William Gerald Alexander, PhD

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EMPLOYMENT

2021-present Assistant R&D Staff Scientist
Biosciences Division
Oak Ridge National Laboratory, Oak Ridge, TN

2018-2021 Assistant Professor
Department of Biology
Truman State University, Kirksville, MO

2018 Postdoctoral Research Associate
Department of Chemical & Biological Engineering
University of Colorado-Boulder, Boulder, CO

2016-2018 Senior Scientist
Inscripta, Inc.
Boulder, CO

2011-2016 Postdoctoral Research Associate
Laboratory of Genetics/DOE Great Lakes Bioenergy Research Center
University of Wisconsin-Madison, Madison, WI

2008, 2011 Adjunct Instructor
Columbia College
Columbia, MO & Lake Ozark, MO

EDUCATION

2005-2011 Doctor of Philosophy – Biological Sciences
University of Missouri-Columbia, Columbia, MO

2001-2005 Bachelor of Science – Biology
Truman State University, Kirksville, MO

EXTRAMURAL FUNDING

09/22-08/27 DOE Office of Biological and Environmental Research. “Microbial community engineering tools for enhancing polyolefin degradation and valorization.” Role: Co-I, 20% effort. Total: TBD

09/17-08/21 NSF: MCB-1716820. “Combinatorial Engineering of Essentiality.” Role: co-PI, 50% effort. Total: $660,000.

08/09-07/10 Graduate Assistantship in Areas of National Need Fellow. Total: $30,000.

INTRAMURAL FUNDING

07/22-09/23 ORNL Lab Directed Research & Development, Director’s R&D Fund. “Towards mapping sequence-activity relationships of an entire microbial proteome.” Role: co-PI, 20% effort. Total: $700,000.

11/21-09/22 ORNL Lab Directed Research & Development, Standard Seed Money Fund. “Remediation of engineered redox imbalance by radiotrophy.” Role: PI, 10% effort. Total: $50,000.

09/20-01/21 Truman State University Office of Student Research Grant-in-Aid of Scholarship and Research Program. “Optimizing genome editing in *Chlamydomonas reinhardtii* using alternative nucleases.” Role: PI, 10% effort. Total: $750.

PEER-REVIEWED ARTICLES (*,† denote equal contribution; indicates undergraduate research assistants)

1) Peris D, **Alexander WG**, Fisher, KJ, Moriarty RV, Basuino MG, Ubbelohde EJ, Wrobel RL, and Hittinger CT. (2020) Synthetic hybrids of six yeast species. *Nat. Commun.* **11**(1): 2085.

2) Kuang MC, Kominek J, **Alexander WG**, Cheng J-F, Wrobel RL, and Hittinger CT. (2018) Repeated *cis*-regulatory tuning of a metabolic bottleneck gene during evolution. *Mol. Biol. Evol.* **35**(8): 1968-1981.

3) Peris D, Moriarty RV, **Alexander WG**, *et al*. (2017) Hybridization and directed evolution of *Saccharomyces* species for cellulosic biofuel production. *Biotech. Biofuels*. **10**(1): 78-97.

4) Garst A, Bassalo MC, Pines G, Lynch SA, Halweg-Edwards AL, Liu R, Liang L, Wang ZW, Zeitoun R, **Alexander WG**, and Gill RT. (2017) Genome scale sequence-to-activity relationship mapping at single nucleotide resolution. *Nat. Biotech*. **35**(1): 48-55.

5) Wisecaver JH, **Alexander WG**, King SB, Hittinger CT, and Rokas A. (2016) Dynamic evolution of nitric oxide detoxifying flavohemoglobins, a family of single-protein metabolic modules in bacteria and eukaryotes. *Mol. Biol. Evol.* **33**(8): 1979-1987.

6) **Alexander WG**, Wisecaver JH, Rokas A, and Hittinger CT. (2016) Horizontally acquired genes in early-diverging pathogenic fungi enable the use of host nucleosides and nucleotides. *Proc. Natl. Acad. Sci. U. S. A.* **113**(15): 4116-4121.

7) **Alexander WG**, Peris D, Pfannenstiel B, Opulente D, Kuang MC, and Hittinger CT. (2016) Efficient engineering of marker-free synthetic allotetraploids of *Saccharomyces*. *Fungal Genet. Biol*. **89**(1): 10-17 (*Nota Bene*: this was an invited contribution for a special issue on Fungal Synthetic Biology).

8) **Alexander WG**, Doering DT, and Hittinger CT. (2014) High-efficiency genome editing and allele replacement in prototrophic and wild strains of *Saccharomyces*. *Genetics* **198**(3): 859-866.

