

Simon Roux
Department of Microbiology, Ohio State University

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Columbus, 43210, OH

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EDUCATION

- PhD: Bioinformatics, Ecology and Evolutionary Biology** 2010 - 2013
Title: *Viral Diversity, Ecology and Evolution, from Communities to Genotypes*
Laboratoire Micro-organismes : Génome and Environment, Université Blaise Pascal, CNRS UMR 6023, Clermont-Ferrand, France
- M.S.: Data Analysis and Modeling applied to Life Sciences** 2008 - 2010
Université Blaise Pascal, Clermont-Ferrand, France
- B.S.: Biology** 2005 - 2008
Université Blaise Pascal, Clermont-Ferrand, France

PROFESSIONAL APPOINTMENTS

- Postdoctoral researcher – Tucson Marine Phage Lab (a.k.a. Sullivan's Lab) 2013 - present
Marine phage diversity and virus–host interactions.
University of Arizona, Tucson, AZ, now at Ohio State University, Columbus, OH

PUBLICATIONS

Journal articles

- Roux S**, Enault F, Ravet V, Colombet J, Bettarel Y, Auguet JC, Bouvier T, Soizick L, Vellet A, Prangishvili D, Forterre P, Debroas D, Sime-Ngando T. Analysis of metagenomic data reveals common features of halophilic viral communities across continents. In press at *Environmental Microbiology* 2015
- Roux S**, Hallam SJ, Woyke T, Sullivan MB. Viral dark matter and virus–host interactions resolved from publicly available microbial genomes. *eLife* 4, e08490 2015
- Brum J*, Ignacio-Espinoza J-C*, **Roux S***..., and Sullivan MB. Patterns and ecological drivers of ocean viral communities. *Science* 348 (6237), 1261498 [***co-first authors, listed alphabetically**] 2015
- Lima-Mendez G*, Faust K*, Henry N*, ... **Roux S**, ... Sullivan MB, Bowler C, Karsenti E, de Vargas C, and Raes J. Top-down determinants of community structure in the global plankton interactome. *Science* 348 (6237), 1262073 [***co-first authors**] 2015
- Villar E, Audic S, ... **Roux S**, ... Sullivan MB, Sunagawa S, Wincker P, Zingone A, Karsenti E, Not F, Hingamp P and Iudicone D. Environmental characteristics of Agulhas rings affect inter-ocean plankton transport. *Science* 348 (6237), 1261447 2015

- Roux S**, Enault F, Hurwitz BL, and Sullivan MB. VirSorter: mining viral signal from microbial genomic data. *PeerJ* 3, e985 2015
- Quaiser A, Dufresne A, Ballaud F, **Roux S**, Zivanovic Y, Colombet J, Sime-Ngando T, and Francez A-J. Diversity and comparative genomics of Microviridae in Sphagnum-dominated peatlands. *Frontiers in Microbiology*. 6: 375 2015
- Wood-Charlson EM, Weynberg KD, Suttle CA, **Roux S**, and Van Oppen MJH. Metagenomic characterization of viral communities in corals: mining biological signal from methodological noise. *Environmental Microbiology*. 2015
- Roux S**, Enault F, