

UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES
GRADUATE FACULTY APPLICATION

1. Name: Michael Robeson
2. UAMS Graduate Program Sponsor: Biomedical Informatics Major field: Biomedical Informatics
3. Present UAMS academic title or administrative position: COM Assistant Professor
- Date appointed this rank/position: July 2017 Employed by: COM-Bioinformatics Informatics

4. Comments of Department Chair/Head or Program Director including: evidence of scholarly development, effectiveness as a teacher, quality of publications and reallocation of duties if this application is approved.

Michael is a new assistant professor who obtained his PhD at Colorado in Evolutionary Biology. He conducted two postdocs including one at Oak Ridge with Dr. David Ussery, another new faculty member in Biomedical Informatics.

He currently has 26 manuscripts and is working on a number of grant submissions currently underway in the department.

Fred Prior/Meredith Zozus

October 30, 2017

Meredith Zozus

Department Chair/Head or Program Director

Date

Graduate Council Representative

I have read the comments of my Department Chair/Head or Program Director and I do, do not (circle one) wish to supply additional information in support of my application.

Michael Robeson
Applicant's Signature

October 30, 2017
Date

Approvals

G. Boyd
Chair, Graduate Faculty Committee

11/15/17
Date

E C Pitt
Chair, Graduate Council

11/15/17
Date

Robert B. Howard
Dean of the Graduate School

10/30/17
Date

5. **List your planned involvement in graduate education (courses, theses, dissertations):**

Michael will begin teaching immediately in a number of the new BINF courses in the new graduate program. He will also be the course director for 2 of the new one credit hour courses. He will begin serving immediately on student dissertation committees, with goal of becoming a major advisor in the near future.

6. **Briefly summarize your experience in graduate-level classroom teaching:**

Most of his teaching has been as a guest lecturer, and teaching assistant at USF-Tampa, and Colorado University-Boulder.

7. **Briefly summarize your experience in research and student research mentoring:**

8. **Attach Curriculum Vita** showing educational background (including institutions attended, degrees awarded and dates), honors or awards received, scholarly or professional organization affiliations, teaching experience (give school, dates and advanced and graduate subjects taught), including student theses and/or dissertations supervised. Cite publications and research in progress.

Michael Scott Robeson II, Ph.D.

RESEARCH EMPHASIS

I bring together my broad experience from working in and consulting for academics, government, public health, industry, and academic research projects to study the effects of the microbiome on host health. I leverage my skills from bioinformatics, evolutionary biology, phylogenetics, metagenomics, microbial ecology and microbiome science to investigate host-microbiome interactions.

EDUCATION

2012 Ph.D. Biology University of Colorado, Ecology and Evolutionary Biology
2001 M.S. Zoology University of South Florida, Biology
1997 B.S. Biochemistry University of Tampa, Chemistry

PROFESSIONAL EXPERIENCE

2017 – current *Assistant Professor*, University of Arkansas for Medical Sciences, Department of Biomedical Informatics, College of Medicine, Arkansas Center for Genomic Epidemiology and Medicine.
2016 – 2017 *Founder & CSO* of Interstitial Genomics, LLC
2014 – 2016 *Post-doc*, Joint Colorado State University & National Wildlife Research Center, USDA, Fort Collins, CO
2012 – 2014 *Post-doc*, Oak Ridge National Laboratory, Oak Ridge, TN
2003 – 2004 *Research Associate*, Center for Biological Defense, University of South Florida, Tampa, FL
2001 – 2003 *Research Assistant*, Center for Biological Defense, University of South Florida, Tampa, FL
1997 – 2001 *Departmental Sequencing Technician*, University of South Florida, Tampa, FL
1997 – 2001 *TA*, University of South Florida, Tampa, FL
2004 – 2012 *TA*, University of Colorado, Boulder, CO

AWARDS

2005-2006 National Science Foundation GK-12 Fellowship

FUNDING

2004 – 2012 Several CU Boulder EBIO departmental graduate student grants.
2016 – Current Funds acquired through my company Interstitial Genomics, LLC.

