BEGÜM D. TOPÇUOĞLU

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OBJECTIVE

Integrate data science and biology to improve human health

SKILLS

Python, R, Git, Bash, sklearn, PyTorch, mothur, RNAseq, transcriptomics, 16S amplicon sequencing, anaerobic culturing

QUALIFICATION SUMMARY

- **PhD level microbiologist with background in bioinformatics. Expertise in analyzing wide range of research data.**
  - Programming languages: Python, R.
  - Computer platforms and applications: Linux-based HPC, Cloud and Galaxy platforms.
  - Bioinformatic tools: mothur, BBMap, STAR, DESeq2.
- **Bioinformatics accomplishments:**
  - Developed a machine learning pipeline for microbiome-based classification problems.
    - ML Tools: sklearn, PyTorch, caret.
  - Curated, managed and analyzed 16S rRNA gene sequence and transcriptomic data.
- **Wet lab experience in microbiology and molecular biology.**
- **Strong communication and collaboration skills.**

EDUCATION

DOCTOR OF PHILOSOPHY **2012 - 2018**
UNIVERSITY OF MASSACHUSETTS
Curtis B. Thorne Outstanding Graduate Student Award
American Geophysical Union Outstanding Student Paper Award

BACHELOR OF SCIENCE **2007-2011**
SABANCI UNIVERSITY

SELECTED PUBLICATIONS (TOTAL 9)

- **Topçuoğlu, BD**., Lesniak NA, IV Ruffin MT, Wiens, J, Schloss PD. (2019) Effective application of machine learning to microbiome based classification problems. BioRxiv, 775411.
- **Topçuoğlu, BD.,** Meydan, C., Nguyen TB., Lang SQ., and Holden, JF. (2019). Growth kinetics, carbon isotope fractionation, and gene expression in the hyperthermophile *Methanocaldococcus Jannaschii* during hydrogen-limited growth and interspecies hydrogen transfer. Appl. Environ. Microbiol. 85 (9) e00180-19.
- **Topçuoğlu, BD**., Meydan, C., Orellana, R. and Holden, JF. (2018). Formate hydrogenlyase and formate secretion ameliorate H_2 inhibition in the hyperthermophilic archaeon *Thermococcus paralvinellae*. Environ Microbiol, 20: 949-957.

REFERENCES

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EXPERIENCE

UNIVERSITY OF MICHIGAN **2018 - CURRENT**
POST-DOCTORAL RESEARCH FELLOW
Research Area: Bioinformatics and GI Bacterial Microbiome
Skills Acquired: Python, R, Git, Next-gen sequencing, machine learning.
Projects: Analyzed large scale bacterial microbiome data sets for interactions with the human host. Used general statistical concepts and machine learning to early detect colorectal cancer.
Publications: 1 **International Conferences:** 1

UNIVERSITY OF MASSACHUSETTS **2012 - 2018**
PhD CANDIDATE
Research Area: Environmental Microbiology and Microbial Physiology
Skills Acquired: Metabolic network modeling, RNAseq, anaerobic culturing, chemostat growth.
Projects: Participated in oceanic expeditions and developed new methods at the bench to study subsurface microbiology, microbial physiology of extremophiles and inter-species interactions.
Publications: 8 **International Conferences:** 6

SELECTED PRESENTATIONS (TOTAL 9)

- **Topçuoğlu BD**. Evaluation of Machine Learning Methods that Identify Colorectal Lesions with Microbiota-Associated Biomarkers. *American Society of Microbiology Annual Meeting 2019.*
- **(Invited) Topçuoğlu BD**, Holden JF. Stress management skills in the subsurface: H_2 stress on thermophilic heterotrophs and methanogens. *American Geophysical Union Fall Meeting 2017.*

LEADERSHIP AND MENTORSHIP

- Chair of Inaugural 2016 Pioneer Valley Microbiology Symposium.
- Member of Diversity, Equity, Inclusion Committee at University of Michigan *(2018-present).*
- Instructor for non-profit Software Carpentry *(2018-present).*
- Instructor for Medical Microbiology and Environmental Microbiology Courses at University of Massachusetts *(2015-2018).*
- Research Mentor to four undergraduate researchers and one visiting scholar *(2015-2019).*