BIOGRAPHICAL SKETCH

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NAME: Robert Allen Britton

eRA COMMONS USER NAME (credential, e.g., agency login): MSUBRITTONR

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Nebraska	B.S.	1985-1989	Biology
Baylor College of Medicine	Ph.D.	1990-1996	Cell and Molecular Biology
Massachusetts Institute of Technology	Postdoc	1996-2002	Bacterial genetics/genomics

A. Personal Statement. The role of bacteria in human and animal health has undergone a renaissance in the past decade. The overall focus of my laboratory is therapeutic microbiology, in which we aim to develop both traditional probiotic bacterial strains for the prevention and treatment of disease as well as engineer bacterial communities to express therapeutic proteins. During my PhD work under James Lupski at Baylor College of Medicine and my postdoctoral training under Alan Grossman at MIT I received excellent training in microbial genetics, physiology and genomics. I trained extensively in both Gram-negative and Gram-positive model systems and it is this expertise that I now bring to the current work in the areas of probiotic bacteria and the intestinal microbiota. My laboratory has been investigating microbial community structure and function using next generation sequencing technology to address how microbial ecology impacts health. We also have developed powerful genetic tools for the exploration of mechanistic insights into the benefits of probiotic lactic acid bacteria. Recently, we have invented human fecal Mini-Bioreactor Arrays (MBRAs) to investigate how human intestinal microbiota interacts with *C. difficile* as well as a humanized microbiota (Hmb) mouse model of *C. difficile* disease. The MBRAs completely reproduce the *C. difficile* invasion dynamics that are observed in humans and animal models as well as other aspects of human intestinal communities. We also use MBRAs to study microbiome:diet interactions, drug metabolism by the microbiota and other infectious disease interactions with microbial communities. Thus, I am well-positioned to act at Co-PI on this proposal.

B. Positions and Honors

Positions and Employment

1988-1990	Research Assistant with Robert Klucas, Ph.D., in the Dept. of Biochemistry, Univ. of Nebraska, Lincoln, NE.
1989-1990	Research Assistant with Anne Vidaver, Ph.D., in the Dept. of Plant Pathology, Univ. of Nebraska, Lincoln, NE.
1995	Guest Researcher in the laboratory of Dr. Donald Court, Laboratory of Chromosome Biology and Gene Expression, NCI/FCRDC, Frederick, MD.
1991-1996	Completed Ph.D. Thesis Research with James R. Lupski, M.D./Ph.D., Dissertation Title: Suppressor Analysis of *E. coli dnaG* Mutations. Baylor College of Medicine, Houston, TX.

1996-2002	Postdoctoral fellow in the laboratory of Dr. Alan Grossman, Department of Biology, MIT, Cambridge, MA.
2003-2008	Assistant Professor, Department of Microbiology and Molecular Genetics, Michigan State University, East Lansing, MI.
2008-2014	Associate Professor, Department of Microbiology and Molecular Genetics, Michigan State University, East Lansing, MI.
2014-2014	Professor, Department of Microbiology and Molecular Genetics, Michigan State University, East Lansing, MI.
2014-present	Professor, Department of Molecular Virology and Microbiology; Member, Center for Metagenomics and Microbiome Research, Baylor College of Medicine, Houston, TX.

Professional Memberships

1999-present	American Society for Microbiology

Honors and Service

2016	International Ocular Surface Society Award Lecture, Seattle, WA.
2010	Teacher-Scholar Award, College of Natural Science, Michigan State University
2009	NSF Fall Genetics Panel, Reviewer
2008-present	Participant in the Joint Genomes Institute Undergraduate Annotation Research Initiative.
2005-2010	Editor, Gene – Functional Genomics
2006-2009	Delegate, International Society of Probiotics and Prebiotics
2005-2007	Scientific Foundation of Ireland, Reviewer, Genetic Panel and Equipment grants
2000-2002	Co-director of the MIT Microarray Club.
1994	O.B. Williams Award Winner, Best Oral Presentation, Texas Branch American Society for Microbiology.

C. Contributions to science.

3. Investigating the interaction between the intestinal microbiota and *Clostridium difficile*. We are interested in understanding how the intestinal microbiota provides a barrier to incoming pathogens and how perturbations of the microbiota result in an established infection.

1. Collins J, Robinson C, Danhof H, Knetsch CW, van Leeuwen HC, Lawley TD, Auchtung JM, **Britton RA.** (2018) Dietary trehalose enhances virulence of epidemic *Clostridium difficile*. Nature. 2018 Jan 18;553(7688):291-294. doi: 10.1038/nature25178. Epub 2018 Jan 3. PMID: 29310122

2. Robinson CD, Auchtung JM, Collins J, **Britton RA**. (2014). Epidemic *Clostridium difficile* Strains Demonstrate Increased Competitive Fitness Compared to Nonepidemic Isolates. Infect Immun. 2014 Jul;82(7):2815-25. doi: 10.1128/IAI.01524-14. Epub 2014 Apr 14

3. Collins J, Auchtung JM, Schaefer L, Eaton KA, **Britton RA**. (2015). Humanized microbiota mice as a model of recurrent *Clostridium difficile* disease. Microbiome. 2015 Aug 20;3:35. doi: 10.1186/s40168-015-0097-2

4. Auchtung JM, Robinson CD, **Britton RA**. (2015). Cultivation of stable, reproducible microbial communities from different fecal donors using minibioreactor arrays (MBRA). Microbiome. 2015 Sep 30;3:42. doi: 10.1186/s40168-015-0106-5. PMID: 26419531.

Full publication record available at:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1TKIVdmmlv5/bibliography/41856232/public/?sort=date&direction=descending

D. Research Support (selected)

Ongoing research support:

U19AI116482 (Britton - collaborator) 3/1/15 – 2/29/20
NIH/NIAID
Engineered human intestinal organoids: a modular system to model enteric disease
The goal of this project is to interface human intestinal organoids with intestinal microbes.

U01 AI124290-01 9/1/16-8/31/21
NIH/NIAID (Savidge, Britton, Sorg, Garey, Iliopoulus multi-PI)
Decoding antibiotic-induced susceptibility to *Clostridium difficile* infection
The goal of this project is to study *C. difficile* pathogenesis using a systems biology approach.