

## Julie A. Bethany Rakes

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### Education:

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- Indiana University Southeast  
B.A. English Literature  
GPA: 3.95  
May 2002
- Indiana University Southeast  
B.S. Biology, Minor: Microbiology  
Undergraduate Research Advisor: Elizabeth Rueschhoff  
GPA: 3.975  
May 2016
- Indiana University Southeast  
A.A. Chemistry  
GPA: 3.975  
May 2016
- Arizona State University  
PhD Environmental Life Sciences  
GPA: 4.0  
In Progress

### Laboratory/Research Experience:

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- **Garcia-Pichel Lab** Oct. 2016-Present
  - **Graduate Lab**
    - **Biologic Soil Crust Restoration**
      - Biological soil crust coring and harvesting
      - DNA extraction
      - Chlorophyll extraction
    - **Bacterial Predation in Biologic Soil Crusts**
      - Filter sterilization
      - Fluorescence microscopy w/ DAPI staining
      - Confocal Microscopy
      - Axenic bacterial culturing and sterile technique
      - Bacterial Isolation
      - TEM
- **Gile Lab** Aug. 2016-Oct. 2016
  - **Graduate Lab Rotation**
    - ***Lophomonas striata* speciation and phylogeny**
      - Field collection of termites and cockroaches
      - Cell picking
      - DNA extraction
      - Cloning of bacterial cells
- **Rueschhoff Lab** May 2015-May 2016

- **Undergraduate Research Assistant**
  - **Investigating and Identifying Novel Protein Interactions in *Arabidopsis thaliana* of the PLP synthase complex**
    - Transformation of yeast plasmids
    - Western Blot
    - Protein extraction from yeast
    - PCR
- **Biology Prep Lab**
  - **General Lab Prep**
    - Production of media plates and tissue culture tubes (NA & LB)
    - Production of buffers of varying types and pH values
    - Proper handling of caustic and volatile chemicals
    - Proper handling of biohazard materials
    - Preparation of agarose gels for electrophoresis
    - Prepare introductory biology laboratory courses

### **Other Laboratory Skills:**

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- Plasmid DNA extraction
- Restriction enzyme digest of DNA
- DNA ligation into plasmid
- DNA primer development
- DNA and RNA isolation
- Replica plating
- Centrifuge/Microcentrifuge
- Southern Blot
- UV gel imaging
- Bacterial transformation
- Biotin labeling and detection
- Gel electrophoresis
- Agarose gel preparation
- Plate and media preparation (LB/NA)
- Nanodrop
- Gram staining, negative staining and spore staining
- Kirby Bauer antibiotic resistance testing
- Plate streaking
- Isolation of bacteria via selective and differential media
- Enterotube categorization of bacteria
- Biochemical testing of Gram negative bacteria including Phenol red lactose broth, SIMs deep, methyl red/ Vogues-Proskauer, citrate slants and lysine decarboxylase tests
- Biochemical testing of Gram positive bacteria including catalase, coagulase and hemolysis tests
- Series dilutions
- Coliscan coliform water testing

- Brightfield microscopy, fluorescence microscopy
- General autoclave use
- Distillation, reflux, recrystallization, purification and other general organic laboratory procedures
- Thin Layer Chromatography
- Gas Chromatography
- Signal interpretation of Infrared Spectroscopy and NMR Spectroscopy
- Feral cat trapping

### Teaching and Mentoring Experience:

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- **T.A., Biological Thinking (Lab)** Fall 2017
  - Taught lab-based techniques and concepts
  - Developed and graded homework and quizzes
- **T.A., Conceptual Approaches to Biology for Majors I (Recitation)** Fall 2016
  - Taught expanded material from lecture-based material in an active learning setting
  - Reviewed tests, assisted students with lecture coursework
- **Supplemental Instructor, Introduction to Biological Sciences 1** Fall 2014
  - Prepared activities, quizzes and supplemental material focusing on entry level biology concepts for freshman and sophomore level undergraduates
  - Assisted students with lecture and lab coursework assignments

### Professional Memberships:

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- American Society for Microbiology (ASM)
- American Chemical Society (ACS)

### Community Service:

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- Arizona Humane Society Foster and Volunteer 2016-Present
- Alley Cat Advocates Volunteer 2015-2016
- Kentucky Humane Society Foster and Volunteer 2009-2010
- Harrison-Crawford State Forestry Volunteer 2006-2007

### Honors and Awards:

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- BYU Charles Redd Center for Western Studies: Summer Award for Upper Division and Graduate Students 2017
- School of Life Sciences Doctoral Recruitment Fellowship 2017/18
- Outstanding Biology student award, Indiana University Southeast 2016
- Graduated with highest distinction, B.S. Biology, Indiana University Southeast 2016
- Pinnacle National Honors Society 2015
- Claude D. Baker Scholarship 2015
- Empowering People MVP Award, Information Technology, Indiana University

- Southeast 2013
- Graduated with highest distinction, B.A. English, Indiana University Southeast 2002
- Outstanding English student award, Indiana University Southeast 2002

### **Professional Experience:**

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#### **Information Technology Coordinator**

*University Information Technology Services, Indiana University Southeast* 04/2011-06/2014

- Develop and manage \$7M+ budget
- Assisted with integration of regional and central IT offices
- Hire and terminate all part-time employees

#### **Media Services Coordinator**

*Information Technology, Indiana University Southeast* 09/2005-04/2011

- Develop and manage \$750,000 budget
- Supervise full-time and part-time employees

### **Professional Training:**

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- Broadening Leadership Series 2008
- Project SAFE Training (Diversity Acceptance Training) 2006

### **Presentation Experience:**

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- Biennial Conference of Science and Management on the Colorado Plateau & Southwest Region Oral Presentation 2017
- Indiana Academy of Sciences Poster Presentation 2016

### **References:**

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**Ferran Garcia-Pichel Ph.D., Dean of Natural Sciences, College of Liberal Arts and Sciences, Professor, School of Life Sciences**

Arizona State University  
(480) 965-8065, ferran@asu.edu

**Elizabeth Rueschhoff Ph.D., Assistant Professor of Biology**

Indiana University Southeast  
(812) 941-2027, erueschh@ius.edu

**David Treves Ph.D., Associate Professor of Biology**

Indiana University Southeast  
(812) 941-2129, dtreves@ius.edu