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Lead Scientist

Welcome to Message in a Bottle, and warm wishes for 2015. For most SEA-PHAGES folks spring semester is well underway, and we are delighted in your successes in isolating over 1200 new phages in 2014. Spectacular! We've been putting our new Illumina MiSeq through its paces and it's been responding well, with over 200 phage genomes completely sequenced. SEA-PHAGES genomes were sequenced in record time this year, and we look forward with anticipation to the annotations and genome comparisons.

About a year ago we assembled SMART (SEA-PHAGES Mycobacteriophage Annotation Review Team) to facilitate the annotation quality control process. SMART is composed of ten SEA-PHAGES faculty led by Welkin Pope, and is working hard to move the backlog of finished and annotated genomes towards GenBank submission. Also, we recently initiated GIFT (Genome Inspection and Finishing Team), which is similarly composed of SEA-PHAGES faculty and led by Dan Russell. A GIFT training workshop run in December prepared GIFT members for expert review of raw genome assemblies, ensuring a swift turnaround of sequences entering the annotation pipeline. We're delighted in the successes of SMART and GIFT and the broad contributions of SEA-PHAGES faculty in streamlining and simplifying these critical quality control processes.

SEVENTEEN NEW SCHOOLS JOINING SEA-PHAGES IN 2015



We are delighted in the robust response to our request for applications for new SEA-PHAGES members and received a total of 44 applications. Unfortunately, we are unable to accommodate all of the applicants this year, but we have identified 17 new schools to join the program in 2015. This is one of the larger groups to join the program and we will run two micro (in situ) workshops in the summer as well as the bioinformatics (in silico) workshop in December. We will be announcing all of the new schools in the near future, and hope that you will join us in

welcoming your new colleagues in Cohort 8. This brings the total number of participating SEA-PHAGES institutions since inception of the program to 105, and we anticipate that around 95 will be active by Fall 2015.

DON'T MISS SOUNDS OF THE SEA

Sounds of the SEA



Had a chance to listen to any episodes of the *Sounds of the SEA* podcast yet? You can access them via [PhagesDB](#) or directly from [iTunes](#). There are now a total of eleven episodes and we will continue to add to the collection in the coming year. In the past few episodes we discuss phage hunting at the University of Louisiana at Monroe and at Gonzaga University, and hear about initiatives to expand the impact of the SEA-PHAGES program and approaches to characterization and clustering of newly characterized phages. Please let us know if there are specific

topics you would like to hear discussed and we will be happy to incorporate them in a future episode.

IMPORTANT DATES

- **February 15, 2015**
Archived samples due! See [phagesdb.org](#) for protocols
- **June 12-14, 2015**
Annual Symposium at JRC
- **June 21-27, 2015**
In situ workshop A at UMBC
- **July 12-18, 2015**
In situ workshop B at UMBC
- More at [seaphages.org](#)

Did you know?

2015: Year of the phage?

In 1915, Frederick Twort working in London described how micrococci became glassy and transparent, and that this 'glassy transformation' could be transferred to fresh bacterial colonies. The property passed through filters and could be serially transmitted.

Twort was clearly hot on the trail and he surely was observing the properties of bacteriophages. However, he was tentative in his conclusions and speculated the effect could be due to a minute bacterium that only grows on living material. It would be another two years before D'Herelle added considerable clarity and the plaque assay for viral enumeration.

For more info, take a read of "[Félix D'Herelle and the origins of molecular biology](#)", by William Summers.

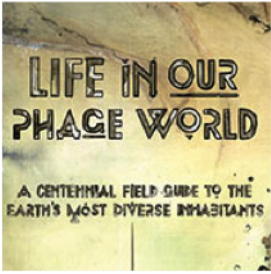
SOFTWARE UPGRADES



We hope that you have had a chance to download **Signals**, an App for SEA-PHAGES faculty and students. It is currently only available for the Android platform, but the iOS version will be available shortly. It is a simple and powerful tool for any phage phinder, but also useful for learning what is going on with phages related to yours. As we noted in Issue #1, you will see some changes in Phamerator this Spring. Using kClust for phamily construction greatly expedites the process and we look forward to efficient addition of newly sequenced genomes to the

Mycobacteriophage_Draft database. Note that as kClust uses different metrics to form phamilies, you will see differences from prior database versions. Watch for more software developments in the coming year.