9) Peris D, Sylvester K, Libkind D, Gonçalves P, Sampaio JP, **Alexander WG**, and Hittinger CT. (2014) Population structure and reticulate evolution of *Saccharomyces eubayanus* and its lager-brewing hybrids. *Mol. Ecol.* **23**(8): 2031-2045.

10) Xiao H†, **Alexander WG**†, Hammond TM†, Boone EC, Perdue TC, Pukkila PJ, and Shiu PKT. (2010) QIP, a protein that converts duplex siRNA into single strands, is required for Meiotic Silencing by Unpaired DNA. *Genetics* **186**(1): 119-126.

11) **Alexander WG***, Raju NB*, Xiao H*, Hammond TM, Perdue TD, Metzenberg RL, Pukkila PJ, and Shiu PKT. (2008) DCL-1 colocalizes with other components of the MSUD machinery and is required for silencing. *Fungal Genet. Biol.* **45**(5): 719-727.

12) Bardiya N, **Alexander WG**, Perdue TD, Barry EG, Metzenberg RL, Pukkila PJ, and Shiu PKT. (2008) Characterization of interactions between and among components of MSUD machinery in *Neurospora crassa* using Bimolecular Fluorescence Complementation. *Genetics* **178**(1): 593-596.

REVIEWS & COMMENTARY

1) **Alexander WG**. (2019) Marionette strains aim to make refining metabolic pathways faster and easier. *Synth. Biol* **4**(1): ysz007.

2) **Alexander WG**. (2018) A history of genome editing in *Saccharomyces cerevisiae*. *Yeast* **35**(5): 355-360. (*Nota Bene*: this was an invited review for the Budding Topics series)

3) Momany M, Di Pietro A, **Alexander WG**, *et al.* (2015) Meeting Report: Fungal Genomics Meets Social Media: Highlights of the 28th Fungal Genetics Conference at Asilomar. *G3* **5**(12): 2523-2525. (*Nota Bene*: this was an invited contribution from Dr. Michelle Momany and *Genes*|*Genomes*|*Genetics*)

PATENTS

1) Hittinger CT and **Alexander WG**. "Constructs and methods for genome editing and genetic engineering of fungi." US Patent No. 10,870,858; issued December 22, 2020.

2) **Alexander WG**, Navarro DP, and Hittinger CT. “Synthetic yeast cells and the methods and uses of the same.” Patent application number US 2018/0127784 A1.

PROFESSIONAL MEMBERSHIP & SERVICE (*indicates an elected position; *ad hoc* committees omitted)

Member:	Society for Industrial Microbiology and Biotechnology, Genetics Society of America
Reviewer:	*Genome Research, Yeast, Fungal Genetics and Biology, Molecular Biology & Evolution, Biotechnology & Bioengineering, Antonie van Leeuwenhoek, Mycologia, BMC Biology*
2022	Co-Chair, High-Throughput Technologies Session, SIMB SFBC
2020-2021	Truman AAUP Chapter Executive Committee Member-At-Large*
2020-2021	High Impact Experiences Committee Member
2019-2021	Biology Departmental Seminar Committee Member & Chair*
2019-2020	Science Olympiad Exam Writer and Proctor, Designer Genes event
2018-2020	Tau Kappa Epsilon International Fraternity Faculty Adviser
2018-2019	STEM Perspective of The Dialogues Committee Committee Member
2014-2015	Representative of Conversion Area for GLBRC Retreat 2015
2011	Laboratory of Genetics Annual Retreat Poster Judge
2005-2011	Mizzou Biology Graduate Student Association Member (Treasurer* ‘07-‘08)

INSTRUCTOR OF RECORD EXPERIENCE

Columbia College

Genetics with lab (Su08)
Principles of Biology I with lab (Su11)

Truman State University

Cells, Molecules, & Genes with lab (Fa18, Fa19)
Genetics with lab (Sp19, Sp20, Fa20, Sp21)
Mycology with lab (Sp20)
Introduction to Writing About Biology (Fa20)
Senior Seminar (Sp21)

HONORS & AWARDS (*designates a competitive award, †designates a student-nominated award)