PUBLICATIONS (* Denotes equal contribution)

26. AS Andrei, A Baricz, **MS Robeson**, MR Păușan, T Tămaș, C Chiriac, E Szekeres, L Barbu-Tudoran, EA Levei, C Coman, M Podar, HL Banciu (2017) Hypersaline sapropels act as hotspots for microbial dark matter. SCIENTIFIC REPORTS. DOI:10.1038/s41598-017-06232-w.
25. R Johansen, P Johnston, P Mieczkowski, G Perry, **MS Robeson**, R Vilgalys, B Burns (2017) "Scattered far and wide: a broadly distributed dune grass finds familiar fungal root associates in its invasive range." SOIL BIOLOGY AND BIOCHEMISTRY 112:177-190.
24. AJ King*, SP Preheim*, KL Bailey*, **MS Robeson**, TR Chowdhury, BR Crable, RA Hurt, T Mehlhorn, KA Lowe, TJ Phelps, AV Palumbo, CC Brandt, SD Brown, M Podar, P Zhang,

- WA Lancaster, F Poole, DB Watson, MW Fields, JM Chandonia, EJ Alm, J Zhou, MWW Adams, TC Hazen, AP Arkin, DA Elias (2017) "Temporal Dynamics of In-Field Bioreactor Populations Reflect the Groundwater System." ENVIRONMENTAL SCIENCE & TECHNOLOGY DOI: 10.1021/acs.est.6b04751
23. RC Kennedy*, RR Fling*, **MS Robeson**, AM Saxton, RL Donnell, DA Bemis, J Liu, L Zhao, JL Darcy, J Chen (2016) "Temporal dynamics of the gut microbiota in triclocarban exposed pregnant and neonatal rats." SCIENTIFIC REPORTS 6:33430
 22. D Pelletier, S Utturkar, WN Cude, **MS Robeson**, Z Yang, D Klingeman, M Land, S Allman, TY Lu, S Brown, C Schadt, M Podar, M Doktycz (2016) "Enrichment of root endophytic bacteria from *Populus deltoides* and single-cell genomics analysis." APPLIED AND ENVIRONMENTAL MICROBIOLOGY 82(18): 5698-5708
 21. R Johansen, P Johnston, P Mieczkowski, GL Perry, **MS Robeson**, BR Burns, R Vilgalys (2016) "A native and an invasive dune grass share similar, patchily distributed, root-associated fungal communities." FUNGAL ECOLOGY 23:141-155
 20. G Bergmann, J Craine, **MS Robeson**, N Fierer (2015) "Seasonal shifts in diet and gut microbiota in the American bison (*Bison bison*)." PLOS ONE: 10(11): e0142409.
 19. CM Timm, AG Campbell, SM Utturkar, S Jun, RE Parales, WA Tan, **MS Robeson**, TYS Lu, S Jawdy, SD Brown, DW Ussery, CW Schadt, GA Tuskan, MJ Doktycz, DJ Weston, DA Pelletier (2015) "Metabolic functions of *Pseudomonas fluorescens* strains from *Populus deltoides* depend on rhizosphere or endosphere isolation compartment." FRONTIERS IN MICROBIOLOGY: 6:1118.
 18. SR Jun, **MS Robeson**, LJ Hauser, CW Schadt, AA Gorin (2015) "PanFP: Pangenome-based functional profiles for microbial communities" BMC RESEARCH NOTES: 8:479
 17. AS Andrei*, **MS Robeson***, A Baricz , C Coman, V Muntean, A Ionescu, G Etiope, M Alexe, CI Sicora, M Podar, HL Banciu (2015) "Contrasting taxonomic stratification of microbial communities in two hypersaline meromictic lakes." THE ISME JOURNAL: doi:10.1038/ismej.2015.60
 16. C Coman, CM Chiriac, **MS Robeson**, C Ionescu, N Dragoş, L Barbu-Tudoran, AS Andrei, HL Banciu, C Sicora, M Podar (2015) "Structure, mineralogy and microbial diversity of geothermal spring microbialites associated with a deep oil drilling in Romania" FRONTIERS IN MICROBIOLOGY: 6:253
 15. N Mahmoudi, **MS Robeson**, HF Castro, JL Fortney, SM Techtmann, DC Joyner, CJ Paradis, SM Pfiffner, TC Hazen (2015) "The diversity of microbial communities in the sediments of the Caspian Sea." FEMS MICROBIOLOGY ECOLOGY: 91(1):1-11
 14. RA Hurt, **MS Robeson**, M Shakya, JG Moberly, TA Vishnivetskaya, B Gu, D Elias (2014) "Improved yield of high molecular weight DNA coincides with increased microbial diversity access from iron oxide cemented sub-surface clay environments." PLOS ONE: 9(7):e102826
 13. G Bonito, H Reynolds, **MS Robeson**, J Nelson, BP Hodkinson, G Tuskan, CW Schadt, R Vilgalys (2014) "Plant host and soil origin influence fungal and bacterial assemblages in the roots of woody plants." MOLECULAR ECOLOGY: 23(13):3356-3370.
 12. SJ McCauley, CJ Davis, EE Werner, **MS Robeson** (2014) "Dispersal, niche breadth and population extinction: colonization ratios predict range size in North American dragonflies." JOURNAL OF ANIMAL ECOLOGY 83:858-865.
 11. A Gonzalez, AJ King, **MS Robeson**, S Song, A Shade, JL Metcalf, R Knight. (2012) "Characterizing Microbial Communities Through Space and Time." CURRENT OPINION IN BIOTECHNOLOGY: 23(3): 431-436.
 10. JL Darcy, RC Lynch, AJ King, **MS Robeson** and SK Schmidt. (2011) "Global Distribution of *Polaromonas* Phylotypes – Evidence for a Highly Successful Dispersal Capacity." PLOS

