CURRICULUM VITAE

BENJAMIN K. JOHNSON

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Education

Ph.D.	Michigan State University	2016	Microbiology and Molecular Genetics
B.S.	Calvin College	2011	Biology; Biochemistry

Positions

2017-	Bioinformatics Research Scientist, Van Andel Research Institute, Grand Rapids, MI
2016-2017	Bioinformatics Scientist, Van Andel Research Institute, Grand Rapids, MI
2011-2016	Graduate Research Assistant, Michigan State University, East Lansing, MI
2007-2011	Undergraduate Research Assistant, Calvin College, Grand Rapids, MI

Awards and Honors

2016	Hsiung-Kimball Award, Michigan State University
2015	Rudolph Hugh Fellowship, Michigan State University
2010-2011	National Science Foundation Scientific Computing Scholarship
2010-2011	Henry Bengelink Scholarship, Department of Biology, Calvin College
2007-2011	Knollcrest Scholarship, Calvin College
2010	Teaching Assistant selected to train faculty involved in the Science Education Alliance (SEA) HHMI Mycobacteriophage Research Laboratory, HHMI Janelia Farms Research Campus
2007	Presidential Scholarship, Calvin College

Publications and Book Chapters

1. **Johnson BK** and Abramovitch RB (2017) Small molecules that sabotage bacterial virulence. ***Trends in Pharmacological Sciences*** doi: 10.1016/j.tips.2017.01.004
   Featured Review and received the cover for April issue.

2. Dues DJ, Schaar CE, **Johnson BK**, Bowman MJ, Winn ME, Van Raamsdonk J (2017) Uncoupling of Oxidative Stress Resistance and Lifespan in Long-lived *isp-1* Mitochondrial Mutants in *Caenorhabditis elegans*. ***Free Radical Biology & Medicine*** doi: 10.1016/j.freeradbiomed.2017.04.004
3. Zheng HZ, Colvin CJ, **Johnson BK**, Kirchhoff PD, Wilson M, Jorgensen-Muga K, Larsen

SD, Abramovitch RB (2017) Inhibitors of *Mycobacterium tuberculosis* DosRST signaling and persistence. ***Nature Chemical Biology*** doi:10.1038/nchembio.2259

4. Williams EA, Mba Medie F, Bosserman RE, **Johnson BK**, Reyna C, Ferrell MJ, Champion MM, Abramovitch RB, Champion PA (2017) A nonsense mutation in *Mycobacterium marinum* that is suppressible by a novel mechanism. ***Infection and Immunity*** doi: 10.1128/IAI.00653-16

5. Coulson GB[#], **Johnson BK**[#], Colvin CJ, Fillinger RJ, Zheng HZ, Haiderer ER, Hammer ND, Abramovitch RB (2016) Acidic pH-dependent depletion of *Mycobacterium tuberculosis* thiol pools potentiates antibiotics and oxidizing agents ***Biorxiv doi***: https://doi.org/10.1101/095448
# Co-first authors, contributed equally to this paper

6. Harlow ML, Maloney N, Roland J, Guillen-Navarro MJ, D'Incalci M, Easton M, Madaj ZB, **Johnson BK**, Bowman MB, Winn ME, Turner L, Hostetter G, Galmarini CM, Aviles P, Grohar PJ (2016) Lurbinectedin inactivates the Ewing sarcoma oncoprotein EWS-FLI1 by redistributing it within the nucleus. ***Cancer Research*** 76 (22), 6657-6668

7. **Johnson BK**, Scholz MB, Teal TK, Abramovitch RB (2016) SPARTA: Simple Program for Automated reference-based bacterial RNA-seq Transcriptome Analysis. ***BMC Bioinformatics*** 17 (1)1:4

8. **Johnson BK**, Colvin CJ, Needle DB, Mba Medie F, Champion PAD, and Abramovitch RB (2015) The carbonic anhydrase inhibitor ethoxzolamide inhibits the *Mycobacterium tuberculosis* PhoPR-regulon and Esx-1 secretion and attenuates virulence. ***Antimicrobial Agents and Chemotherapy***, 59:4436–4445
   -- Highlighted in ***MSU today*** (July 23, 2015)
   -- Highlighted as a News and Analysis Research Briefing in ***The Pharmaceutical Journal*** (August 9, 2015)

9. **Johnson BK** and Abramovitch RB (2015). Macrophage Infection Models for *Mycobacterium tuberculosis*. ***Methods in Molecular Biology: Mycobacteria Protocols, Third Edition.*** Edited by Tanya Parish and David Roberts. Springer. (1285): 329-341.

10. Pope WH, …**Johnson BK**, …Hatfull GF (2015) Whole genome comparison of a large collection of mycobacteriophages reveals a continuum of phage genetic diversity. ***eLife***, 4:e06416.

11. Leung W, …**Johnson BK**, …Elgin SCR (2015) The Drosophila Muller F elements maintain a distinct set of genomic properties over 40 million years of evolution. ***G3: Genes, Genomes, Genetics***, G3 g3.114.015966.

