

# HEATHER S. SMALLWOOD, PhD

## PERSONAL INFORMATION

*email* [hsmallwo@UTHSC.edu](mailto:hsmallwo@UTHSC.edu)  
*phone* (P) +1 (901) 634 6342 · (W) +1 (901) 448 3068  
*employer* University of Tennessee Health Science Center  
*institute* Children's Foundation Research Institute  
*department* Pediatrics  
*address* 71 S. Manassas · Memphis, TN 38103

## CURRENT POSITION

Assistant Professor in a translational research laboratory focused on host response to viral infection, immunopathology, and metabolism.

## RESEARCH INTEREST

Defining the molecular mechanisms dictating immunodominance and the host metabolic response to influenza for developing therapeutic interventions.

## WORK EXPERIENCE

*2015–present* Assistant Professor · UTHSC – MEMPHIS, TN

*University of  
Tennessee Health  
Science Center*

Research interests in the host response to viral infection and metabolic modulation for treatment modality. Subspecialty interests include unique aspects of infant and pediatric response to respiratory infection and other related complicating risk factors as well as therapeutic and biomarker discovery for personalized medicine.

Reference: Jon McCULLERS, MD · +1 (901) 287 6399 · [jmccul10@uthsc.edu](mailto:jmccul10@uthsc.edu)

*2009–2015* Post Doctoral Fellow · SJCRH – MEMPHIS, TN

*St. Jude Children's  
Research Hospital*

Developed proteomic and transcriptomic platform to define changes in immune and respiratory responses to influenza resulting in the initiation of high-throughput screening to repurpose metabolic drugs for use as potential anti-virals.

Reference: Paul THOMAS, PHD · +1 (901) 595 6507 · [paul.thomas@stjude.org](mailto:paul.thomas@stjude.org)

*2007–2009* Research Associate, M.S. · PNNL – Richland, WA

*Pacific Northwest  
National  
Laboratory*

*2003–2007* Student Intern, M.S. · PNNL – Richland, WA

*2002–2003* Research Associate, B.A. · PNNL – Richland, WA

Research Scientist in an interdisciplinary group focused on identification of damage sensors and pathways and their linkage to disease pathologies and environmental stress.

Reference: Brian THRALL, PHD · +1 (509) 371 7307 · [brian.thrall@pnl.gov](mailto:brian.thrall@pnl.gov)

*2007–2008* Teaching Assistant · WSU – Richland, WA

*Washington State  
University*

Designed curriculum for and taught a laboratory in radiation biology resulting in a peer reviewed publication for interested students (see publications section: Calmodulin Mediates DNA Repair Pathways involving H2AX in Response to Low-Dose Radiation Exposure of RAW 264.7 Macrophages.

Reference: Allan FELSOT, PHD · +1 (509) 372 7365 · [afelsot@wsu.edu](mailto:afelsot@wsu.edu)

## EDUCATION

- 2005-2008 Washington State University · Richland, WA  
 Doctor of Philosophy  
 Environmental Toxicology · School: Biological Sciences  
 Dissertation: *Universal Mechanisms of Exposure: Calmodulin a regulator of the macrophage response to radiation and target of enzymatic repair.*  
 Description: This dissertation was summarized in two manuscripts: Smallwood, HS et al. 2007 described the use of FTICR mass spectrometry to identify post translational modifications and denitrase enzyme activity in activated macrophages. Smallwood, HS et al. 2009 described the role of Calmodulin in mediating macrophage DNA repair pathways.  
 Advisors: Prof. Allan FELSOT (COMMITTEE CHAIR), Prof. Antonne BROOKS, & Adjunct. Prof. Thomas SQUIER
- 2003-2005 Washington State University · Richland, WA  
 Master of Science  
 Biology · School: Biological Sciences  
 Thesis: *Calmodulin: a multipurpose regulator of the macrophage response to lipopolysaccharide and Salmonella typhimurium.*  
 Description: This thesis is summarized in Smallwood et al. 2006, in which we found iNOS activity and stability is dependent on Calmodulin and modulating this interaction can alter bacterial killing capacity of macrophages.  
 Advisors: Profs. Gene SCHRECKHISE, Diana BIGELOW & Thomas SQUIER
- 1995-2000 The University of Kansas · Lawrence, KS  
 Bachelor of Arts  
 Microbiology · School: Molecular and Biosciences  
 Description: This degree focused heavily on microbiology, immunology and infectious disease.