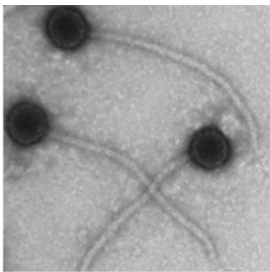
LIFE IN OUR PHAGE WORLD



You may be interested in a new book on bacteriophages “Life in our phage world: A centennial field guide to the Earth’s most diverse inhabitants” by Forest Rohwer, Merry Youle, Heather Maughan and Nao Hisakawa. The book marks the 2015 anniversary of the discovery of bacteriophages by Frederick Twort in 1915, and encompasses a multitude of topics from phage ecology to genes, gene expression, and evolution. It is a quirky and fun read with delightful illustrations throughout and personal accounts from many scientists in the field. It is available as

a free download from <http://2015phage.org/> and also as hard copy from Amazon.com.

PATIENCE IS A VIRTUE



We hope you will enjoy the **recent paper** in *mBio* on the genomic and proteomic characterization of mycobacteriophage Patience. Patience was isolated in South Africa and is a singleton with an unusually low GC% content (50.3%). Identification of Patience virion proteins together with viral proteins expressed in infected cells by LC/MS-MS not only shows that many of the predicted proteins are expressed and that translational start sites are confirmed or revised, but it also provides insights into expression levels that can be correlated with

codon usage biases. These data are consistent with the hypothesis that Patience evolved primarily in lower GC% hosts, entered the mycobacterial environment relatively recently, and is in the process of adapting its codon usage profiles to its new hosts.

SEA HIGHLIGHTS

We are looking forward to the 2015 Annual SEA-PHAGES Symposium at the Janelia Research Campus (June 12-14th), and are delighted that **Eric Betzig** will be our keynote speaker on the Friday evening. Eric shared the Nobel prize for **Chemistry** in 2014 for the development of super-resolved fluorescence microscopy and works at Janelia.

Lu Barker is moving to a new position at FASEB and we will oh so very much miss you Lu. Lu was instrumental in the establishment of SEA-PHAGES and her absence is felt by all of us. Please join us in wishing her all the very best for the exciting experiences ahead of her.

Want to contribute to Message in a Bottle? Send your information to us at info@seaphages.org!

PUBLICATIONS OF INTEREST

- **Grose JH and Casjens SR. (2014).**

Understanding the enormous diversity of bacteriophages: The tailed phages that infect the bacterial family *Enterobacteriaceae*. *Virology* 468-470C, 421-443.

- **Dutta et al. (2014)**

Gp66, a calcineurin family phosphatase encoded by mycobacteriophage D29, is a 2', 3' cyclic nucleotide phosphodiesterase that negatively regulates phage growth. *J. Basic Micro.* 54, 1140-1145.

- **Hatfull (2014)**

Molecular genetics of Mycobacteriophages. *Microbiol. spectrum* 2, 1-36.

- **Pope et al (2014)**

Genomics and Proteomics of Mycobacteriophage Patience: an Accidental Tourist in the *Mycobacterium* neighborhood. *mBio* 5(6):e02145.

THE SEA-PHAGES TEAM:

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David Asai (HHMI)
Billy Biederman (HHMI)
Charlie Bowman (Pitt)
Kevin Bradley (HHMI)
Steve Cresawn (JMU)
Debbie Jacobs-Sera (Pitt)
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SEA-PHAGES: A community of researchers exploring phage diversity

Message in a Bottle
For more information
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