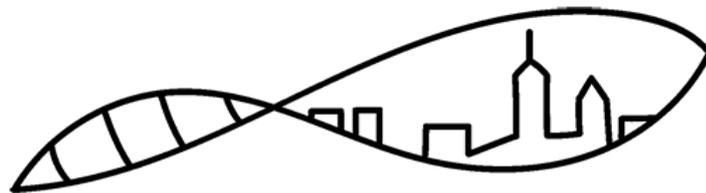


# REMNET

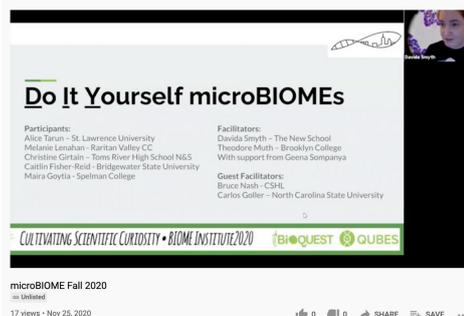


## RESEARCH EXPERIENCES IN MICROBIOMES NETWORK NEWSLETTER

NOV. 2020, ISSUE 9

### Happy Thanksgiving from REMNet!

We are approaching the end of the semester and already the holiday season is in full swing. 2020 has been a challenging year but we have much to be thankful for. Here is some of what we over at REMNet are grateful for. We as always are grateful for you all! You are part of a community of microbiome researchers and educators 198 strong!



We welcomed new members and grew our partnership with the QUBES and BioQuest. Learn about our working group [here](#) and what we are planning for Spring 2021



We had help from Carlos Goller from NCSU and Bruce Nash from Cold Spring Harbor Laboratories. We learned so much from you!!



### We are grateful for our wonderful manager Geena Sompayna

Geena keeps our project running and handles all your queries. We would be lost without her!

Thanks Geena for all you do!

### UPCOMING EVENTS:

**ASM NGS:** 12/07/20 - 12/11/20

ONLINE

REGISTRATIONS OPENS 11/02/20

**AACU Annual:** 01/20/21 - 01/23/21

REGISTRATION OPEN NOW

**Michigan ASM:** 03/21/21

**ASM Microbe:** 06/03/21 - 06/07/2021

**AAEEBL:** July 2021

**ESA Mid-Atlantic:** October 2021

**South Central ASM:** 10/21/21 - 10/23/21

If you have other events we can share here .

Email us: [ugmicronet@gmail.com](mailto:ugmicronet@gmail.com)

### Upcoming REU Deadlines

**NSF BIT SURE** - 02/14/21

NC State University



# REMNet has a paper published!



## Microbiomes for All

Theodore R. Muth<sup>1,2\*</sup> and Avrom J. Caplan<sup>3</sup>

<sup>1</sup> Department of Biology, Brooklyn College of The City University of New York, Brooklyn, NY, United States, <sup>2</sup> Molecular, Cellular, and Developmental Biology Department at The Graduate Center of The City University of New York, New York, NY, United States, <sup>3</sup> Department of Biology, Dyson College of Arts and Sciences, Pace University, New York, NY, United States

Our review article discusses the potential of microbiome research being integrated into a variety of classes by using a number of different modalities. The article describes our experience scaling-up and implementing microbiome projects at a range of institutions across the US and provides insights into strategies that work well. It also describes how to diminish common hurdles that are encountered when implementing undergraduate microbiome research projects. Lastly it demonstrates how course-based microbiome research can be leveraged to help faculty make advances in their own research and professional development. Resources that are available to support faculty interested in integrating microbiome research into their courses are also listed.

### OPEN ACCESS

**Edited by:**  
Carolee Christopher Collier,  
North Carolina State University,  
United States

**Reviewed by:**  
Katherine Amato,  
Northwestern University,

Microbiome research projects are often interdisciplinary, involving fields such as microbiology, genetics, ecology, evolution, bioinformatics, and statistics. These research projects can be an excellent fit for undergraduate courses ranging from introductory biology labs to upper-level capstone courses. Microbiome research projects can attract the interest of students majoring in health and medical sciences, environmental sciences, and agriculture, and there are meaningful ties to real-world issues relating to human health, climate change, and environmental sustainability and resilience in pristine, fragile ecosystems to bustling urban centers. In this review, we will discuss the potential of microbiome research integrated into classes using a number of different modalities. Our experience scaling-up and implementing microbiome projects at a range of institutions across the US has provided us with insight and strategies for what works well and how to diminish common hurdles that are encountered when implementing undergraduate microbiome research projects. We will discuss how course-based microbiome research can be leveraged to help faculty make advances in their own research and professional development and the resources that are available to support faculty interested in integrating microbiome research into their courses.

