Aaron A. Best, Ph.D.
Harrison C. and Mary L. Visscher Professor of Genetics
Department of Biology, Hope College
35 East 12th Street, Holland, MI49423
(616) 395-7376, best@hope.edu, @aaron_best

Education

Post-doctoral. Microbial Evolution. Department of Microbiology, University of Illinois at Urbana-Champaign.
Advisor: Carl R. Woese, Ph.D. 2002-2004

Doctor of Philosophy. Microbiology. Department of Microbiology, University of Illinois at Urbana-Champaign.
Thesis: Evolution of transcription in Archaea and the early-diverging eukaryote, *Giardia lamblia*
Advisor: Gary J. Olsen, Ph.D. 1996-2001

Masters of Science. Microbiology. Department of Microbiology, University of Illinois at Urbana-Champaign.
Advisor: Gary J. Olsen, Ph.D. 1996-1999

Bachelor of Arts. Biology. Department of Biology, William Jewell College, Liberty, MO.
Thesis: Assessing phylogenetic relationships among red algae using 18S ribosomal DNA
Thesis Advisor: Paul W. Gabrielson, Ph.D. 1992-1996

Academic Appointments

Harrison C. and Mary L. Visscher Professor of Genetics.
Department of Biology, Hope College, Holland, MI. 2015-*present*
Harrison C. and Mary L. Visscher Associate Professor of Genetics.
Department of Biology, Hope College, Holland, MI. 2012-2015
Guest Research Faculty. Argonne National Laboratory, Argonne, IL. 2011
Visiting Research Scientist. The Sanford Burnham Medical Research Institute, La Jolla, CA. 2010-2011
Associate Professor of Biology. Department of Biology, Hope College, Holland, MI. 2010-2015
Visiting Research Scientist. The Burnham Institute for Biomedical Research, La Jolla, CA. 2008
Guest Research Faculty. Argonne National Laboratory, Argonne, IL. 2007
Assistant Professor of Biology. Department of Biology, Hope College, Holland, MI. 2004-2010

Honors and Awards

Macatawa Area Coordinating Council "Stakeholder of the Year" Award	2017
Inaugural Holder of the Harrison C. and Mary L. Visscher Endowed Professorship in Genetics, Hope College	2012-2022
Visiting Research Scientist, The Sanford Burnham Medical Research Institute, La Jolla, CA	2010-2011
Argonne National Laboratory Guest Faculty Research Program	2011
Visiting Research Scientist, The Burnham Institute for Biomedical Research, La Jolla, CA	2008
Argonne National Laboratory Guest Faculty Research Program	2007
Towsley Research Scholar, Hope College	2007-2010
Project Kaleidoscope (PKAL) F21 Program	2006
Outstanding Teaching in Microbiology, University of Illinois	1998-1999
University of Illinois List of Teachers Ranked as Excellent (6 semesters)	1996-1999
Full scholarship to attend Workshop on Molecular Evolution, Marine Biological Laboratory, Woods Hole MA	1999
Outstanding Senior Biology Major, William Jewell College	1996
Cambridge Honors Scholar	1994-1995
Council on Undergraduate Research Summer Opportunities for Research CURSOR Fellowship Award	1994
Presidential Scholarship, William Jewell College	1992-1996
Dean's List, William Jewell College	1992, 1995
Alpha Lambda Delta Honors Society	1992

Research Interests

Microbial genomics – comparative genomics, genome-scale metabolic modeling, transcriptional regulatory network modeling, identification of missing gene function, genome sequencing, and microbial ecology of different ecosystems

Microbial evolution – evolution of metabolic and transcriptional networks in microbes, comparative analyses of transcription systems in eukaryotes, mechanisms of transcription in *Giardia lamblia*

Approach at a Primarily Undergraduate Institution

Convergence – My research interests are best-approached using techniques ranging from targeted biochemical and molecular studies to modeling and interpretation of large-scale data sets being produced in the biological sciences today. The techniques and questions sit at the interface among multiple disciplines. Thus, my work is largely collaborative to bring multi-disciplinary perspectives and skills to the studies at hand. Working in the context of a primarily undergraduate institution in a Biology department provides rich opportunities for investigation of problems on multiple scales of biology and allows for fruitful collaboration with large research institutions.

Integration of Research into Courses – Course-based Research Experiences (CREs) are beneficial to both the research program and to the students. CREs often produce useful preliminary data and provide recruiting opportunities for students trained in the project area. CREs allow more students to learn science by actually doing science than I am able to mentor directly in my laboratory. Many of the major areas of my research interests have been implemented as CREs in courses that I teach.

Research Support – *Extramural* *(bolded dates indicate ongoing)*
*(Average level of annualized external support since 2012 is **$790,791**; current annualized level of external support is **$1,631,751**)*

National Science Foundation, Award Number MCB-1716285
"Collaborative Research: RUI: Investigating microbial metabolic and regulatory diversity by modeling gene activity states inferred from transcriptome data" $488,522 — **Sep 2017 – Aug 2020**
PI: Best A and DeJongh M

National Science Foundation, Award Number MCB-1616737
"RUI: Dynamics of Genomic Mosaicism in Non-Host Associated *Escherichia* Populations" $775,316 — **Aug 2016 – Jul 2019**
PI: Best A

Sawyer Products
"Global Survey of Microbial Populations and Chemical Contaminants in Water Sources**"** $314,000 — **Jul 2016 – Dec 2017**
PI: Best A, Peterson J, Pikaart M and Peaslee G

Arnold and Mable Beckman Foundation
"Beckman Scholars Program" $104,000 — **May 2015 – May 2018**
Co-PI: Johnson J and Best A

Herbert H. and Grace A. Dow Foundation
"Meeting the Persistent Challenges: Recruiting, Retaining, and Graduating Michigan STEM Students" $3,000,000 — **Dec 2014 – Nov 2017**
Co-PI: Mader C, Peaslee G and Best A

National Science Foundation, Award Number MCB-1330734
"Collaborative Research: RUI: Developing Integrated Metabolic Regulatory Models (iMRMs) for the Investigation of Metabolic and Regulatory Diversity of Sequenced Microbes" $399,511 — Oct 2013 – Sep 2017
PI: Best A and DeJongh M

Outdoor Discovery Center Macatawa Greenway
"Physiological and Genomic Characteristics of *Escherichia coli* Isolates from the Macatwa Watershed" $12,000 — Sep 2013 –

PI: Best A and Peaslee G — Aug 2014

Great Lakes College Association, *New Directions Initiative*
"Microbial Interactions in Dormant Seeds: Training a Collaborative Team to Integrate the Microbiome with Plant Population Ecology" $10,000 — Aug 2012 –
Co-PI: Murray KG, Best A, Brown K and Bultman TL — Aug 2013

American Society for Microbiology, *Undergraduate Research Fellowship Program*
"Genome-wide analysis of transcription factor binding in *Giardia lamblia*" $1,000 (Accepted Travel Award Portion of Funding; Declined Project Funding) — Jun 2013 –
Mentor/PI: Valesano A (undergraduate) and Best A — May 2014

National Science Foundation, Award Number DBI-1229585
"MRI: Acquisition of a Benchtop Next Generation Sequencing Platform to Enhance Undergraduate Research and Education at Hope College" $171,877 — Sep 2012 –
PI: Best A and Li J — Aug 2015

Department of Energy, Subcontract Number 2F-30041
"KBase: An Integrated Knowledgebase for Predictive Biology and Environmental Research" $380,000 — Oct 2011 –
PI: Best A, DeJongh M and Tintle N — Sep 2016

National Science Foundation, Award Number ABI-0850546
"Extending the RAST Server to Support Reconstruction and Modeling of Cellular Networks" $1,267,183 — Sep 2009 –
Co-PI: DeJongh M, Best A, Tintle N, Rodionov D and Overbeek R — Aug 2012

National Science Foundation, Award Number MCB-0745100
"RUI: Automated Metabolic Reconstruction for All Sequenced Microbial Genomes" $235,022 — Aug 2008 –
Co-PI: DeJongh M and Best A — Jul 2012

Howard Hughes Medical Institute, National Genomics Research Initiative
"Phage Genomics Research Course" ~$36,000 (equipment and supplies) — Jan 2008 –
Co-Director: Best A and Stukey J — May 2011

National Science Foundation, Award Number DBI-0821832
"MRI: Acquisition of Automated Genetic Analyzer for Interdisciplinary Research, Teaching and Training in Molecular Phylogenetics, Biology and Bioinformatics in an Undergraduate College" $117,080 — Sep 2008 –