## MANUSCRIPTS IN PREPARATION

- mBIO* *Coordinated Metabolic Response of Dendritic Cells to Influenza Infection.* 2017 (in preparation).  
 S. REZINCIUC, R. WANG, E. ZINK, D. LOPEZ-FERRER, S. MILASTA, D. GREEN, L. PASA-TOLIC, P.G. THOMAS, and **H.S. SMALLWOOD**
- Journal of Immunology* *Memory Potential is Determined by Priming Epitope Number.* 2017 (in preparation).  
**H.S. SMALLWOOD** C. REYNOLDS, A.HANDEL, A.H. ELLEBEDY, M.Y. MORRIS, S.A. BROWN, P.C. DOHERTY, and P.G. THOMAS

## PUBLICATIONS

- Cell Reports* *Targeting metabolic reprogramming by influenza infection for therapeutic intervention.*  
 Cell Reports. 23 May 2017;Vol. 19, Issue 8, p16401653  
**H.S. SMALLWOOD**, S. DUAN, M.M. MORFOUACE, B. SHULKIN, A. SHALAT, E. ZINK, S. MILASTA, R. BAJRACHARYA, C. OSHANSKY, M. ROUSSEL, D. GREEN, L. PASA-TOLIC, and P.G. THOMAS
- The FASEB Journal* *Pharmacologic activation of estrogen receptor increases mitochondrial function, energy expenditure, and brown adipose tissue.* FASEB J. 2017 Jan;31(1):266-281.doi: 10.1096/fj.201600787RR.  
 S. PONNUSAMY, Q.T. TRAN, **H.S. SMALLWOOD**, T. THIYAGARAJAN, S. BANERJEE, D.L. JOHNSON, J.T. DALTON, R.D. SULLIVAN, D.D. MILLER, D. BRIDGES, and R. NARAYANAN