**Keywords:** undergraduate research, microbiology education, big data, data analysis, microbiomes, course-based undergraduate research

## Preparing for Spring?

REMNet needs your help once more. Share your resources for teaching with us here if you can? This Spring we started our resource to share microbiology teaching materials with you all. We have learned so much and have many more resources we've used and experienced. Please share them here with all of us at REMNet. Click on the QR Code to get to our editable document. We are working on getting some guides ready for you all to use with Nephele and KBase.



We are excited to try PUMAA that has emerged from Jordan Parker's lab! Congrats to you all!!

## PUMAA: A Platform for Accessible Microbiome Analysis in the Undergraduate Classroom

Keith Mitchell<sup>1</sup>, Jiem Ronas<sup>2</sup>, Christopher Dao<sup>3</sup>, Amanda C. Freise<sup>4</sup>, Serghei Mangut<sup>5</sup>, Casey Shapiro<sup>6</sup> and Jordan Moberg Parker<sup>7</sup>\*

<sup>1</sup>Department of Microbiology, Immunology and Molecular Genetics, University of California, Los Angeles, Los Angeles, CA, United States

<sup>2</sup>Department of Clinical Pharmacy, School of Pharmacy, University of Southern California, Los Angeles, CA, United States

<sup>3</sup>Center for Educational Assessment, Center for the Advancement of Teaching, University of California, Los Angeles, Los Angeles, CA, United States

Improvements in high-throughput sequencing makes targeted amplicon analysis an ideal method for the study of human and environmental microbiomes by undergraduates. Multiple bioinformatics programs are available to process and interpret raw microbial diversity datasets, and the choice of programs to use in curricula is largely determined by student learning goals. Many of the most commonly used

Bioinformatics, 31(8), 2018, 1411–1413  
doi: 10.3389/fbioinf.2018.00117  
Advance Access Publication Date: 3 October 2017  
Applications Note



### KBase: Microbiome and Phylogenomics Capabilities

Dylan Chivian<sup>1</sup> (DCCChivian@lbl.gov), Adam P. Arkin<sup>1</sup>, Robert Cottingham<sup>2</sup>, Chris Henry<sup>3</sup>, Benjamin Allen<sup>4</sup>, Jason Baumohl<sup>1</sup>, Jay Bolton<sup>1</sup>, Shane Canon<sup>1</sup>, Stephen Chan<sup>1</sup>, John-Marc Chandonia<sup>1</sup>, Zachary Crockett<sup>2</sup>, Paramvir Dehal<sup>1</sup>, Meghan Drake<sup>1</sup>, Jataka N. Edirisinghe<sup>2</sup>, José P. Faria<sup>2</sup>, Annette Greiner<sup>1</sup>, Tianhao Gu<sup>1</sup>, James Jeffreys<sup>2</sup>, Marcin P. Joachimiak<sup>1</sup>, Sean Jungbluth<sup>1</sup>, Roy Kaminuma<sup>1</sup>, Keith Keller<sup>1</sup>, Vivek Kumar<sup>1</sup>, Sunita Kumar<sup>1</sup>, Miriam Lani<sup>1</sup>, Sebastian Le Bras<sup>1</sup>, Zhenyuan Lu<sup>1</sup>, Akiko Marukawa<sup>1</sup>, Sean McCorkle<sup>1</sup>, Cheyenne Nelson<sup>1</sup>, Dan Murphy-Olsen<sup>2</sup>, Erik Pearson<sup>1</sup>, Gavin Price<sup>1</sup>, Priya Ranjan<sup>1</sup>, William Richi<sup>1</sup>, Boris Sadkhin<sup>1</sup>, Samuel Seaver<sup>1</sup>, Alan Selman<sup>1</sup>, Gwenth Terry<sup>1</sup>, James Thomson<sup>1</sup>, Doreen Ware<sup>2</sup>, Pamela Weisenhorn<sup>1</sup>, Elisha Wood-Charlson<sup>1</sup>, Shinjae Yoo<sup>1</sup>, Qizhi Zhang<sup>2</sup>

<sup>1</sup>Lawrence Berkeley National Laboratory, Berkeley, CA; <sup>2</sup>Argonne National Laboratory, Argonne, IL; <sup>3</sup>Oak Ridge National Laboratory, Oak Ridge, TN; <sup>4</sup>Broskhaven National Laboratory, Upton, NY; <sup>5</sup>Cold Spring Harbor Laboratory, Cold Spring Harbor, NY.