Co-PI: Best A, Evans T and McDonough V — Aug 2009

American Society for Microbiology, *Undergraduate Research Fellowship Program*
"Validation of Missing Gene Functions in the Rhamnose Metabolic Pathway of *Bacillus, Streptomyces* and *Salmonella*" $3,000 — Jun 2007
Mentor/PI: Stanton K (undergraduate) and Best A — May 2008

Research Support – *Intramural* *(bolded dates indicate ongoing)*

Hope College Howard Hughes Medical Institute, *2014 Course-based Research (CRE) Development Award*
Course Title "Programming Foundations with Application Modules" $20,000 — May 2015 –
Co-PI: McFall R, Bandstra B, Best A and Krueger B — May 2017

Hope College Howard Hughes Medical Institute, *2014 Course-based Research (CRE) Development Award*
Course Title "BIOL 301: General Microbiology Laboratory" $10,000 — May 2014 –
PI: Best A — Dec 2015

Hope College Howard Hughes Medical Institute, *2010 Hughes Research Scholar Award*
"Screening of Natural Plant Extracts for Anti-Parasitic Activity" $5,900 — Jun 2010 –
Mentor/PI: Jansen E (undergraduate) and Best A — Aug 2010

Hope College Howard Hughes Medical Institute, *Faculty Development Grant for Collaborative Research*
"Screening of Natural Seed Extracts from Tropical and Domestic Plants for Anti-parasitic Activity" $12,500 — Jun 2009 –
Co-PI: Best A, Desta D and Murray KG — Jun 2010

Hope College, *Towsely Research Scholar Award*
"A Systems Biology Approach to Unravel the Complexities of Microbial Life" $16,000 + Sabbatical — Jun 2007 –
PI: Best A — Aug 2010

Hope College Howard Hughes Medical Institute, *Interdisciplinary Full Course Development Award*
"Phage Genomics Research" $10,000 — May 2008 –
Co-PI: Best A and Stukey J — Jun 2009

Hope College Howard Hughes Medical Institute, *Faculty Development Grant for Interdisciplinary Research*
"Nucleosome Dynamics in *Giardia lamblia*: A Preliminary Search for Histone Modifications in a Primitive Eukaryote" $10,000 — Jun 2008 –

Co-PI: Best A and Pikaart M — Dec 2008

Hope College Howard Hughes Medical Institute,
Interdisciplinary Course Development Award
"Methods in Modeling Complex Systems" $5,000 — Jan 2007 –
Co-PI: Best A and Krueger B — May 2007

Hope College Howard Hughes Medical Institute,
Faculty Development Grant for Interdisciplinary Research
"Evaluation and Implementation of Structural Equation Modeling as a Statistical Method for Refining Theoretical Genome-Scale Models with Experimental Data" $10,000 — Jun 2006 –
Co-PI: Best A, DeJongh M and Tintle N — Dec 2006

Hope College Howard Hughes Medical Institute,
Interdisciplinary Case Study Development Award
"What's in the Cup?" $2,500 — Mar 2006 –
Co-PI: Best A and Barton A. — Aug 2006

Hope College, *Summer Faculty Development Grant*
$2,500 — Jun 2006 –
Best A — Aug2006

Hope College Howard Hughes Medical Institute,
Faculty Development Grant for Interdisciplinary Research
"Development of a Software Environment for Comparative Genome Analysis and Annotation" $10,000 — Jun 2005 –
Co-PI: Best A and DeJongh M — Dec 2005

Hope College, *Summer Faculty Development Grant*
$2,500 — Jun 2005 –
Best A — Aug2005

Publications

15 peer reviewed publications since 2012, including 10 with over 100 undergraduate co-authors. Names of undergraduate co-authors are indicated by an asterisk.

Google Scholar: http://scholar.google.com/citations?hl=en&user=vX6KclIAAAAJ
ISI Web of Science: 5245 citations since 2013; 6933 citations total; h-index = 16

Research Papers

1. Arkin AP, Stevens RL, Cottingham RW, Maslov S, Henry CS, et al. (2017) The DOE Systems Biology Knowledgebase (KBase). *Nature Biotech. In Press.*
2. Hanauer DI, Graham MJ, SEA-PHAGES, Betancur L, Bobrownicki A, Cresawn SG, Garlena RA, Jacobs-Sera D, Kaufmann N, Pope WH, Russell DA, Jacobs WR, Sivanathan V, Asai DJ, Hatfull GF. (2017) An Inclusive Research-Education

Community (iREC): Impact of the SEA-PHAGES program on research outcomes and student learning. *Proc. Natl. Acad. Sci.* 114:13531-13536. http://www.pnas.org/content/114/51/13531.full

3. Bowerman N*, Tintle N, DeJongh M and **Best AA**. (2017) Identification and Analysis of Bacterial Genomic Metabolic Signatures. Biocomputing 2017. World Scientific. pp. 3-14. http://dx.doi.org/10.1142/9789813207813_0002
4. **Best AA**, Porter AL*, Fraley SM and Fraley GS. (2017) Characterization of Gut Microbiome Dynamics in Developing Pekin Ducks and Impact of Management System. *Front. Microbiol.* 7:2125. http://journal.frontiersin.org/article/10.3389/fmicb.2016.02125/full
5. Faria JP, Davis JJ, Edirisinghe JN, Taylor RC, Weisenhorn P, Olson RD, Stevens RL, Rocha M, Rocha I, **Best AA**, DeJongh M, Tintle NL, Parrello B, Overbeek R and Henry CS. (2016) Computing and Applying Atomic Regulons to Understand Gene Expression and Regulation. *Front. Microbiol.* 7:1819. https://www.frontiersin.org/articles/10.3389/fmicb.2016.01819/full
6. Disselkoen C, Greco B*, Cook K*, Koch K*, Lerebours R*, Viss C*, Cape J*, Held E*, Ashenafi Y*, Fischer K*, Acosta A*, Cunningham M*, **Best AA**, DeJongh M and Tintle N. (2016) A Bayesian Framework for the Classification of Microbial Gene Activity States. *Front. Microbiol.* 7:1191. http://journal.frontiersin.org/Article/10.3389/fmicb.2016.01191/abstract
7. Schenk, A*, Porter, AL*, Alenciks, E*, Frazier, K*, **Best, AA**, Fraley, S. M., et al. (2016). Increased water contamination and grow-out Pekin duck mortality when raised with water troughs compared to pin-metered water lines using a United States management system. *Poult. Sci.* 95(4):736-748. http://ps.oxfordjournals.org/content/95/4/736.full
8. Powers S*, DeJongh M, **Best AA** and Tintle NL. (2015) Cautions about the reliability of pairwise gene correlations based on expression data. *Front. Microbiol.* 6:650 http://dx.doi.org/10.3389/fmicb.2015.00650
9. Pope WH, Bowman CA, Russell DA, Jacobs-Sera D, Asai DJ, Cresawn SG, Jacobs WR, Hendrix RW, Lawrence JG, Hatfull GF, Science Education Alliance Phage Hunters Advancing Genomics and Evolutionary Science*, Phage Hunters Integrating Research and Education, and Mycobacterial Genetics Course. (2015) Whole genome comparison of a large collection of mycobacteriophages reveals a continuum of phage genetic diversity. *eLife*. 4:e06416. *Includes 42 Hope College Undergraduate Student Authors. http://dx.doi.org/10.7554/eLife.06416
10. Rodionova IA, Li X, Thiel V, Stolyar S, Stanton K*, Fredrickson JF, Bryant DA, Osterman AL, **Best AA** and Rodionov DA. (2013) Comparative genomics and functional analysis of rhamnose catabolic pathways and regulons in Bacteria. *Front. Microbiol.* 4:407. (corresponding author) http://www.frontiersin.org/Journal/10.3389/fmicb.2013.00407/full
11. Pope WH, Jacobs-Sera D, **Best AA**, Broussard GW, Connerly PL, Dedrick RM, Kremer TA, Offner S, Ogiefo AH, Pizzorno MC, Rockenbach K, Russell DA, Stowe EL, Stukey J, Thibault SA, Conway JF, Hendrix RW and Hatfull GF. (2013) Cluster J Mycobacteriophages: Intron Splicing in Capsid and Tail Genes. *PLoS ONE.* 8(7):e69273