## PUBLICATIONS CONTINUED

- Plos Pathogens* Diverse heterologous primary infections radically alter immunodominance hierarchies and clinical outcomes following H7N9 influenza challenge in mice. *Plos Pathogens*. 2015 Feb 10;11(2):e1004642.  
S. DUAN, V. MELIPOULOS, J.L. McCLAREN, C. SANDERS, H.S. SMALLWOOD, R.J. WEBBY, S. SCHULTZ-CHERRY, P.C. DOHERTY, and P.G. THOMAS
- mBIO* Seasonal influenza vaccination is the strongest correlate of cross-reactive antibody response in migratory bird handlers. *MBio*. 2014 Dec 9;5(6):e02107-14.  
C. OSHANSKY, S.S. WONG, T. JEEVAN, H.S. SMALLWOOD, R.J. WEBBY, S.C. SHAFER, and P.G. THOMAS
- Immunity* Distinct Epigenetic Signatures Delineate Transcriptional Programs during Virus-Specific CD8 + T Cell Differentiation. *Immunity*. 2014 Nov 20;41(5):853-865.  
B.E. RUSS, M. OLSHANSKY, H.S. SMALLWOOD, A.E. DENTON, J.E. PRIER, A.T. STOCK, M.L. NGUYEN, S. ROWE, M.R. OLSON, D.B. FINKELSTEIN, A. KELSO, P.G. THOMAS, T.P. SPEED, S. RAO and S.J. TURNER
- Biochemistry* Aging Enhances the Production of Reactive Oxygen Species and Bactericidal Activity in Peritoneal Macrophages by Up-Regulating Classical Activation Pathways. *Biochemistry*. 2011 Nov 15;50(45):9911-22.  
H.S. SMALLWOOD, D. LOPEZ-FERRER, and T.C. SQUIER
- Journal of the American Society for Mass Spectrometry* A top-down LC-FTICR MS-based strategy for characterizing oxidized calmodulin in activated macrophages. *J Am Soc Mass Spectrom*. 2010 Jun;21(6):930-9.  
N. LOURETTE, H.S. SMALLWOOD, S. WU, E.W. ROBINSON, T.C. SQUIER, R.D. SMITH, and L. PASA-TOLIC
- Chemical Research in Toxicology* Calmodulin Mediates DNA Repair Pathways involving H2AX in Response to Low-Dose Radiation Exposure of RAW 264.7 Macrophages. *Chem Res Toxicol*. 2009 Mar 16;22(3):460-70.  
H.S. SMALLWOOD, D. LOPEZ, P.E. EBERLEIN, D.J. WATSON, and T.C. SQUIER
- Analytical Chemistry* Evaluation of a high-intensity focused ultrasound-immobilized trypsin digestion and (18)O-labeling method for quantitative proteomics. *Anal. Chem*. 2009 Aug 1;81(15):6272-7.  
D. LOPEZ-FERRER, K.K. HIXSON, H.S. SMALLWOOD, T.C. SQUIER, K. PETRITIS, and R.D. SMITH
- Infection and Immunity* Proteomic investigation of the time course responses of RAW 264.7 macrophages to infection with *Salmonella enterica*. *Infect Immun*. 2009 Aug 1; 77(8):3227-33.  
L. SHI, S.M. CHOWDHURY, H.S. SMALLWOOD, H. YOON, H.M. MOTTAZ, A.D. NORBECK, J.E. McDERMOTT, T.R. CLAUSS, F. HEFFRON, R.D. SMITH, and J.N. ADKINS
- Journal of Proteomics & Bioinformatics* Proteome of *Salmonella Enterica* Serotype Typhimurium Grown in a Low Mg/pH Medium. *J Proteomics Bioinform*. 2009 Nov 30;2:388-397.  
L. SHI, C. ANSONG, H.S. SMALLWOOD, L. ROOMEREIM, J.E. McDERMOTT, H.M. BREWER, A.D. NORBECK, A.C. TAYLOR, J.K. GUSTIN, F. HEFFRON, R.D. SMITH, and J.N. ADKINS
- Biochemistry* Loss of the calmodulin-dependent inhibition of RyR1 calcium release channel upon oxidation of methionines in calmodulin. *Biochemistry*. 2008 Jan 8;47(1):131-42.  
C.B. BOSCHEK, T.E. JONES, H.S. SMALLWOOD, T.C. SQUIER, and D.J. BIGELOW
- Biochemistry* Identification of a denitrase activity in activated macrophages using high-field LC-FTICR mass spectrometry. *Biochemistry*. 2007 Sep 18;46(37):10498-505.  
H.S. SMALLWOOD, N.M. LOURETTE, C.B. BOSCHEK, D.J. BIGELOW, R.D. SMITH, L. PASA-TOLIC and T.C. SQUIER
- Biochemistry* High-affinity and cooperative binding of oxidized calmodulin by methionine sulfoxide reductase. *Biochemistry*. 2006 Dec 12;45(49):14642-14654.  
Y. XIONG, B. CHEN, H.S. SMALLWOOD, R.J. BIEBER-URBAUER, L. M. MARKILLIE, N. GALEVA, T.D. WILLIAMS, and T.C. SQUIER

