Kelly Sovacool

PhD Candidate

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Education

2018-present **PhD Bioinformatics**, *Dept. of Computational Medicine and Bioinformatics*, University of Michigan.
- Advisor: Patrick D. Schloss

2014-2018 **BS Biology**, *Dept. of Biology*, University of Kentucky.
- Minor: Computer Science

Research Experience

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2019-present **Graduate Student Researcher**, *Schloss Lab, Dept. of Microbiology and Immunology*, University of Michigan.
- Develop and benchmark bioinformatics pipelines and software for microbial ecology.
- Analyze 16S rRNA gene amplicon sequence data.
- Apply machine learning methods to gut microbiome classification problems in colorectal cancer and _C. difficile_ infection.
- Collaborate with other scientists on microbiome projects and mentor junior lab members.

2018-2019 **Rotation Student Researcher**, *Program in Biomedical Sciences*, University of Michigan.
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2015-2018 **Undergraduate Lab Assistant**, *Moseley Bioinformatics Lab, Dept. of Molecular and Cellular Biochemistry*, University of Kentucky.
- Developed a computational tool in Python for identifying sets of orthologous and paralogous gene products in whole genomes to facilitate collinearity analysis and detection of gene duplication events.

2016-2018 **BIO395 Independent Research Student**, *Weisrock Lab, Dept. of Biology*, University of Kentucky.
- Developed bash scripts and a SNP calling pipeline in Snakemake.
- Population structure analysis of the _Ambystoma tigrinum_ species complex.
- Bayesian species delimitation of the _Desmognathus fuscus_ species complex.

2015-2016 **Undergraduate Lab Assistant**, *Jaromczyk Lab, Dept. of Computer Science*, University of Kentucky.
- Maintained the _Epichloë festucae_ genome project database.
- Analyzed RNA-seq data of _Chenopodium quinoa_ and coffee ringspot virus.

Teaching Experience

Jan-Apr 2023 **Graduate Student Instructor**, *Dept. of Computational Medicine & Bioinformatics*, University of Michigan.
- BIOINF 576: Tool Development for Bioinformatics

2019-2022 **Facilitator & Capstone Project Mentor**, *Girls Who Code at U-M DCMB*, University of Michigan.
- Weekly Club during the school year and week-long Summer Experience for high schoolers to learn Python for data science

2018-present **Workshop Instructor & Helper**, *U-M Carpentries*, University of Michigan.
- 2-day Software Carpentry workshops teaching computational skills for reproducible research

Jun 2022 **Instructor**, Virtual.
- Intro to R & RNA-Seq Workshop for ASM Microbe conference attendees

Apr 2019 **DNA Day Ambassador**, *Michigan DNA Day*, Pioneer High School, Ann Arbor, MI.
- Epigenetics & Scientific Journeys

Mar 2019 **Workshop helper**, *Graduate Society of Black Engineers and Scientists*, University of Michigan.
- Data Visualization with Python Workshop

Mar 2019 **Capstone Activity Leader**, *Females Excelling More in Math, Engineering, & the Sciences*, University of Michigan.
- Binary Numbers through Ozobots with GWC at U-M DCMB

2012-2018 **Tutor**, *freelance*.
- for high school and college students in Biology, Calculus, Chemistry, Computer Science, and Bioinformatics.

Publications

***** Indicates co-first author

1. Goodin, M. M., Farman, M., Inocencio, H., Jang, C., Jaromczyk, J. W., Moore, N., & Sovacool, K. L. (2016, August). Processing RNA-Seq data of plants infected with coffee ringspot virus. *Proceedings of the 15th Annual UT-KBRIN Bioinformatics Summit 2016: Cadiz, KY, USA. 8-10 April 2016*. `https://doi.org/10.1186/s12859-016-1154-y`

2. Hagan, A. K., Lesniak, N. A., Balunas, M. J., Bishop, L., Close, W. L., Doherty, M. D., Elmore, A. G., Flynn, K. J., Hannigan, G. D., Koumpouras, C. C., Jenior, M. L., Kozik, A. J., McBride, K., Rifkin, S. B., Stough, J. M. A., Sovacool, K. L., Sze, M. A., Tomkovich, S., Topcuoglu, B. D., & Schloss, P. D. (2020). Ten simple rules to increase computational skills among biologists with Code Clubs. *PLoS Comput Biol*, *16*(8), e1008119. https://doi.org/10.1371/journal.pcbi.1008119
3. Everson, K. M., Gray, L. N., Jones, A. G., Lawrence, N. M., Foley, M. E., Sovacool, K. L., Kratovil, J. D., Hotaling, S., Hime, P. M., Storfer, A., Parra-Olea, G., Percino-Daniel, R., Aguilar-Miguel, X., O'Neill, E. M., Zambrano, L., Shaffer, H. B., & Weisrock, D. W. (2021). Geography is more important than life history in the recent diversification of the tiger salamander complex. *PNAS*, *118*(17). https://doi.org/10.1073/pnas.2014719118
4. *Topçuolu, B. D., *Lapp, Z., *Sovacool, K. L., Snitkin, E., Wiens, J., & Schloss, P. D. (2021). Mikropml: User-Friendly R Package for Supervised Machine Learning Pipelines. *JOSS*, *6*(61), 3073. https://doi.org/10.21105/joss.03073
5. *Duda, M., *Sovacool, K. L., Farzaneh, N., Nguyen, V. K., Haynes, S. E., Falk, H., Furman, K. L., Walker, L. A., Diao, R., Oneka, M., Drotos, A. C., Woloshin, A., Dotson, G. A., Kriebel, A., Meng, L., Thiede, S. N., Lapp, Z., & Wolford, B. N. (2021). Teaching Python for Data Science: Collaborative development of a modular & interactive curriculum. *JOSE*, *4*(46), 138. https://doi.org/10.21105/jose.00138
6. *Lapp, Z., *Sovacool, K. L., Lesniak, N., King, D., Barnier, C., Flickinger, M., Krüger, J., Armour, C. R., Lapp, M. M., Tallant, J., Diao, R., Oneka, M., Tomkovich, S., Anderson, J. M., Lucas, S. K., & Schloss, P. D. (2022). Developing and deploying an integrated workshop curriculum teaching computational skills for reproducible research. *JOSE*. https://doi.org/10.21105/jose.00144
7. Sovacool, K. L., Westcott, S. L., Mumphrey, M. B., Dotson, G. A., & Schloss, P. D. (2022). OptiFit: An Improved Method for Fitting Amplicon Sequences to Existing OTUs. *mSphere*. https://doi.org/10.1128/msphere.00916-21 1752 N St., N.W., Washington, DC
8. Barron, M. R., Sovacool, K. L., Abernathy-Close, L., Vendrov, K. C., Standke, A. K., Bergin, I. L., Schloss, P. D., & Young, V. B. (2022). Intestinal Inflammation Reversibly Alters the Microbiota to Drive Susceptibility to Clostridioides difficile Colonization in a Mouse Model of Colitis. *mBio*, *0*(0), e01904–22. https://doi.org/10.1128/mbio.01904-22
9. Armour, C. R., Sovacool, K. L., Close, W. L., Topçuolu, B. D., Wiens, J., & Schloss, P. D. (2022). Streamlined implementation of a machine learning model to classify screen relevant neoplasia using reference-based OTU clustering. *bioRxiv*. https://doi.org/10.1101/2022.09.01.506299