12. Baker JJ, **Johnson BK**, and Abramovitch RB (2014) Slow growth of *Mycobacterium tuberculosis* at acidic pH is regulated by *phoPR* and host-associated carbon sources. ***Molecular Microbiology***, 94 (1): 56-59.
   -- Highlighted as an Editor's Choice in ***Science Translational Medicine*** (July 9, 2014)

Software and Computational Proficiency

Proficient programming languages: Python, R, and bash
Programming environments: Unix/Linux, Windows, and high performance/cluster computing (PBS and SGE)
Working knowledge languages: C++

1. SPARTA: Simple Program for Automated reference-based bacterial RNA-seq Transcriptome Analysis (www.github.com/biobenkj; sparta.readthedocs.org [documentation and tutorial]; sparta-teaching.readthedocs.org [teaching materials])

2. HAARP: High-throughput screening Automated Analysis and Retrieval of Putative hits (www.github.com/biobenkj/HAARP)

Bioinformatics Experience

Genomics (short and long read/single molecule sequencing)

1. *De novo* and reference-guided genome assembly and annotation
2. Variant calling – whole genome, exome, and targeted sequencing
3. Whole genome and reduced representation/targeted bisulfite sequencing
4. ChIP-seq and regulatory element prediction/identification/annotation
5. SNP and methylation array analysis

Transcriptomics (gene level and transcript/isoform level)

1. RNA-seq (total RNA and coding region-selected analysis)
2. Transcriptome assembly and annotation

Enrichment analyses

1. Integration of ChIP/regulatory element sequencing and expression profiling
2. Transcription factor enrichment
3. Pathway and reactome enrichment
4. Weighted gene correlation network analysis (co-expression and network analysis)

Genome annotation

1. Davis,A.J., … **Johnson,B.K.**, Wertz,J.T., DeJong,R.J. … and Hatfull,G.F. Full Genome Annotation of Mycobacteriophage *Anaya*. NCBI Genbank: JF704106.1, 2011. J. Virol. 86 (4), 2382-2384 (2012)

2. Osterbaan,L.J., … **Johnson,B.K.**, DeJong,R.J., Wertz,J.T., … and Hatfull,G.F. Full Genome Annotation of Mycobacteriophage *Oosterbaan*. NCBI Genbank: JF704109, 2011. J. Virol. 86 (4), 2382-2384 (2012)

3. Jacobs-Sera,D., … **Johnson,B.K.**, … and Hatfull,G.F. Full Genome Annotation of Mycobacteriophage *Red Rock.* NCBI Genbank: NC_025444.1, 2009.

Poster Presentations

1. **Johnson B.K.**, Colvin C.J., Needle D.B., Mba Medie F., Champion P.A.D., and Abramovitch R.B. The Carbonic Anhydrase Inhibitor Ethoxzolamide Inhibits the *Mycobacterium tuberculosis* PhoPR-regulon and Esx-1 Secretion and Attenuates Virulence. Microbial Pathogenesis & Host Response (Cold Spring Harbor Laboratory), Cold Spring Harbor, New York, 2015 – Abstract accepted and conference in September 2015

2. **Johnson B.K.**, Colvin C.J., Needle D.B., Mba Medie F., Champion P.A.D., and Abramovitch R.B. The Carbonic Anhydrase Inhibitor Ethoxzolamide Inhibits the *Mycobacterium tuberculosis* PhoPR-regulon and Esx-1 Secretion and Attenuates Virulence. Midwest Microbial Pathogenesis Conference (MMPC 2015), Indianapolis, Indiana, 2015 – Abstract accepted and conference in September 2015

3. **Johnson, B.K.**, Colvin, C.J., Abramovitch, R.B. Ethoxzolamide inhibits the *Mycobacterium tuberculosis phoPR* regulon and attenuates virulence. Midwest Microbial Pathogenesis Conference (MMPC 2014), Chicago, Illinois, 2014.

4. **Johnson, B.K.**, Colvin, C.J., Abramovitch, R.B. High throughput screen for small molecule inhibitors of a pH-regulated fluorescent biosensor in *Mycobacterium tuberculosis*. Keystone Symposia – Tuberculosis: Understanding the enemy. Whistler, British Colombia, Canada, 2012.

Department, College and University Service

2015-2016	Graduate Student Invited Speaker Organization Committee, Michigan State University
2014-2016	Graduate Representative to the Dean's Advisory Committee, College of Natural Science, Michigan State University
2011-2013	Graduate Student Workshop Organization Committee, Michigan State University

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Selected Media

2017	How to deduplicated PCR (2017) ***Nature Methods*** doi:10.1038/nmeth.4268 --Quotes and comments on computational deduplication methods and UMI use

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Teaching experience

2017	Instructor for introductory command line workshop, Van Andel Research Institute, Grand Rapids, MI - March 30 2017 (vari-linux-workshop.readthedocs.io)
2015	Instructor for microbial genomics and transcriptomics workshop, University of California Davis, Davis, CA – September 24-25 2015
2015	Instructor for Data Carpentry workshop, Genentech, San Francisco, CA – September 21-22 2015
2015	Guest lecturer for senior level undergraduate genomics course discussing RNA-seq data analysis, Michigan State University, East Lansing, MI (mmg434.readthedocs.org)
2015	Guest lecturer for Bioinformatics training workshop, Institute for Cyber Enabled Research, Michigan State University, East Lansing, MI
2014	Guest lecturer for graduate level next generation sequencing course discussing *de novo* bacterial genome assembly, Michigan State University, East Lansing, MI
2014	Teaching assistant for Data Carpentry workshop (www.datacarpentry.org), Michigan State University, East Lansing, MI
2014	Certified Software Carpentry Instructor (www.software-carpentry.org)
2013	Graduate teaching assistant for introductory microbiology, Michigan State University, East Lansing, MI
2009-2011	Undergraduate teaching assistant for Science Education Alliance (SEA) HHMI *Mycobacteriophage* Research Laboratory, Calvin College, Grand Rapids, MI
2010	Teaching Assistant selected to train faculty involved in the Science Education Alliance (SEA) HHMI Mycobacteriophage Research Laboratory, HHMI Janelia Farms Research Campus
2010	Undergraduate teaching assistant for cell biology, Calvin College, Grand Rapids, MI
2009-2010	Undergraduate teaching assistant for medical microbiology, Calvin College, Grand Rapids, MI