http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0069273
12. Ravcheev DA, **Best AA**, Sernova NV, Kazanov MD, Novichkov PS, Rodionov DA. (2013) Genomic reconstruction of transcriptional regulatory networks in lactic acid bacteria. *BMC Genomics.* 14:94. http://www.biomedcentral.com/1471-2164/14/94
13. Tintle NL, Sitarik A*, Boerema B*, Young K*, **Best AA** and DeJongh M. (2012) Evaluating the quality of gene sets used in the analysis of bacterial gene expression data. *BMC Bioinform.* 13:469. http://www.biomedcentral.com/1471-2105/13/193
14. Rodionova IA, Yang C, Li X, Kurnasov OV, **Best AA,** Osterman AL, Rodionov DA. (2012) Diversity and Versatility of the *Thermotoga maritima* Sugar Kinome. *J. Bacteriol.* 194:5552-5563. http://jb.asm.org/content/194/20/5552
15. Ravcheev DA, **Best AA**, Tintle N, DeJongh M, Osterman AL, Novichkov PS and Rodionov DA. (2011) Inference of the Transcriptional Regulatory Network in *Staphylococcus aureus* by Integration of Experimental and Genomics-Based Evidence. *J. Bacteriol.* 193:3228-3240. http://jb.asm.org/cgi/content/full/193/13/3228
16. Pope WH, Jacobs-Sera D, Russell DA, Peebles CL, Al-Atrache Z, et al*. (2011) Expanding the Diversity of Mycobacteriophages: Insights into Genome Architecture and Evolution. *PLoS ONE* 6(1): e16329. doi:10.1371/journal.pone.0016329. *Includes 18 Undergraduate Student Authors http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0016329
17. Desta D, Sjoholm R*, Lee L, Lee M, Dittenhager K, Canche S*, Babu B, Chavda S, Dewar C, Yanow S, **Best AA** and Lee M. (2011) Synthesis and Antiprotozoal Activity of 1,2,3,4-Tetrahydro-2-thioxopyrimidine Analogs of Combretestatin A-4.*Med. Chem. Res.* 20:364-369. http://www.springerlink.com/content/53r936311433600v/
18. Henry CS, DeJongh M, **Best AA**, Frybarger P*, Linsay B* and Stevens RL. (2010) High-throughput generation, optimization and analysis of genome-scale metabolic models.*Nature Biotech.* 28:977-982. http://www.nature.com/nbt/journal/v28/n9/full/nbt.1672.html
19. Tintle NL, **Best AA**, DeJongh M, VanBruggen D*, Heffron F, Porwollik S and Taylor RC. (2008) Gene set analyses for interpretation of microarray experiments on prokaryotic organisms. *BMC Bioinform.* 9:469. http://www.biomedcentral.com/1471-2105/9/469
20. Aziz RK, Bartels D, **Best AA**, DeJongh M, Disz T, Edwards RA, Formsma K*, Gerdes S, Glass EM, Kubal M, Meyer F, Olsen GJ, Olson R, Osterman AL, Overbeek RA, McNeil LK, Paarmann D, Paczian T, Parrello B, Pusch GD, Reich C, Stevens R, Vassieva O, Vonstein V, Wilke A and Zagnitko O. (2008) The RAST Server: Rapid Annotations using Subsystems Technology. *BMC Genomics.* 9:75. http://www.biomedcentral.com/1471-2164/9/75
21. DeJongh M, Formsma K*, Boillot P*, Gould J*, Rycenga M* and **Best A**. (2007) Toward the automated generation of genome-scale metabolic models in the SEED. *BMC Bioinform.* 8:139. http://www.biomedcentral.com/1471-2105/8/139/
22. Morrison HG, McArthur AG, Gillin FD, Aley SB, Adam RD, Olsen GJ, **Best AA**, Cande WZ, Chen F, Cipriano MJ, Davids BJ, Dawson SC, Elmendorf HG, Hehl AB, Holder ME, Huse SM, Kim UU, Lasek-Nesselquist E, Manning G, Nigam A, Nixon JEJ, Palm D,

Passamaneck NE, Prabhu A, Reich CI, Reiner DS, Samuelson J, Svard SG and Sogin ML. (2007) Genomic minimalism in the early diverging, intestinal parasite, *Giardia lamblia*. *Science.* 317:1921-1926. http://www.sciencemag.org/cgi/content/abstract/317/5846/1921

23. **Best AA**, Morrison HG, McArthur AG, Sogin ML and Olsen GJ. (2004) Evolution of transcription: insights from the genome of *Giardia lamblia*. *Genome Res.* 14:1537-1547. http://www.genome.org/cgi/content/full/14/8/1537
24. **Best AA** and Olsen GJ. (2001) Similar subunit architecture of archaeal and eukaryal RNA polymerases. *FEMS Microbiol Lett.* 195:85-90. http://www.blackwell-synergy.com/doi/full/10.1111/j.1574-6968.2001.tb10502.x

Book Contributions, Reviews, Commentaries and Genome Announcements

1. Anders K, Barekzi N, **Best AA**, Frederick G, Mavrodi D, et al*. (2017) Genome Sequences of Mycobacteriophages Amgine, Amohnition, Bella96, Cain, DarthP, Hammy, Krueger, LastHope, Peanam, PhelpsODU, Phrank, SirPhilip, Slimphazie and Unicorn. *Genome Announc.* 5:e01202-17. *Includes 31 Undergraduate Student Authors http://genomea.asm.org/content/5/49/e01202-17.full
2. Kazmierczak RA, **Best AA**, Nguyen D*, Eisenstark A. (2017) Whole-Genome Shotgun Sequences of *Salmonella enterica* Serovar Typhimurium Lilleengen Type Strains LT1, LT18, LT19, LT20, LT21, and LT22. *Genome Announc.* 5:e00720-17. https://doi.org/10.1128/genomeA.00720-17
3. Devoid S, Overbeek R, DeJongh M, Vonstein V, **Best AA**, Henry C. (2013) Automated Genome Annotation and Metabolic Model Reconstruction in the SEED and Model SEED. in Alper H.S. *et al.* (eds) Systems Metabolic Engineering: Methods and Protocols, *Methods Mol. Biol.* 985:17-45. http://link.springer.com/protocol/10.1007/978-1-62703-299-5_2
4. **Best AA** and Harbour DV. (2012) Virtual Laboratory Meets Case-Based Instruction *J. Microbiol. & Biol. Edu.* 13:469.
5. Henry CS, Overbeek RA, Xia F, **Best AA**, Glass E, Gilbert JA, Larsen PE, Edwards R, Disz T, Meyer F, Vonstein V, DeJongh M, Bartels D, Dsai N, D'Souza M, Devoid S, Keegan KP, Olson R, Wilke A, Wilkening J and Stevens RL. (2011) Connecting Genotype to Phenotype in the Era of High-throughput Sequencing. *Biochim. Biophys. Acta*. 1810:967-977. http://www.sciencedirect.com/science/article/pii/S0304416511000596
6. **Best AA**, Dejongh M, Barton AJ, Brown JR and Barney CC. (2007) Models of Interdisciplinary Research and Service Learning at Hope College. *CUR Quarterly.* 28:18-23.

Pre-Prints

1. Disselkoen C, Hekman N*, DeJongh M, Best AA and Tintle N. (2017) Bayesian Gene Activity State Estimation from Genome-Wide Transcriptomics Data. *bioRxiv* 24100 doi: https://doi.org/10.1101/241000
2. Arkin AP, Stevens RL, Cottingham RW, Maslov S, Henry CS, et al. (2016) The DOE Systems Biology Knowledgebase (KBase). *bioRxiv* 096354 doi: https://doi.org/10.1101/096354

Selected Public Datasets Originating from Classroom Based Research Projects

1. Peirce,C.E.*, **Best,A.**, Stukey,J., Barber,A.J.*, Chew,R.D.*, Corajod,J.M.*, Georges,A.E.*, Harmon,C.J.*, Hildebrandt,E.N.*, Jansen,E.C.*, Knutter,J.Z.*, Kraay,B.A.*, LaRoche,J.R.*, Long,C.A.*, Murray,C.E.*, Peterson,L.J.*, Rose,A.C.*, Schipper,D.J.*, Simmons,J.M.*, Sjoholm,R.L.*, Slette,I.J.*, Willis,A.N.*, Davenport,K., Chertkov,O., Goodwin,L., Green,L., Rogers,Y., Tapia,R., Brettin,T., Detter,C., Han,C., Bradley,K.W., Khaja,R., Lewis,M.F., Barker,L.P., Jordan,T.C., Ko,C., Russell,D.A., Bowman,C.A., Jacobs-Sera,D., Hendrix,R.W. and Hatfull,G.F. (2009) Complete genome sequence of Mycobacteriophage Pumpkin. GenBank: GQ303265.
2. Ludwig,M.L.*, **Best,A.**, Stukey,J., Baxter,C.E.*, Dobbs,H.A.*, Endean,T.B.*, Gasparotto,A.C.*, Genzink,K.A.*, Gerometta,E.A.*, Goodman,D.E.*, Kozack,J.C.*, LaBarge,L.M.*, Lewinski,J.L.*, Wieringa,J.G.*, Willey,M.R.*, Yancey,H.E.*, Zhang,X.*, Meincke,L.J., Goodwin,L.A., Detter,J.C., Han,S., Green,L.D., Bradley,K.W., Khaja,R., Lewis,M.F., Barker,L.P., Jordan,T.C., Russell,D.A., Leuba,K.D., Fritz,M.J., Bowman,C.A., Pope,W.H., Jacobs-Sera,D., Hendrix,R.W. and Hatfull,G.F. (2011) Complete genome sequence of Mycobacteriophage Vix. GenBank: JF704114.
3. Karssen,M.P.*, **Best,A.**, Stukey,J., D'Addario,T.J.*, Day,A.S.*, Deeg,C.E.*, Johnson,L.E.*, Leonard,B.R.*, Neilands,D.A.*, Owens,N.D.*, Schuman,J.A.*, Stukel,M.G.*, Tans,L.M.*, Thomas,M.K.*, Ulmer,M.R.*, VanWynen,C.M.*, Vessells,D.W.*, Viveen,V.D.*, Weiss,M.P*., Anders,K.R., Braun,M.A., Delesalle,V.A., Hughes,L.E., Ware,V.C., Bradley,K.W., Barker,L.P., Asai,D.J., Bowman,C.A., Russell,D.A., Pope,W.H., Jacobs-Sera,D., Hendrix,R.W. and Hatfull,G.F. (2014) Complete genome sequence of Mycobacteriophage Inventum. GenBank: KM066034.