9. **MS Robeson**, AJ King, KR Freeman, CW Birky, AP Martin, SK Schmidt (2011) "Soil rotifer communities are extremely diverse globally but spatially autocorrelated locally." PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 108(11): 4406-4410
8. SK Schmidt, RC Lynch, AJ King, D Karki, **MS Robeson**, L Nagy, MW Williams, MS Mitter, KR Freeman (2010) "Phylogeography of microbial phototrophs in the dry valleys of the high Himalayas and Antarctica." PROCEEDINGS OF THE ROYAL SOCIETY B 278(1706):702-708
7. **MS Robeson**, EK Costello, KR Freeman, J Whiting, B Adams, AP Martin, SK Schmidt (2009) "Environmental DNA sequencing primers for eutardigrades and bdelloid rotifers." BMC ECOLOGY 9:25
6. SR Sattin, CC Cleveland, E Hood, SC Reed, Andrew J King, SK Schmidt, **MS Robeson**, N Ascarrunz and DR Nemergut. (2009) "Functional shifts in unvegetated, perhumid, recently deglaciated soils do not correlate with shifts in soil bacterial community composition." THE JOURNAL OF MICROBIOLOGY 47(6):673-681
5. KR Freeman, MY Pescador, SC Reed, EK Costello, **MS Robeson** and SK Schmidt (2009) "Soil CO₂ flux and photoautotrophic community composition in high-elevation, 'barren' soil." ENVIRONMENTAL MICROBIOLOGY 11:3 674-686
4. RT Jones, **MS Robeson**, CL Lauber, M Hamady, R Knight and N Fierer (2009) "A comprehensive survey of soil acidobacterial diversity using pyrosequencing and clone library analyses." THE ISME JOURNAL. 3:442-453
3. DR Nemergut, **MS Robeson**, RF Kysela, AP Martin, SK Schmidt and R Knight (2008) "Insights and inferences about integron evolution from genomic data." BMC GENOMICS. 9:261
2. N Fierer, M Breitbart, J Nulton, P Salamon, C Lozupone, R Jones, **MS Robeson**, RA Edwards, B Felts, S Rayhawk, R Knight, F Rohwer, and RB Jackson (2007) "Metagenomic and Small-Subunit rRNA Analyses Reveal the Genetic Diversity of Bacteria, Archaea, Fungi, and Viruses in Soil." APPLIED AND ENVIRONMENTAL MICROBIOLOGY. 73(21):7059-7066
1. R Knight, P Maxwell, A Birmingham, J Carnes, JG Caporaso, BC Easton, M Eaton, M Hamady, H Lindsay, Z Liu, C Lozupone, D McDonald, **MS Robeson**, R Sammut, S Smit, MJ Wakefield, J Widmann, S Wikman, S Wilson, H Ying and GA Huttley (2007) "PyCogent: a toolkit for making sense from sequence." GENOME BIOLOGY 8:R171

