, *Chemistry Major*, Droplet microfluidics
Sarah Croessmann, *Chemistry Major*, DNA extraction techniques
Briony Strachan, *Forensic and Analytical Major*, Non-contact thermocycling platform
Farley Will, *Computer Science Major*, Non-contact thermocycling platform

TEACHING

Teaching Assistant, *University of Virginia* Fall 2005

- Instructed undergraduate students in scientific thinking and writing
- Provided both hands-on wet lab and computer simulation experimental environment

Teaching Assistant, *University of Virginia* Spring 2006

- Instructed undergraduate students on common biochemical laboratory techniques
- Counseled students in scientific writing and literature research

PROFESSIONAL AFFILIATIONS

Member of the American Association for the Advancement of Science

Member of the American Chemical Society

Reviewer for *Analytica Chimica Acta*

REFERENCES

Available upon request.