Selected Presentations

National Conferences with Undergraduate Students (students indicated by asterisk)

1. Pritchard S*, Hughes, M*, Payne C*, Ragon L* and Best AA. Genomic and Physiological Characteristics of Novel *Escherichia* Strains Isolated from Fresh Water Sources. American Society for Microbiology Microbe. New Orleans, LA, June 2017.
2. Hughes M*, Ragon L*, Lee K*, Pikaart M, Peaslee GF and Best AA. Genomic Characterization of *Escherichia* Isolates from a Watershed. American Society for Microbiology Microbe. Boston, MA, June 2016.
3. Cushman K* and Fischman H*. Lysis Cassette Mosaicism and Potential Expanded Host Range Evident in the Genomes of Glass and Bella96. 7th Annual SEA-PHAGES Symposium HHMI Janelia Research Campus, Washington, D.C., June 2015.
4. Valesano AL* and Best AA. Transcriptome Profiling of the Life Cycle of *Giardia lamblia* using RNA-Seq. 14th Annual Beckman Symposium, Irvine, CA, August 2014.
5. Valesano AL* and Best AA. Transcriptome Profiling of the Life Cycle of *Giardia lamblia* using RNA-Seq. American Society for Microbiology 114th General Meeting, Boston, MA, May 2014.
6. Deeg CE*, Schulz W*, Eguiluz M*, Stukey J and Best AA. Refining Restriction Enzyme Digestion Strategies to Identify Cluster Membership of Newly Isolated Mycobacteriophages. American Society for Microbiology 114th General Meeting, Boston, MA, May 2014.

7. Deeg C*. Refining Restriction Enzyme Digestion Strategies to Identify Cluster Membership of Newly Isolated Mycobacteriophages. 5th Annual SEA-PHAGES Symposium HHMI Janelia Farm, Washington, D.C., June 2013.
8. Deeg C*. Isolation of 20 Mycobacteriophages and Genomic Analysis of the Novel Mycobacteriophage, Inventum. 5th Annual SEA-PHAGES Symposium, HHMI Janelia Farm, Washington, D.C., June 2013.
9. McLellan LK*, Woodiga SA, King SJ, Rodionov D and Best AA. Regulation of Hyaluronic Acid Metabolism in *Streptococcus pneumonia*e by RegR. American Society for Microbiology 113th General Meeting, Denver, CO, May 2013.
10. Valesano AL*, Eguiluz M* and Best AA. Comparative Analysis of 26 Genome Scale Metabolic Models of the Genus *Shewanella*. American Society for Microbiology 113th General Meeting, Denver, CO, May 2013.
11. McLellan LK*. Isolation of 20 Mycobacteriophages and Genomic Analysis of Phineas, a Member of the Newly Formed Cluster P. 4th Annual SEA-PHAGES Symposium, HHMI Janelia Farm, Washington, D.C., June 2012.
12. Kozack J*, Phage Genomics Research Group*(13 1st Year Students), Stukey J and Best AA. Isolation and Genome Sequencing of Two Novel Mycobacteriophage, Ender and Vix. Poster. American Society for Microbiology 110th General Meeting, San Diego, CA, May 2010. *(originating from classroom laboratory)*
13. Dobbs H*. Isolation and Genome Sequencing of Two Novel Mycobacteriophage, Ender and Vix. Oral Presentation. 2nd Annual National Genomics Research Initiative Symposium. HHMI Janelia Farm Research Campus, Ashburn, VA, June 2010.
14. Georges A*. Isolation and Genomce Sequencing of a Novel Mycobacteriophage, Pumpkin. Oral Presentation. 1st Annual National Genomics Research Initiative Symposium. HHMI Janelia Farm Research Campus, Ashburn, VA, June 2009.
15. -Jansen EC*, Peirce C*, Phage Genomics Research Group*(18 1st Year Students), Stukey J and Best AA. Isolation and Genome Sequencing of a Novel Mycobacteriophage, Pumpkin. Poster. American Society for Microbiology 109th General Meeting, Philadelphia, PA, May 2009. *(originating from classroom laboratory)*
16. Henry C, Best AA, DeJongh M, Frybarger P* and Stevens R. High-throughput Reconstruction and Optimization of 100 New Genome-scale Metabolic Models. Poster. American Society for Microbiology 109th General Meeting, Philadelphia, PA, May 2009.
17. Bowerman N*, McPherson N*, DeJongh M and BestAA. Automated Assignment of Metabolic Capabilities for Sequenced Microbes Based on Genome Annotation. Poster. American Society for Microbiology 109th General Meeting, Philadelphia, PA, May 2009.
18. Frybarger P*, Henry C, DeJongh M, Stevens R and Best AA. Reconstruction, Optimization and Curation of 100 New Genome-scale Metabolic Models.Poster. RECOMB-Bioinformatics Education, University of California San Diego, La Jolla, CA, March 2009.
19. Stanton KM* and Best AA. Validation of missing gene functions in the rhamnose metabolic pathway of *Bacillus*, *Salmonella* and *Streptomyces*. American Society for Microbiology 108th General Meeting. Boston, MA, June 2008.
20. Best AA, DeJongh M, Boillot P*, Bowerman N*, Formsma K*, Frybarger P* and Wilkening J*. Toward the Automated Generation of Genome-scale Metabolic

Networks in the SEED. Poster. American Society for Microbiology 107th General Meeting, Toronto ON, May 2007. *(Note: I was the presenter at this meeting)*

21. Sarria I*, Holtrop MF*, Bush ZJ*, Lapham LL* and Best AA. Unique Transcription
22. Mechanism of *Giardia lamblia*. Poster. American Society for Microbiology 106th General Meeting, Orlando FL, May 2006.
23. Sarria I*, Holtrop M* and Best A. Unique Transcription Mechanism of *Giardia lamblia*. Oral Presentation. Annual Biomedical Research Conference for Minority Students, Atlanta GA, November 2005.

Local and Regional Conferences with Undergraduate Students

(For these presentations, a "-" at the beginning of the reference indicates a project conducted solely in a classroom laboratory at the time of the presentation)

1. Pritchard S*, Ragon L*, Hughes M*, Miller C*, Acosta A*, Morgan C*, Mullen B*, Rosema D*, Smith G*, Speet J*, Thomas R*, Whitmore N* and Winter N*. Genomic Characteristics of *Escherichia coli* Isolates from the Macatawa Watershed. 14th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2015.
2. –Dalman M*, Fischman H*, Fletcher E*, Franz K*, Guillaume J*, Hardy E*, Jeavons A*, Jurik C*, Krahn A*, Machay A*, Mejicano-Gormely E*, Petrovich M*, Platte C*, Rich A*, Royer J*, Theis MC*, Vela N* and Deeg C*. Isolation of 35 Mycobacteriophages and Genomic Analysis of the Novel Mycobacteriophage, Glass. 14th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2015.
3. –Belyk K*, Conroy J*, Cushman K*, Elliott M*, Fifer J*, Gitter S*, Gutting A*, Kain E*, Kosiba D*, Lee S*, Nguyen K*, Parliament N*, Reitsma H*, Sievers M*, Talaga S*, Versluis P*, Yoon YC*, Zick R* and Bogolin M*. Isolation of 35 Mycobacteriophages and Genomic Analysis of the Novel Mycobacteriophage, Bella96. 14th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2015.
4. -Alexander C*, DeGlopper K*, Dorn S*, Ensink E*, Gager C*, Henry R*, Masiak A*, May R*, Moffat S*, Schaar C*, Sellers L* and Trentadue K*. Isolation of 32 Mycobacteriophages and Genomic Analysis of the Novel Mycobacteriophage, Roscoe. 13th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2014.
5. -Banaszak E*, Bogolin B*, Bordeaux J*, Bottomley M*, Bulthuis K*, Collins J*, Cunningham M*, Harris S*, Hodgson K*, Klochko-Bull J*, Knol J*, Lunderberg D*, Merriman B*, Nurenberg E*, Otteman C*, Rhodes A*, Stamas H* and Teal L*. Isolation of 32 Mycobacteriophages and Genomic Analysis of the Novel Mycobacteriophage, Minnie. 13th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2014.
6. Atwell M*, Blystra D*, Miller C*, Morrow A*, Pritchard S* and Sheasley L*. Physiological and Genomic Characteristics of *Escherichia coli* Isolates from the Macatawa Watershed. 13th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2014.