MANUSCRIPTS IN CURRENTLY IN REVIEW (* Denotes equal contribution)

- m3. JL Darcy, AD Washburne, **MS Robeson**, T Prest, SK Schmidt (*SUBMITTED*) "A phylogenetic model for the arrival of species into microbial communities." ISME J.
- m2. JE Knelman, EB Graham, JS Prev y, **MS Robeson**, P Kelly, E Hood, SK Schmidt (*SUBMITTED*) "Interspecific plant interactions occur via influence on soil bacterial community structure and nitrogen cycling in primary succession." Frontiers in Microbiology.
- m1. **MS Robeson**, K Khanipov, G Golovko, SM Wisely, M White, M Bodenchuck, TJ Smyser, Y Fofanov, N Fierer, A Piaggio (*SUBMITTED*) "Assessing ecoregional differences in wild pig (*Sus scrofa*) diets via DNA sequencing." Ecology and Evolution

SKILLS

DNA cloning, DNA extraction, PCR, DNA sequencing. Microbiome analyses with QIIME, mothur, and phyloseq packages. SAMtools Bcftools, SNP calling, and various other metagenomics analysis tools.

Coding and data analysis using python and R. Phylogenetics analyses. Project management and logistics, manuscript writing.

INVITED TALKS

- it4. "Understanding the root microbiome of Poplars." University of Wyoming, Botany Department. April 10th 2015
- it3. "Understanding the *Populus* root microbiome." University of Richmond, Biology Department. February 3rd, 2014
- it2. "Understanding the diversity and distribution of bdelloid rotifer soil communities." Duke University. April 30th, 2013
- it1. "Detection and Typing of Bioterrorism agents in food: Molecular Approaches." Florida Association of Food Protection (F.A.F.P.), April 3rd 2003.

TALKS

- t5. "A metagenomic and marker gene survey of the feral swine gut: What's in there and what are they eating?" National Wildlife Research Center, USDA-APHIS, July 17th 2015
- t4. Presented quarterly updates to the Department of Energy (DOE) / Oak Ridge National Laboratory (ORNL) on my research for the Plant-Microbe Interfaces Scientific Focus Area (PMI-SFA)
- t3. Presented my dissertation work annually at the Guild of Rocky Mountain Ecologists and Evolutionary Biologists (GREEBs). Hosted at the Mountain Research Station (MRS) in Boulder CO.
- t2. "Analysis of Ba813 DNA Sequence from Several *Bacillus* sp. Isolates." Bio-terrorism Consortium meeting (Lubbock, TX) April 30th, 2003.
- t1. "Bio-terrorism Preparedness and Response." Association of Public Health Laboratories (A.P.H.L.) & The Center for Disease Control and Prevention (C.D.C), CDC-PulseNet Update Meeting, Ann Arbor, MI April 8th, 2002.

POSTERS

- p24. R Fling, R Kennedy, **MS Robeson**, D Bemis, L Zhao, N Gee, B Lasley, J Chen "3,4,4'-Trichlorocarbanilide Exposure Induces Gut Microbial Dysbiosis in Weaned Rats." General Meeting of the American Society for Microbiology, May 30-June 2, 2015
- p23. AJ King, KL Bailey, PP Sarah, **MS Robeson**, TR Chowdhury, BR Crable, RA Hurt, AC Somenahally, SM Tecthmann, TL Mehlhorn, KA Lowe, AM Rocha, A Zelaya, W Fields, AP Arkin, JM Chandonia, EJ Alm, J Zhou, TJ Phelps, CC Brandt, SD Brown, M Podar, MWW Adams, DB Watson, DA Elias "Groundwater-fed Bioreactors Show Distinct Colonization and Perturbation Community Dynamics" General Meeting of the American Society for Microbiology, May 30-June 2, 2015
- p22. **MS Robeson**, ZK Yang, M Shakya, GM Bonito, M Podar, W Muchero, S Tringe, GATuskan, R Vilgalys, C Schadt "Does *Populus trichocarpa* genotype affect its own microbiome?" General Meeting of the American Society for Microbiology, May 17-20, 2014
- p21. N Mahmoudi, **MS Robeson**, SM Tecthmann, S Pfiffner, S Stelling, JL Fortney, DC Joyner, TC Hazen "Diversity and function of microbial communities in the Caspian Sea" General Meeting of the American Society for Microbiology, May 17-20, 2014
- p20. N Cude, **MS Robeson**, ZK Yang, SL Allman, TYS Lu, M Podar, CW Schadt, DA Pellitier "A protocol for the enrichment of live bacterial endophytes from *Populus deltoides* for metagenomics and single-cell genomics." General Meeting of the American Society for