## PUBLICATIONS CONTINUED

- Biochemistry* *Increases in calmodulin abundance and stabilization of activated inducible nitric oxide synthase mediate bacterial killing in RAW 264.7 macrophage cells.* *Biochemistry*. 2006 Aug 15;45(32):9717-9726.  
H.S. SMALLWOOD, L. SHI, and T.C. SQUIER
- Journal of Biological Chemistry* *Proteomic analysis of Salmonella enterica serovar typhimurium isolated from RAW 264.7 macrophages: identification of a novel protein that contributes to the replication of serovar typhimurium inside macrophages.* *J Biol Chem*. 2006 Sep 29; 281(39):29131-29140.  
L. SHI, J.N. ADKINS, J.R. COLEMAN, A.A. SCHEPMOES, A. DOHNKOVA, H.M. MOTTAZ, A.D. NORBECK, S.O. PERVINE, N.P. MANES, H.S. SMALLWOOD, H. WANG, J. FORBES, P. GROS, S. UZZAU, K.D. RODLAND, F. HEFFRON, R.D. SMITH, and T.C. SQUIER
- American Journal of Physiology Cell Physiology* *Functional linkage between tumor necrosis factor biosynthesis and calmodulin-dependent activation of iNOS in RAW 264.7 macrophages.* *Am J Physiol Cell Physiol*. 2006 Jun;290(6):C1512-20.  
T.J. WEBER, H.S. SMALLWOOD, L.E. KATHMANN, M. MARKILLIE, T.C. SQUIER and B.D. THRALL
- Biochemistry* *Mediating molecular recognition by methionine oxidation: Conformational switching by oxidation of methionine in the carboxyl-terminal domain of calmodulin.* *Biochemistry*. 2005 Jul 12;44(27):9486-96.  
A. ANBANANDAM, R.J. BIEBER-URBAUER, R.K. BARTLETT, H.S. SMALLWOOD, T.C. SQUIER, and J.L. URBAUER
- Biochemistry* *Calmodulin involvement in stress-activated nuclear localization of albumin in JB6 epithelial cells.* *Biochemistry*. 2004 Jun 15;43(23):7443-50.  
T.J. WEBER, S. NEGASH, H.S. SMALLWOOD, K.S. RAMOS, B.D. THRALL, and T.C. SQUIER
- Chemical Research in Toxicology* *Selective nitration of Tyr99 in calmodulin as a marker of cellular conditions of oxidative stress.* *Chem Res Toxicol*. 2003 Jan;16(1):95-102.  
H.S. SMALLWOOD, N.A. GALEVA, R.K. BARTLETT, R.J. BIEBER-URBAUER, T.D. WILLIAMS, J.L. URBAUER, and T.C. SQUIER
- Biochemistry* *Oxidation of Met144 and Met145 in calmodulin blocks calmodulin dependent activation of the plasma membrane Ca-ATPase.* 2003 Mar 25;42(11):3231-8.  
R.K. BARTLETT, R.J. BIEBER-URBAUER, H.S. SMALLWOOD, J.L. URBAUER, and T.C. SQUIER

## SCIENCE ADVOCACY AND OUTREACH PUBLICATIONS

- High Ground* *Science and art collide happily in Art of Science.* 2014 Sept 24. Amy FRENCH.  
<http://www.highgroundnews.com/features/ArtofScience.092414.aspx>
- Commercial Appeal* *Art Review: Whether literal or radical, interpretations mostly work in 'The Art of Science'.* 2013 Sept 30. Fredric KOEPEL.  
[www.commercialappeal.com/go-memphis/arts/visual-arts-news](http://www.commercialappeal.com/go-memphis/arts/visual-arts-news)
- I Love Memphis* *St. Jude Scientists + Local Artists = Art of Science 2013.* 2013 Sept 30. Holly WHITFIELD. <http://www.ilovememphisblog.com/2013/09/st-jude-scientists-local-artists-art-of-science-2013/>
- Memphis Flyer* *Opening This Week: Art of Science and more.* 2013 Sept 26. Eileen TOWNSEND.  
<http://www.memphisflyer.com/ExhibitM/archives/2013/09/26/opening-this-week-art-of-science-and-more>
- Number* *Art of Science* 2012 Oct 30. Jenny HORBY.  
<http://www.numberinc.org/the-art-of-science/>
- Fortune Magazine* *Best of the Northwest: Scientists Unravel the Mysteries of Cell Biology at Pacific Northwest Laboratory.* 2010 Sept 6;162(S1-8):S8.