7. Valesano AL*. Genome-wide analysis of transcription factor binding in *Giardia lamblia*. West Michigan Regional Undergraduate Science Research Conference, Van Andel Research Institute, Grand Rapids, MI, November 2013.
8. Miller C*. Characterization of New Microbial Populations in the Macatawa Watershed. PEW Undergraduate Research Symposium in the Biological Sciences and Psychology. St. Louis, MO, November 2013.
9. Valesano AL*. Genome-wide analysis of transcription factor binding in *Giardia lamblia*. PEW Undergraduate Research Symposium in the Biological Sciences and Psychology, St. Louis, MO, November 2013.
10. McLellan LK*. Regulation of Hyaluronic Acid Metabolism in *Streptococcus pneumoniae* by RegR. 12th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2013.
11. Eguiluz MB* and Valesano AL*. Comparative Analysis of 26 Genome Scale Metabolic Models of the Genus *Shewanella*. 12th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2013.
12. -D'Addario TJ*, Day A*, Deeg C*, et al.(17 first year students*). Isolation of 20 Mycobacteriophages and Genomic Analysis of the Novel Mycobacteriophage, Inventum. 12th Annual Hope College Celebration for Undergraduate Research and Creative Performance, April 2013.
13. Shades K*. Determination of Putative DNA Binding Sites for Virulence Factor RegR in *Streptococcus*. 11th Annual Hope College Celebration for Undergraduate Research and Creative Performance, Holland, MI, April 2012.
14. -Eguiluz MB*, Gage MR*, Hederstedt ER*, et al.(17 first year students*). Isolation of 20 Mycobacteriophages and Genomic Analysis of the Novel Mycobacteriophage, Phineas. 11th Annual Hope College Celebration for Undergraduate Research and Creative Performance, Holland, MI, April 2012.
15. Eguiluz MB*. Taming of the Shew – Metabolic Modeling of the Genus *Shewanella* PEW Undergraduate Research Symposium in the Biological Sciences and Psychology, Chicago, IL, November, 2012.
16. McLellan LK*. Regulation of Hyaluronic Acid Metabolism in *Streptococcus pneumoniae* by RegR. West Michigan Regional Undergraduate Science Research Conference, Van Andel Research Institute, Grand Rapids, MI, November 2012.
17. Valesano AL*. Metabolic Modeling of the Genus *Shewanella* Using the ModelSEED. West Michigan Regional Undergraduate Science Research Conference Van Andel Research Institute, Grand Rapids, MI, November 2012.
18. Jansen E* and Best AA*. Screening Extracts from the Tropical Pioneer Plants *Bocconia frutescens*, *Guettarda poasana*, and *Phytolacca rivinoides* for Anti-Parasitic Activity. 10th Annual Hope College Celebration for Undergraduate Research and Creative Performance, Holland, MI, April 2011.
19. Peirce C* and Best AA*. Generation and Comparative Analyses of Genome-scale Metabolic Models for the Genus Shewanella using the Model SEED. 10th Annual Hope College Celebration for Undergraduate Research and Creative Performance, Holland, MI, April 2011.
20. Hicks CA* and Best AA*. Suspected Function of the Archaeal Cluster of the GHMP Kinase Superfamily as Characterized by *Methanococcus maripaludis* and *Salinibacter*

ruber. Poster. 9th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2010.

21. Edewaard K* and Best AA*. Identifying Transcription Factor Binding Sites in *Giardia lamblia*. Poster. 9th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2010.
22. -Nickols A*, VanderVeen G*, Boyd K* and Lewis S*. Predicted Regulons of PdhR and PsrA in *Shewanella oneidensis*. Poster.9th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2010.
23. -Tapper II DF*, Eastburg LC*, Agauas SJ*, Morrical EB* and Peirce C*. Predicted Transcription Factor Binding Sites of FadR Regulon in *S. oneidensis* Unsubstantiated in EMSA. Poster. 9th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2010.
24. -Becker JP*, Bowerman NC*, Constant JR*, Kosiba SL* and Peirce C*. Verifying the Predicted Transcription Factor, PsrA, and Its Predicted Binding Sites in *Shewanella oneidensis.* Poster. 9th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2010.
25. -DeYoung JT*, Shier SE*, Slenk NC*, Colburn T* and Peirce C*. Effect of Proline in the Expression of the Predicted HypR Regulon in *Shewanella oneidensis.* Poster. 9th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2010.
26. -Baxter C*, Dobbs H*, Endean T*, Gasparotto A*, Genzink K*, Gerometta E*, Goodman D*, Kozack J*, LaBarge L*, Lewinski J*, Ludwig M*, Wieringa J*, Willey M* and Yancey H*. Isolation and Genome Sequencing of Two Novel Mycobacteriophages, Ender and Vix. Poster. 9th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2010.
27. Donkersloot J*, Guerra Jr. L*, Lamphear B*, Pikaart M and Best AA. Ubiquitylation of Histone H2B in *Giardia lamblia*.University of Notre Dame, South Bend, IN, July 2009.
28. -Barrus J*, DeHaan C*, Lewis J*, Westcott A* and Best AA. Investigation of the Correlation Between Gene Clustering and Biochemical Activity of PduX in *Streptomyces coelicolor* and *Listeria innocua*. Poster. 8th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2009.
29. Bowerman N*, McPherson N* and Best AA. Automated Assignment of Metabolic Capabilities for Sequenced Microbes Based on Genome Annotation. Poster. 8th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2009.
30. Frybarger P*, DeJongh M and Best AA. High-throughput Reconstruction and Optimization of 100 New Genome-scale Metabolic Models. Poster. 8th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2009.
31. -Hicks C*, Lewis B*, Phillips T*, VanderMaas M* and Best AA. Predicted Role of Pantothenate Kinase 4 in Coenzyme A Biosynthesis from *M. maripaludis* and *S. ruber*. Poster.8th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2009.
32. -Madden J*, Parrott S*, Poel N*, Salas T* and Best AA. Identifying Substrate Binding Specificity of a GHMP Kinase in *Thermoplasma acidophilum*. Poster. 8th Annual Hope

College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2009.

33. -Peirce C*, Barber A*, Chew R*, Corajod J*, Georges A*, Harmon C*, Hildebrandt E*, Jansen E*, Knutter J*, Kraay B*, LaRoche J*, Long C*, Murray C*, Peterson L*, Rose A*, Schipper D*, Simmons J*, Sjoholm R*, Slette I*, Willis A*, Stukey J and Best AA.Isolation and Genome Sequencing of a Nove Mycobacteriophage, Pumpkin. Poster. 8th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, April 2009.
34. Lamphear BR*, Bowerman NC* and Best AA. Identifying Transcription Factor Binding Sites in *Giardia lamblia*. Poster. 7th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, March 2008.
35. Stanton KM* and Best AA. Validation of Missing Gene Functions in the Rhamnose Metabolic Pathway. Poster. 7th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, March 2008.
36. Bowerman NC* and Best AA. Automated Generation and Manual Curation of a Metabolic Model for *Shewanella oneidensis* MR-1. Poster. 7th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, March 2008.
37. Chavez A* and Best AA. Predicted N-formyl-L-glutamate Deformylase in Histidine Catabolism. Poster. 7th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, March 2008.
38. -Lyons J*, McNeil A*, Serini J*, Treolar N* and Best AA. Predicted L-threonine Kinase for B12 Biosynthesis. Poster. 7th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, March 2008.
39. -Barberio K*, Lee K-H*, Pepper A*, Slaughter J* and Best AA. Predicted Role of DapE in the Arginine Metabolic Pathway. Poster. 7th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, March 2008.
40. -Gardner D*, Kou J*, Meidema T*, Morgan E* and Best AA. Genetic Analysis of a Predicted Dual Role of DapE in the Arginine and Lysine Biosynthesis Pathways. Poster. 7th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, March 2008.
41. -Ellsworth K*, Goltz A*, Jansma A*, McConnelly E* and Best AA. Missing Gene, N-formylglutamate Deformylase (*nfoD*) in the Histidine Degradation Pathway. Poster. 7th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, March 2008.
42. Bowerman NC*, Lamphear BR*, and Best AA. Identifying Transcription Factor Binding Sites in *Giardia lamblia*. Poster. PEW Undergraduate Research Symposium, St. Louis, MO, November 2007.
43. Bowerman NC*, Lamphear BR*, and Best AA. Identifying Transcription Factor Binding Sites in *Giardia lamblia*. Poster. West Michigan Undergraduate Science Research Conference, Van Andel Institute, Grand Rapids, MI, October 2007.
44. -Heerema S*, Hess K*, Janczak K*, Vickery J* and Best AA. Examination of a Predicted L-threonine Kinase Required for Coenzyme B-12 Biosynthesis in *Streptomyces coelicolor* and *Salmonella typhimurium*. Poster. 6th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, January 2007.