Mirobiology, May17-20, 2014

- p19. **MS Robeson**, ZK Yang, M Kerley, M Podar, M Shakya, GM Bonito, GA Tuskan, R Vilgalys, C Schadt "Does *Populus deltoides* select for a unique microbiome?" Ecological Society of America Annual Meeting, August 3-9, 2013
- p18. JR Rideout, A Gonzalez, A Cochran, D Coy, M Dwan, A King, L Knecht, D Knights, J Kuczynski, L McCracken, J Metcalf, L Parfrey, B Prithiviraj, **MS Robeson**, W Van Treuren, JC Clemente, R Knight, JG Caporaso "Distance-Based Biogeographical Analyses Differ in Their Ability to Provide Insight Into Microbial Ecology" Sloan Conference on the Microbiology of the Built Environment May 22-24, 2013
- p17. **MS Robeson**, ZK Yang, M Kerley, M Podar, M Shakya, GM Bonito, GA Tuskan, R Vilgalys, C Schadt "Does *Populus deltoides* Select for Unique Microbial Communities Among Adjacent Heterospecific Trees?" 113th General Meeting of the American Society for Mirobiology, May18-21, 2013
- p16. **MS Robeson**, AJ King, JL Darcy, RC Lynch, SK Schmidt. "Are bdelloid rotifer communities structured by soil biogeochemistry and bacterial composition?" American Society for Microbiology General Meeting May 20-24, 2011 New Orleans.
- p15. JL Darcy, RC Lynch, AJ King, **MS Robeson**, SK Schmidt "Global Distribution of Polaromonas Phylotypes: Evidence for a Highly Successful Dispersal Capacity." ASM Rocky Mountain Branch Spring Meeting March 2011 Boulder, CO
- p14. KR Freeman, Y Pescador, SC Reed, **MS Robeson**, SK Schmidt. "Coil CO₂ Flux and Photoautotrophic Community Composition in High-Altitude, Barren Soils." Arctic and Alpine Microbiology Conference, Banff, Canada June 2008
- p13. CR Davis, LC Heller, KK Peak, DL Wingfield, CL Goldstein-Hart, DW Bodager, **MS Robeson**, AC Cannons, PT Amuso, J Cattani. "Molecular and Physical Characterization of an Outbreak Related Strain of *Vibrio parahaemolyticus*." American Society of Microbiology General Meeting, May 18-22, 2003 Washington DC.
- p12. A Tatavarthy, LC Heller, CR Davis, KK Peak, **MS Robeson**, JS Gullede, AC Cannons, PT Amuso, J Cattani. "Detection and Subtyping of *Salmonella* spp. by Real-Time PCR, RiboPrinting and Pulse Field Gel Electrophoresis." American Society of Microbiology General Meeting, May 18-22, 2003 Washington DC.
- p11. KK. Peak, VA Luna, L Heller, W Veguilla, DS King, **MS Robeson**, F Reeves, L Heberlein-Larson, A Cannons, P Amuso, J Cattani. "The Development of a Culture Collection of Authenticated *Bacillus* spp, including *B. anthracis*, Isolated from Suspicious Samples and Regional Soil Samples." University of South Florida College of Public Health "HSC Research Day", February 13, 2003 and the Bio-terrorism Consortium meeting (Lubbock, TX) April 30. American Society of Microbiology General Meeting 2003.
- p10. VA Luna, L Heller, DS King, KK Peak, **MS Robeson**, K Skibicka, A Tatavarthy, F Reeves, A Cannons, P Amuso, J Cattani. "DNA Fingerprining and Phenotypes of 50 *Bacillus* spp. Isolated from Forensic Samples from October through December 2001." American Society of Microbiology General Meeting, May 18-22, 2003 Washington DC.
- p9. KK Peak, VA Luna, L Heller, W Veguilla, DS King, **MS Robeson**, F Reeves, L Heberlein-Larson, A Cannons, P Amuso, and J Cattani. "The Development of a Culture Collection of Authenticated *Bacillus* spp, including *B. anthracis*, Isolated from Suspicious Samples and Regional Soil Samples." American Society of Microbiology General Meeting, May 18-22, 2003 Washington DC.
- p8. VA Luna, L Heller, K Skibicka, A Tatavarthy, DS King, KK Peak, **MS Robeson**, F Reeves, A Cannons, P Amuso, J Cattani. "The Molecular and Phenotypic Characterization of