## GRANTS AND FUNDING AWARDS

|   |  |
|---|--|
| <i>Loan Repayment Program Award</i>                     | <p>NIH Institute and Center: National Institute of Allergy and Infectious Diseases<br/>PEDIATRIC - EXTRAMURAL</p> <p><i>Age Dependent Changes in Immunodominance and Antigen Presentation</i><br/>Primary Author: <b>Heather S. Smallwood</b><br/>Initial Contract: 7/1/2010 - 6/30/2012<br/>Renewal Contract: 6/30/2012- 7/1/2014</p>   |
| <i>EMSL Awards</i>                                      | <p>NIH National Center for Research Resources (NCRR) center for proteomics<br/>USER PROPOSAL - EXTRAMURAL</p>  |
| <i>EMSL Science Awards</i>                              | <p>SCIENCE THEME: BIOLOGICAL INTERACTIONS AND INTERFACES</p> <p><i>Immunodominance hierarchies in influenza specific T cell responses</i><br/>Proposal Identification Number 34745<br/>Principal: <b>Heather Shannon Smallwood</b> (User ID: 39840)<br/>Contract: 10/1/2009 - 9/30/2012</p> <p><i>Targeted identification of epigenetic determinants of T cell memory</i><br/>Proposal Identification Number 34940<br/>Principal: <b>Heather Shannon Smallwood</b> (User ID: 39840)<br/>Contract: 10/8/2009 - 9/30/2012</p>  |
| <i>EMSL Rapid Access Proposal</i>                       | <p><i>MHC presented peptide quantitation: mass spectrometry methods development</i><br/>Proposal Identification Number 37501<br/>Principal: <b>Heather Shannon Smallwood</b> (User ID: 39840)<br/>Contract: 9/21/2009 - 11/30/2009</p>   |
| <i>EMSL General Access Awards</i>                       | <p><i>Protein complexes altered by oxidative stress and determined by FTICR-MS</i><br/>Proposal Identification Number 25891<br/>Principal: <b>Heather Shannon Smallwood</b> (User ID: 39840)<br/>Contract: 6/5/2007 - 9/30/2009</p> <p><i>Reactive oxygen and nitrogen species, produce dynamic protein modifications and protein complexes in RAW 264.7 macrophage cells</i><br/>Proposal Identification Number 12291<br/>Principal: <b>Heather Shannon Smallwood</b> (User ID: 39840)<br/>Initial Contract: 2/24/2005 - 5/15/2007<br/>Renewal Contract: 6/5/2007 - 9/30/2009</p> |
| <i>Downtown Memphis Commission Special Events Grant</i> | <p>FUNDING FOR THE ART OF SCIENCE: A COLLABORATIVE ART AND SCIENCE EDUCATIONAL OUTREACH PROJECT.</p> <p><i>Get Down Memphis</i>: designed to support and encourage the creative growth and development of ideas and projects that will have a positive impact on downtown Memphis.<br/>Primary Author: <b>Heather S. Smallwood</b></p> <p>INITIAL CONTRACT: 8/1/2012-8/1/2013<br/>Renewal Contract: 8/1/2013-8/1/2014<br/>Renewal Contract: 8/1/2014-8/1/2015</p>  |
| <b>PATENT</b>   |  |
| <i>Provisional Application</i>                          | <p>No. 62/068,561. Coordinated Metabolic Reprogramming in Response to Productive Viral Infection. · 12 potential anti-viral Drugs ·<br/>JOINT INVENTOR (MAJOR CONTRIBUTOR): <b>HEATHER S. SMALLWOOD</b><br/>filed: October 24, 2014</p>  |

## ACHIEVEMENT AWARDS

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| <i>Employee of the Quarter Award</i>    | Sept 2013 · St Jude Children's Research Hospital · Awarded employee of the quarter and admitted into the 5100 Club for developing and organizing <i>The Art of Science</i> community outreach and educational project focused on uniting St. Jude researchers and local artists to inform Memphians on basic research. |
| <i>Ovation Encore Performance Award</i> | Dec 2012 · St Jude Children's Research Hospital · St Jude's highest level of employee performance award for individuals who create opportunities and actively seek innovative solutions to business and workplace challenges. Their accomplishments significantly exceed the scope of their jobs.                      |
| <i>Outstanding Performance Award</i>    | July 2004 · Pacific Northwest National Laboratory · Department of Cell Biologys Outstanding Performance Award: Recipients of this award go beyond their normal duties to benefit the entire department.  |

## COMPUTER AND DATA ANALYSIS SKILLS

|                     |   |
|---------------------|---|
| <i>Basic</i>        | R, L <sup>A</sup> T <sub>E</sub> X, Cytoscape, MEDUSA, & PPI Spider |
| <i>Intermediate</i> | MICROSOFT WINDOWS, SPOTFIRE, PRISM, MINOR3D, & STRING               |
| <i>Advanced</i>     | Excel, & DAVID  |