45. -Green M*, Harrier S*, Haumiller W*, Nichols A* and Best AA. Determination of *rhaZ* Function in L-rhamnose Utilization in *Salmonella typhimurium*. Poster. 6th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, January 2007.
46. -Lien M*, Oosterhouse E*, Stanton K*, Gendron M* and Best AA. Predicted Roles of RhaE and RhaW Domains in Fused YuxG in the Rhamnose Metabolic Pathway. Poster. 6th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, January 2007.
47. -Cooper A*, DeHaan J*, Engers W*, Voyles A* and Best AA. Predicted Alternative N-formylglutamate Deformylase in Histidine Catabolism. Poster. 6th Annual Hope College Celebration of Undergraduate Research and Creative Performance, Holland, MI, January 2007.
48. VanBeek M*, Hekman J*, Krasity B* and Best A. Identifying Transcription Factor Binding Sites in *Giardia lamblia*. Poster. PEW Undergraduate Research Symposium, Chicago, IL, November 2006.
49. Holtrop M*, Sarria I* and Best A. The Unique Mechanism of Transcription in *Giardia lamblia*. Poster. 5th Annual Celebration of Undergraduate Research and Creative Performance, Holland MI, January 2006.
50. Gonthier SJ* and Best AA. A Software Environment for the Analysis of Protein Sequence Motifs. Poster.5th Annual Celebration of Undergraduate Research and Creative Performance, Holland MI, January 2006.
51. Ambrose JR*, Formsma KS*, Gould JA*, Best AA and DeJongh M. Integration of KEGG Pathways into the SEED. Oral Presentation. 16th Annual Argonne Symposium for Undergraduates in Science, Engineering and Mathematics, Argonne IL, November 2005.

National Conference Abstracts without Undergraduate Students

1. DeJongh M, Best A, Tintle N and Henry C. Integration of Transcriptomic Data and Metabolic Models for Expression-Informed Flux-Balance Analysis. COBRA 2015, 4th Conference on Constraint-Based Reconstruction and Analysis. Heidelberg, Germany, September 2015.
2. Marshall C, O'Brien S, Kemner K, O'Loughlin E, Best A and Gilbert J. Microbial Ecology of Restored Wetlands at Various Stages of Maturity and Flooding Frequency. American Society for Microbiology 115th General Meeting, New Orleans, LA, June 2015.
3. Henry C, Dehal P, Baumol J, Best A, Bischof J, et al. Metabolic Modeling in the DOE Systems Biology Knowledgebase. COBRA 2014 3rd Conference on Constraint-Based Reconstruction and Analysis. Charlottesville, VA, May 2014.
4. Henry C, DeJongh M, Best A and Stevens R. High-throughput Reconstruction and Optimization of 130 New Genome-Scale Metabolic Models. 2009 AIChE Annual Meeting, Nashville, TN, November 2009.
5. Best AA and Stukey J. Hope College Phage Genomics Research Course: First Year Implementation and Results. Poster. 1st Annual National Genomics Research Initiative Symposium. HHMI Janelia Farm Research Campus, Ashburn, VA, June 2009.

6. Best AA, DeJongh M and Krueger B. Integrating Bioinformatics and Computational Modeling into the Biology Curriculum at Hope College. Poster. RECOMB-Bioinformatics Education, University of California San Diego, La Jolla, CA, March 2009.
7. DeJongh M and Best AA. Toward the Automatic Generation of Genome-scale Metabolic Models in the SEED. Poster. DOE Joint Genomics: GTL Awardee Workshop V, Bethesda, MD, 2007.
8. Best AA and DeJongh M.A Research-based Approach to Teaching Bioinformatics: Microbial Genome Annotation and Metabolic Modeling using the SEED. Poster. American Society for Microbiology Conference for Undergraduate Educators (ASMCUE), Orlando FL, May 2006.
9. Best AA and Woese CR. Defining microbial relationships with complete genomes: the euryarchaeal crown. Poster. American Society for Microbiology 104th General Meeting, New Orleans LA, May 2004.
10. Best AA and Olsen GJ. Evolution of transcription: insights from the genome of *Giardia lamblia*. Poster. American Society for Microbiology 102nd General Meeting, Salt Lake City UT, May 2002.
11. Best AA and Olsen GJ. A genome-wide search for archaeal promoter elements. Poster. Ninth DOE Genome Contractor and Grantee Workshop, Oakland CA, January, 2002.
12. Best AA and Olsen GJ. Bioinformatics for genome analysis. Poster. Ninth DOE Genome Contractor and Grantee Workshop, Oakland CA, January, 2002.
13. Best AA and Olsen GJ. Gene transfer: past and present. Poster. Ninth DOE Genome Contractor and Grantee Workshop, Oakland CA, January, 2002.
14. Best AA and Olsen GJ. Polyadenylation of mRNA transcripts in Archaea. Cell and Molecular Biology Training Grant Symposium, University of Illinois, October 2001.
15. Best AA and Olsen GJ.Subunit interactions of an archaeal RNA polymerase and relationships to eucarya. Poster. American Society for Microbiology 99th General Meeting, Chicago IL, May 1999

Invited Oral Presentations

1. *Macatawa Watershed Escherichia coli Levels and Population Genomics.* Invited Talk. Ottawa County Water Quality Forum, West Olive, MI, November 2017. Best A.
2. *Longitudinal Monitoring of Bacterial Populations and Nutrient Loads in the Macatawa Watershed.* Invited Seminar. Department of Biology, Dordt College, Sioux Center, IA, November 2017. Best A.
3. *Longitudinal Monitoring of Microbial Populations and Nutrient Loads in the Macatawa Watershed.* Invited Talk. IAGLR 2017, Detroit, MI, May 2017. Best A.
4. *Identification and Analysis of Bacterial Genomic Metabolic Signatures.* Invited Paper Presentation. Pacific Symposium on Biocomputing 2017, The Big Island, HI, January 2017. Best A.
5. *Integrating Teaching and Research at Primarily Undergraduate Institutions: Challenging, Achievable, Rewarding*. Invited Seminar. Department of Microbiology and Immunology Seminar Series, University of Michigan, Ann Arbor, MI, November 2016. Best A.