2021	Instructor of the Year, National Residence Hall Honorary, Bess Truman Chapter*†
2021	COPLAC Dunn Award Nominee*†
2021	Research Mentor of the Year Nominee, Truman Student Government*†
2020	William O’Donnell Lee Advising Award Nominee*†
2020	Educator of the Year Nominee and Finalist, Truman Student Government*†
2020	Instructor of Year Winner, National Residence Hall Honorary, Bess Truman Chapter*†
2013	Cold Spring Harbor Laboratory scholarship to attend the inaugural Synthetic Biology course*
2011	Missouri Graduate Student Association Outstanding Graduate Student Nominee*
2009	David Perkins Fund Award*
2005	Graduated Truman State University *cum laude*
2004	Truman State University President's Recognition Award
2003	NSF Research Experience for Undergraduates Fellow*

MENTORING & MANAGEMENT

Year	Name	Status During Contact	Current Status
2010-2011	Abby Rehard	Undergraduate Laboratory Tech, Shiu Lab	Musician, University of Missouri-Columbia School of Music
2011	Ashlan Musante	Rotating Graduate Student, Hittinger Lab	Associate Director, Alnylam Pharmaceuticals
2011	Meihua “Christina” Kuang	Rotating Graduate Student, Hittinger Lab	Postdoc, University of California-San Diego
2011	Elaine Welch	Rotating Graduate Student, Hittinger Lab	Associate Research Scientist, PPD
2012	EmilyClaire Baker	Rotating Graduate Student, Hittinger Lab	Postdoc, University of Oregon
2012	Mary O’Neill	Rotating Graduate Student, Hittinger Lab	Postdoc, Institut Pasteur
2012	Seth Keel	Rotating Graduate Student, Hittinger Lab	Solutions Architect, Wisconsin Institutes for Discovery
2012	Maria Sardi	Rotating Graduate Student, Hittinger Lab	Senior Bioinformatician, Cargill
2013	Drew Doering	Rotating Graduate Student, Hittinger Lab	Scientist, Joint Genome Institute
2014	Brandon Pfannenstiel	Rotating Graduate Student, Hittinger Lab	Scientist I, Zymergen
2016	Russell Wrobel, PhD	Scientist, Hittinger Lab	Scientist, Hittinger Lab
2016-2018	Clint Davis	Research Associate, Inscripta	Research Associate, Inscripta
2016-2018	Charles Johnson	Research Associate, Inscripta	Scientist I, Inscripta
2017-2018	Brett Dunn	Research Associate, Inscripta	Lab Technician III, Biodesix
2017-2018	Miles Gander, PhD	Scientist I, Inscripta	Scientist II, AbSci
2018-2020	Carolynn Gonzalez	Undergraduate Research Asst, Alexander Lab	Undergraduate Student, St. Louis University
2019-2020	Allison Houghton	Undergraduate Research Asst, Alexander Lab	Graduate Student, IU Bloomington
2019-2020	Mira Basuino	Undergraduate Research Asst, Alexander Lab	Medical Student, Kansas City University
2019-2021	Emily Ubbelohde	Undergraduate Research Asst, Alexander Lab	Graduate Student, UW-Madison
2019-2021	Hannah Kimbrough	Undergraduate Research Asst, Alexander Lab	Laboratory Intern, Stowers Institute
2020-2021	RJ Flinn	Undergraduate Research Asst, Alexander Lab	Slated to graduate Truman Spring 2022

INVITED PRESENTATIONS

2021	Oak Ridge Nation Laboratory, Oak Ridge, TN
2019	A.T. Still University, Kirksville, MO
2019	Truman State University, Kirksville, MO
2018	A.T. Still University, Kirksville, MO
2018	Truman State University, Kirksville, MO
2016	Swansea University, Swansea, Wales, United Kingdom
2016	Muse Biotechnology, Boulder, CO
2016	GLBRC Annual Science Meeting, Lake Geneva, WI
2016	University of Southern Mississippi, Hattiesburg, MS
2016	Clark University, Worcester, MA
2015	Oak Ridge National Laboratory, Oak Ridge, TN
2015	Ginkgo Bioworks, Boston, MA
2015	Washington University in St. Louis, St. Louis, MO
2015	10th Annual DoE JGI User Meeting, Walnut Creek, CA
2015	28th Fungal Genetics at Asilomar, Pacific Grove, CA
2015	Evolution Seminar Series, University of Wisconsin, Madison, WI
2014	7th Annual Midwest Yeast Meeting, Northwestern University, Evanston, IL
2014	GLBRC Annual Retreat, South Bend, IN
2014	Missouri University of Science and Technology, Rolla, MO
2013	GLBRC Annual Retreat, South Bend, IN
2010	Gordon Conference on Cellular and Molecular Fungal Biology, Holderness, NH
2010	Truman State University, Kirksville, MO
2009	25th Fungal Genetics at Asilomar, Pacific Grove, CA