- Bacillus* Species Isolated from Forensic Samples from October through December of 2001 in Central Florida." 2003.
- p7. Health Sciences Center – Research Day “Analysis of Ba813 DNA sequence from several *Bacillus sp.* isolates”, February 13, 2003.
- p6. VA Luna, DS King, **MS Robeson**, M Ewert, P Amuso, A Cannons, KK Peak, C Davis, L Heller, D Wingfield, and J Cattani. “Rapid Identification of *Bacillus anthracis* Spores in Low Concentrations in Clinical and Environmental Specimens by Real-time PCR.” American Society of Microbiology General Meeting, May 19-23, 2002 Salt Lake City, UT.
- p5. M Ewert, VA Luna, **MS Robeson**, P Amuso, A Cannons, C Davis, L Heller, D King, KK Peak, D Wingfield, and J Cattani. “Rapid Presumptive PCR-Based Identification of *Bacillus anthracis* in Human Blood.” American Society of Microbiology General Meeting, May 19-23, 2002 Salt Lake City, UT.
- p4. **MS Robeson**, VA Luna, DS King, M Ewert, P Amuso, A Cannons, C Davis, L Heller, KK Peak, D Wingfield "Assessment of the Utility of Automated Ribotyping for Surveillance and Molecular Characterization of Bioterrorism Agents", American Society of Microbiology General Meeting May 22, Spring 2002.
- p3. Society for Integrative and Comparative Biology (S.I.C.B.), Masters research, Spring 2001.
- p2. Association of Southeastern Biologists (A.S.B.), Masters research, Spring 1999.
- p1. Institute for Biomolecular Science (I.B.S.) at U.S.F., Masters research, Summer 1998.

TEACHING EXPERIENCE

Guest Lecturer: “Analyzing microbiome data”. Microbiome class at Colorado State University, January 20th, 2016.

Guest Lecturer: “Analyzing microbiome data using QIIME.” Microbiology class at Washington State University, October 20th, 2016

Guest Lecturer: “Analyzing microbiome data.” Microbiology class at University of Tennessee, Knoxville. March 29th, 2014

High School Lecturer: CU Boulder, NSF-GK12, Boulder Valley School District, 2005-2006

Teaching assistant: CU Boulder, CO, non-majors Biology Lab 1050, General Biology Labs 1240 & 1250, Evolution Lab 3080, and Microbiology Lab 3400

Teaching assistant: USF, Tampa, FL, General Chemistry 2045L; Cellular Processes 2010L; Genetics 3063L

PUBLIC OUTREACH

Evolution & Climate Change Outreach: 2006-2009, CU Boulder, EBIO, Committee member.

POPULAR MEDIA & PRESS

Lab Manager: May, 8th, 2017 “How to build the most productive relationship with your IT team” (<http://www.labmanager.com/leadership-and-staffing/2017/05/how-to-build-the-most-productive-relationship-with-your-it-team>)

Science Daily: April 1st, 2016 “Chemical in antibacterial soap may disrupt mix of organisms in digestive tract.” (<https://www.sciencedaily.com/releases/2016/04/160401111901.htm>)

Ars Technica: April 9th, 2016 “Mounting data suggest antibacterial soaps do more harm than good.” (<https://arstechnica.com/science/2016/04/mounting-data-suggest-antibacterial-soaps-do-more-harm-than-good/>)

Image of myself on text book cover: August 19th, 2003 “Microbiology, 3rd Edition” by Daniel Lim.

News-Press Fort Myers, Florida: June 17, 1995, “Fins to the left, fins to the right.” Mote Marine Laboratory Internship

Bradenton Herald, Florida: 1995, “Ailing turtle takes it slow.” Mote Marine Laboratory Internship