<http://kbase.us>

**Project Goals:** The Department of Energy Systems Biology Knowledgebase (KBase) is a knowledge creation and discovery environment designed for both biologists and bioinformaticians. KBase integrates a large variety of data and analysis tools, from DOE and other public services, into an easy-to-use platform that leverages scalable computing infrastructure to perform sophisticated systems biology analyses. KBase is a publicly available and developer extensible platform that enables scientists to analyze their own data within the context of public data and share their findings across the system.

### Sequence analysis

## Nephele: a cloud platform for simplified, standardized and reproducible microbiome data analysis

Nick Weber, David Liou, Jennifer Dommer, Philip MacMenamin, Mariam Quinones, Ian Misner, Andrew J. Oler, Joe Wan, Lewis Kim, Meghan Coakley McCarthy, Samuel Ezej, Karlynn Noble and Darrell E. Hurt\*

Bioinformatics and Computational Biosciences Branch, Office of Cyber Infrastructure and Computational Biology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD 20892, USA

\*To whom correspondence should be addressed.  
Associate Editor: Bonnie Berger

Received on March 23, 2017; revised on September 20, 2017; editorial decision on September 22, 2017; accepted on September 28, 2017

## Be thankful for your gut microbes this Thanksgiving

Open Science Series | By Quent | November 23, 2017 3:42 AM



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[EMAIL ADDRESS] [SIGN UP]

By: Daniel McDonald  
While you kick back and relax after your Thanksgiving dinner, your gut microbes – the collection of beneficial microbes, mostly bacteria, that inhabit your lower intestine – will be hard at work breaking down the food you ate and carrying out all kinds of other essential functions. Research on the microbes that call your intestine home has shown they can affect your brain, treat a hospital-acquired condition called Clostridium difficile infection (CDI), and much more. Did you know that you can change them by exercise or travel, and you can change them much more by yoga? Since 2012, the American Gut Project (AGP) has been collecting gut microbiome data from citizen scientists all over the world to understand the extent of microbial diversity associated with humans. In the five years since the AGP launch, over 10,000 citizen scientists have contributed to our rapidly evolving knowledge of the human microbiome (the bacteria, fungi, archaea, and viruses that inhabit the human body). We're revolutionizing our understanding of what the microbiome is connected to and what factors may change it. We launched the AGP our Thanksgiving in 2012, a time of the year when a lot of Americans are thinking about their gut. We had been working on the National Institutes of Health-funded Human Microbiome Project (HMP), which had generated a huge amount of public

### RELATED CONTENT



## Thanksgiving Microbes: Gut-Healthy Foods for the Holidays

Nov. 16, 2017

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The role of microbes in the healthy human gut might be just as complex as the political discourse over the Thanksgiving holiday. In addition to the unique personalities at the dinner table, every person's own gut microbiome varies from the beginning to the end of the digestive tract. However, scientists and dietitians have noticed some common links between the diets and gut microbiota of healthy humans. Such effects can be augmented by certain foods and popular ingredients.



Fruits and Vegetables. Source.

## 2020 has been a very challenging year but we can always give thanks to our microbial friends that are always there for us!

SMARTNEWS Keeping you current

### Thank Soil Microbes for White Truffles' Heavenly Aroma

Bacteria produce the signature smell that truffle-sniffing dogs and pigs pick up on



By Rachel Nauer  
SMITHSONIANMAG.COM  
OCTOBER 1, 2014

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Welcome to Small Things Considered! This blog shares the excitement of unexpected and unusual stories of the microbial world. The main contributors to this blog are listed on your right. But we do not just publish our own content, we have many contributions from students, postdocs, and others. We enjoy this, in part because theirs is a world where scientific communication will increasingly involve social media. And this blog is a social medium. Don't think that we do this to avoid work. We are dedicated editors who spend a lot of time going over the material we receive. We are eager to hear from you, so send us your comments, criticisms, submissions, ideas, or whatever else comes into your mind. Thank you for visiting.

11/27/2020  
Why We're Giving Thanks To Microbes For Stinky Cheese  
16:57 minutes  
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