## SELECTED ORAL &amp; POSTER PRESENTATIONS

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| <i>American Association of Immunologist</i> | May 2015 · Oral and Poster Presentation<br><b>2015 AAI Trainee Award</b><br>American Association of Immunologist, New Orleans LA                              |
| <i>St Jude Poster Session</i>               | Nov 2014 · Poster Presentation<br>St Jude Faculty and Post Doc Poster Session, Memphis TN   |
| <i>Aegean International Conference</i>      | SEPT 2013 · Oral Presentation and Poster Presentation<br><b>2013 Aegean Trainee Award</b><br>2nd International Conference on ImmunoMetabolism, Rhodes, Greece |
| <i>Gordon Research Conference</i>           | MAY 2013 · Poster Presentation<br>Viruses and Cells Gordon Research Conference, Lucca Italy   |
| <i>Aegean International Conference</i>      | SEPT 2011 · Oral and Poster Presentation<br>4th International Conference on Crossroads between Innate and Adaptive Immunity, Elia Greece                      |
| <i>American Association of Immunologist</i> | May 2011 · Oral and Poster Presentation<br>American Association of Immunologists, San Francisco CA  |
| <i>Fancy Gap</i>                            | Oct 2010 · Oral Presentation<br>Fancy Gap Immunoparasitology Conference, Fancy Gap VA   |
| <i>Keystone Symposium</i>                   | May 2010 · Poster Presentation<br>Viral Immunity Keystone, Banff Canada   |
| <i>Fancy Gap</i>                            | Oct 2009 · Oral Presentation<br>Fancy Gap Immunoparasitology Conference, Fancy Gap VA   |
| <i>Protein Society</i>                      | Aug 2006 · <b>Young Investigator Award Lecture</b><br>20th Symposium of the Protein Society, San Diego CA   |
| <i>ASB&amp;MB</i>                           | Apr 2005 · Poster Presentation<br>American Society for Biochemistry and Molecular Biology, San Diego CA   |

## OTHER INFORMATION

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|---|---|
| <i>Chairman of the Board for the UTHSC Proteomics and Metabolomics Core</i> | 2016-present · Chairman of the Board<br>University of Tennessee Health Science Center<br>Oversight of mass spectrometry core opening, operations, and management along with aiding in the development of standard operating procedures and user platform. Organize and execute quarterly board meetings, prepare progress reports and business plans.   |
| <i>Teaching Experience</i>  | 2007-2008 · Teaching Assistant<br>Washington State University-TriCities Campus<br>Developed a curriculum for and taught an undergraduate and graduate level course in Radiation Biology resulting in a peer reviewed publication for interested students (i.e. Smallwood et al. 2009 published in Chemical Research in Toxicology).   |
| <i>Distinguishing Community Service</i>                                     | 2010-present · Art of Science, Co-Founder and Board President<br>Art of Science is a community education and outreach program for St Jude Children's Research Hospital. The art of Science features scientific data from St Jude researchers interpreted by local artists and displayed in a yearly interactive public art and science exhibition.<br><br>2010-2011 · Math Tutor<br>Bellevue Middle School, Memphis TN<br><br>2003-2007 · Science Fair Judge<br>Carmichael Middle School, Richland WA |
| <i>Interests</i>  | Art · Cooking · Sailing · Philosophy · Science Advocacy   |

## REFERENCES

|   |  |
|---|--|
| <i>St. Jude Children's Research Hospital<br/>262 Danny Thomas Place<br/>Memphis, TN<br/>38105</i> | 2004–Present     Paul Thomas PhD · FACULTY MEMBER<br>Department IMMUNOLOGY · +1 (901) 595 6507 · <a href="mailto:paul.thomas@stjude.org">paul.thomas@stjude.org</a>  |
|   | 1988–Present     Peter Doherty PhD · FACULTY MEMBER<br>Nobel Laureate and Michael F. Tamer Chair of St. Jude Biomedical Research<br>Department IMMUNOLOGY · +1 (901) 595 3470 · <a href="mailto:peter.doherty@stjude.org">peter.doherty@stjude.org</a>   |
|   | 2005–Present     Douglas Green PhD · FACULTY MEMBER<br>Chair of Immunology and Peter C. Doherty Endowed Chair of Immunology<br>Department IMMUNOLOGY · +1 (901) 595 3470 · <a href="mailto:douglas.green@stjude.org">douglas.green@stjude.org</a>  |
| <i>Pacific Northwest National Lab 3335<br/>Innovation Blvd<br/>Richland, WA<br/>99354</i>         | 1995–Present     Ljiljana Pasa-Tolic PhD · FACULTY MEMBER<br>Lead and Group Manager Mass Spectrometry for the Environmental Molecular Sciences Laboratory · Office of Biological and Environmental Research<br>Department OF ENERGY · +1 (509) 371-6585 · <a href="mailto:ljiljana.pasatolic@pnl.gov">ljiljana.pasatolic@pnl.gov</a> |

RECOMMENDATION LETTERS AVAILABLE ON REQUEST

May 23, 2017