6. *The Dynamics and Interpretation of Microbiome Data*. Invited Seminar. Poultry Science Association. New Orleans, LA, July 2016. Best A.
7. *SEAze the Phage: Evolution of First Year STEM Education at Hope College.* Invited Plenary Lecture at the Michigan American Society for Microbiology Spring Meeting 2016: Frontiers in Microbiology Education. Grand Rapids, MI, April 2016. Stukey J and Best A.
8. *Funding and Facilitating Your Research.* Invited Workshop Speaker and Discussion Leader for the "Getting started as a microbiologist at a primarily undergraduate institution (PUI)" Workshop at the American Society for Microbiology 114th General Meeting, Boston, MA, May 2014. Best AA and King R.
9. *Integrating Science and Education Panel Discussion.* Invited Panel Participant at the 2013 HHMI SEA-PHAGES *In Silico* Workshop, HHMI Headquarters, Chevy Chase, MD, December 2013. Best AA.
10. *The Metabolic Landscape of Sequenced Microbes.* Fall 2013 Department of Biochemistry Seminar Series, University of Missouri, Columbia, MO, October 2013. Best AA.
11. *Incorporating Your Research Into Your Teaching.* Invited Panel Participant at the Second Biennial Midwest P_3 Workshop: Postdoc to PUI Professor, Hope College, Holland, MI, April 2013. Best AA.
12. *The Metabolic Landscape of Sequenced Microbes.* Keynote Speaker for the 2012 Microbiology Research Conference, University of Illinois at Urbana-Champaign, October 2012. Best AA.
13. *Metabolic Reconstruction and Modeling of Sequenced Microbes in the Context of Undergraduate Education.* American Society for Microbiology Symposium "Functional Genomics in the Classroom" at the American Society for Microbiology 110th General Meeting, San Diego, CA, May 2010. Best AA.
14. *Patching Holes in Metabolic Networks: Identification and Validation of Novel Enzymes in Rhamnose Catabolism*. Spring 2010 Department of Biochemistry Seminar Series, Wayne State University, Detroit, MI, March 2010. Best AA.
15. *Interdisciplinary Research Across Biology, Mathematics and Computer Science: Genome-scale Metabolic Reconstruction and Modeling of Microbial Life.* Midstates Consortium for Mathematics and Science: Interdisciplinary Science Education, St. Olaf College, Northfield, MN, January 2007. Best AA, DeJongh M and Tintle N.
16. *Combining Automated Genome-scale Metabolic Model Generation with Prediction and Validation of Gene Function in the Context of Undergraduate Education.* DOE Joint Genomics: GTL Awardee Workshop V, Bethesda, MD, February 2007. Best AA.
17. *Genome-scale Metabolic Reconstruction and Modeling of Microbial Life*. HHMI Interdisciplinary Lecture, Hope College Summer Research Program, June 2007. Best AA, DeJongh M and Tintle N.
18. *Forming Links with Disciplinary Societies.* Project Kaleidoscope (PKAL) F21 Meeting, Chicago IL, 2006. Best AA.
19. *Bioinformatics at Hope College.* Albion College, Department of Biology, March 2005. Best AA and DeJongh M.
20. *Evolution of transcription in Archaea and the early-diverging eukaryote,* Giardia lamblia. University of Illinois Department of Microbiology, November 2001. Best AA.

21. *Similar subunit architecture of archaeal and eukaryal RNA polymerases*. University of Illinois Department of Microbiology, October 2000. Best AA.
22. *Assessing phylogenetic relationships among red algae using 18S ribosomal DNA.* Missouri Academy of Sciences, Springfield, MO, April 1996. Best AA.

Media, Public Presentations and Outreach

1. *Hope College Day1 Research Communities*. Recruiting and Promotional Video. Aided in design/production, released December 2017. https://youtu.be/j5Vk96JH4Pk
2. *Hope College Day1 Research Communities – Watershed.* Recruiting and Promotional Video. Interviewed for and aided in design/production, released November 2017. https://youtu.be/na31bzrJpSk
3. *Hands-On Learning from Day1 and Beyond.* Interviewed for "News from Hope College" magazine, released spring 2017. https://magazine.hope.edu/spring-2017/day1/
4. *Major Grant Supports Comprehensive Study of E. coli in Macatawa Watershed.* Interviewed for Hope College News, released September 2016. http://www.hope.edu/news/2016/research/major-nsf-grant-supports-comprehensive-study-of-e-coli-in-macatawa-watershed.html
5. *Student Research and Development from Day1.* Interviewed for Hope College "Stories of Hope" Blog, released April 2016. https://blogs.hope.edu/stories-of-hope/natural-and-applied-sciences/student-research-and-development-from-day-1/
6. *A bright future… Maria Eguiluz.* Interviewed for Hope College promotional video highlighting student success, released January 2015. http://www.hope.edu/bright-future
7. *Through the Sequencing Revolution: Revealing the Unseen Self.* Department Sponsored Session as part of Hope College 2014 Critical Issues Symposium – "Technology and the Future of Being Human", Hope College, Holland, MI, September 2014. *Invited Seminar*. Best AA.
8. *Hope College: Collaborative Student Research and Leading Edge Technology*. Indianapolis Hope College Alumni Association, Indianapolis, IN, May 2014. Best AA.
9. *Macatawa Watershed Water Quality Study*. Ottawa County Eighth Annual Water Quality Forum, West Olive, MI, November 2013. *Invited Seminar.* Best AA, Pikaart M and Peaslee G.
10. *NSF Funds Integrated Metabolic and Regulatory Modeling Grant.* Interviewed for Hope Today News, released October 2013. http://www.hope.edu/2013/10/22/nsf-funds-integrated-metabolic-and-regulatory-modeling-grant
11. *Biology in the 21st Century.* Harrison C. and Mary L. Visscher Endowed Chair in Genetics Investiture Ceremony, Hope College, September 2012. *Investiture Lecture*. Best AA.
12. *"Next-Generation" Genomic Sequencer Will Enhance Program*. Interviewed for Hope Today News, released August 2012. http://www.hope.edu/2012/08/16/next-generation-genomic-sequencer-will-enhance-program

13. *Aaron Best Appointed to New Visscher Professorship in Genetics*. Interviewed for Hope Today News, released August 2012. http://www.hope.edu/2012/08/01/aaron-best-appointed-new-visscher-professorship-genetics
14. *New Software Speeds Genome Analysis*. Interviewed for Hope Today News, released October 2012. http://www.hope.edu/2010/10/05/new-software-speeds-genome-analysis
15. *Research Out of the Gate*. Interviewed for Campus Profile article in "News from Hope College" magazine, April 2010. Article describing Phage Genomics Research Initiative at Hope College.
16. *Microbial Hitchhikers and the Human Genome: How Much of You is You?* Hope College 2009 Alumni Weekend Alumni College Lecture, May 2009. *Invited Seminar*. Best AA.
17. *Forty Under 40*. Feature interview for the Holland Sentinel community overview "Focus 2008" publication, March, 2008
18. Interviewed for Fox 17 News "On Campus" segment describing the HHMI Science Education Alliance National Genomics Research Initiative, Phage Genomics Research course at Hope College, aired January, 10, 2008
19. *Hope Chosen for National HHMI Science Initiative*. Interviewed for Hope Today News, released December 2007. http://www.hope.edu/2007/12/12/hope-chosen-national-hhmi-science-initiative
20. *Aaron Best Contributes to Article in "Science"*. Interviewed for Hope Today News, released November 2007. http://www.hope.edu/2007/11/28/aaron-best-contributes-article-science

Professional Service

Editorial

1. Guest Associate Editor for *Nature Frontiers In Microbiology*, hosting the Research Topic, *"Towards Integrated Metabolic and Regulatory Models of All Microbial Life."* Topic proposal approved by *Frontiers In* Editor; Acting as lead editor for the topic, 2014 – Present. http://journal.frontiersin.org/researchtopic/3129/towards-integrated-metabolic-and-regulatory-models-of-all-microbial-life
2. Editorial Board Member (Microbiology Section) for the Nature Publishing Group international open access journal, *Scientific Reports*, 2011 – Present.

Peer Review

1. External reviewer for PUI department of biology
2. *Ad hoc* reviewer for confidential tenure and promotion packages
3. *Ad hoc* reviewer for *3-Biotech*, *Archaea*, *Bioinformatics, BMC Biotechnology for Biofuels, BMC Microbiology, F1000 Research, FEMS Microbiology Ecology, Frontiers in Microbiology, Journal of Great Lakes Research, Nucleic Acids Research, PLoS One, PLoS Pathogens, Proceedings of the National Academies of Sciences, Scientific World Journal*
4. *Ad hoc* reviewer for grant proposals for the National Science Foundation
5. *Ad hoc* reviewer for the Alfred P. Sloan Foundation Microbiology of the Built Environment Program
6. *Ad hoc* reviewer for the M.J. Murdock Charitable Trust College Research Program for Life Sciences

7. *Reviewer* for the Howard Hughes Medical Institute initiative, "The Science Education Alliance" proposal

Conference Organization and Workshop Participation

1. *Co-Organizer.* "Your Students + Your Goals + Your Ideas = Your CURE" Concurrent Education Session at the American Society for Microbiology Conference for Undergraduate Educators (ASMCUE), July 2018, Austin, TX.
2. *Participant*. "2014 CUREnet Conference on Course-Based Undergraduate Research Experiences" at Cold Spring Harbor Laboratory. March 31 – April 2, 2014. Cold Spring Harbor, NY.
3. *Invited Speaker and Discussion Leader*. "Getting started as a microbiologist at a primarily undergraduate institution (PUI)" Workshop at the American Society for Microbiology 114th General Meeting, Boston, MA, May 17, 2014.
4. *Invited Panel Participant*. 2013 HHMI SEA-PHAGES *In Silico* Workshop, HHMI Headquarters, Chevy Chase, MD, December 11-13, 2013.
5. *Invited Participant* (of ~30 attendees). Institute for Computing in Science (ICiS): "Genomics Driving Modeling in Biology". July 23-30, 2011. Park City, UT.
6. *Invited Participant* (of 19 attendees representing PUIs, R1 Universities and Research Institutes). Howard Hughes Medical Institute Extended Workshop: "Genomics: Opportunities, Tools and Challenges". November 2007. Chevy Chase, MD.
7. *Co-Chairperson* of the committee to organize the 14th Annual American Society of Microbiology Conference for Undergraduate Educators (ASMCUE), May 2007, Buffalo, NY.

Service at Hope College

Department of Biology, Hope College

BIOL 195 Laboratory Coordinator (2004 and 2005)
Advising of Biology Majors/Minors (2005-present)
Biology Website Administration (2005 – present)
BIOL 240 Curriculum Revision Committee (2005)
Prospective Student Visitation Meetings (2005 – present)
DeKruif Award Committee (2006, 2007, 2009)
Biology Seminar Series Co-coordinator (2006-2007)
Biology Recruitment and Retention Task Force (2007)
Biology Website Revision Committee, Chair (2007, 2008)
Biology Website Committee, Chair (2008-present)
BIOL 231 Microbiology for the Allied Health Professions Laboratory Coordinator (2009, 2010, 2012, 2013)
Systems Biology Tenure Track Position Search Committee (2012-2013)
Introductory Laboratory Curriculum Revision – Genetics Subcommittee (2012-2013)
Introductory Laboratory Curriculum Revision – Evolution Subcommittee (2012-2013)
Chairperson, BIOL 108 Introductory Laboratory Curriculum Revision – Genetics Module, Chairperson (2013-2014)

Chairperson, Biology Tenure Track Position Search Committee (2013-2014)
Biology Seminar Series Coordinator (2014-2015)
Biology Department Scheduling Coordinator (2015-2017)

Division of Natural and Applied Sciences, Hope College

Computational Science Minor Advisory Committee (2005)
Computational Science and Modeling Advisory Committee (2006-2012)
Scholarship Advisory Committee – Goldwater, Udall, NSF Fellowships (2008)
Coordination of Inaugural Visscher Lecture in Genetics – Dr. Thomas Cech, speaker (2013)
Coordination of Visscher Lecture in Genetics – Dr. Graham Hatfull (2015); Dr. Jennifer Doudna (2017)
Beckman Scholar Research Mentor (2013-2014)
Co-investigator on invited proposal to the Herbert H. and Grace A. Dow Foundation, "Meeting the Persistent Challenges: Recruiting, Retaining, and Graduating Michigan STEM Students", awarded (2014)
Co-writer of invited proposal to the Arnold and Mabel Beckman Foundation Beckman Scholar Program, awarded (2014)

Hope College

Cultural Affairs Committee (2006-2007)
Critical Issues Symposium Planning Committee
2008, "Global Health: From Catastrophe to Cure"
2009, "At Water's Edge: Complacency, Thirst, Action"
2012, "Reconciliation: Hope in a Divided World"
Advisory Committee on Financial Resources (2009-2010)
Committee on Admissions and Financial Aid, Chairperson (2011-present)
Pre-College Conference Planning Committee (2012)
Hope College Web Advisory Group (2014-)
Strategic Planning Study Group on "Enrollment and Student Profile" member (2014)

Academic and Professional Affiliations

Member of the American Society for Microbiology (1998 – present)
Division R – Evolutionary and Genomic Microbiology
Division W – Microbiology Education
Member of the PKAL F21 Program
Member of the Council on Undergraduate Research (2009 – present)

Undergraduate Mentoring and Teaching

Mentored Undergraduate Researchers

76 undergraduate students have been mentored in my laboratory since beginning independent career at Hope College in 2004

37 former students are currently in graduate programs or have advanced degrees in STEM fields
10 former students are working in STEM fields

>350 students included in Research Projects through Course-based Research Experiences (non-overlapping with above)

Courses, Laboratories and Modules Developed and Implemented at Hope College

Professor. BIOL/CHEM 195 *Day1: Watershed Introductory Laboratory*
Professor. IDS 100 *Day1: Watershed First Year Seminar*
Hope College, 2015-2016, 2016-2017 Both Semesters

Designed and implemented a course with Dr. Graham Peaslee (Hope College Chemistry Department) for first year students with an interest in science. The course combines the First Year Seminar transition to college course at Hope College with an investigative year-long CRE laboratory. The course serves as an alternate introductory biology and chemistry lab credit. The research is focused on the chemical/physical characteristics of water and their relationship to microbial populations as determined by 16S rRNA next generation sequencing data in the local Macatawa watershed. The research question is coupled to a community led remediation effort on the watershed.

Professor. CSCI 195/BIOL 195 *Introduction to Python Programming/Introduction to Bioinformatics*
Hope College, 2017 Spring Semesters

Designed and implemented a course with colleagues from Computer Science, Chemistry, Religion, History and Communication departments to introduce students to programming. Students take a computer science course for 7 weeks to learn the basics of programming in python, followed by a disciplinary application module in the discipline of their choosing. In the Introduction to Bioinformatics module, students learn the basics of bioinformatics through programming exercises and research projects.

Professor. BIOL 301 *General Microbiology*
Hope College, 2004-2009, 2011-2015 Fall Semesters

Designed and implemented a general microbiology course and associated laboratory for undergraduate biology majors. Course-based Research Experiences (CREs) have been incorporated into the laboratory module over the past 10 years, including: bioinformatics-driven hypothesis testing of gene function, watershed microbial source tracking, watershed microbe genome sequencing and physiological characterization of isolates. The laboratory is currently being converted to a fully investigative approach centered on the microbial populations in the local watershed.

Professor. BIOL 231 *Microbiology for the Allied Health Professions*
Hope College, 2005-2007, 2009, 2010, 2012, 2013 Spring Semesters

Designed and implemented a general microbiology course and associated laboratory for undergraduate nursing majors and non-biology majors. Designed and implemented investigative laboratory modules and an interdisciplinary case study in collaboration with the Hope College Nursing Department. During 2012 and 2013, taught in laboratory portion of the course only.

Professor. BIOL 395 *Topics in Bioinformatics*
Hope College, 2005-2006, Fall and Spring Semesters; 2006, 2007, 2009, 2012, 2014 Fall Semesters

Designed and conducted a research-based course in microbial genome annotation and metabolic modeling. Co-taught with Dr. Matthew DeJongh, Hope College Computer Science Department 2005-2006. Designed as a project based course incorporating programming, algorithm design, and research questions.

Professor. BIOL 207 and 208 *Honors Lab in Cells and Genetics – Phage Genomics Research*
Hope College, 2008-2014 Full Academic Years (primary in Spring semesters)

In collaboration with Dr. Joseph Stukey, implemented a year-long honors course in phage biology for first-year students at Hope College. The course exposes students to authentic research through isolation, molecular characterization, genome sequencing and bioinformatics analysis of phages. The course was initially funded through the HHMI National Genomics Research Initiative. Currently funded by Hope College with contributions from HHMI and the University of Pittsburgh. Primary responsibility for spring semester covering bioinformatics/genomics.

Module Development. BIOL 108 *General Biology Laboratory II – Genetics Module*
Hope College, 2014, Spring Semester

Chairperson of the Genetics Module group to develop an investigative, multi-week module exploring principles of heredity and molecular genetics. This module uses molecular techniques to characterize canine trait determining loci, exposing students to DNA isolation, DNA sequencing, sequence analysis, and genetic databases. Coordinated initial implementation of module in 2014.

Professor. CHEM 395-01 *Methods in Modeling Complex Systems*
Hope College, 2007, Spring Semester

Designed and implemented a course in collaboration with Dr. Brent Krueger, Hope College Chemistry Department, exploring the application of computational modeling to scientific problems.

Other Courses Taught

Professor. BIOL 195 *Introduction to Cell Biology*
Hope College, 2004 and 2005, Fall Semesters

Professor. BIOL 240 *Cells and Genetics Laboratory*
Hope College, 2008, Fall Semester
Guest Lecturer. BIOCH 355 *Techniques in Biochemistry and Biotechnology*
University of Illinois, 2003, Fall Semester
Teaching Assistant. Molecular Phylogeny Workshop
Centers for Disease Control, Atlanta, GA, September 2001
Teaching Assistant. MCBIO 101 *Introductory Microbiology Laboratory*
University of Illinois, 1996-1999, 6 semesters
Guest Lecturer. MCBIO 100 *Introductory Microbiology Lecture*
University of Illinois, 1997-1998, Summer Session II
Advisor. Senior Thesis Research and Graduate Rotation Projects
University of Illinois, 1997-2001
Teaching Assistant. Molecular Biology Laboratory Tutorial
Oxbridge Honors Program, William Jewell College, Spring 1996
Teaching Assistant. Bio133 *Evolution and Ecology*
William Jewell College, Fall 1993, 1996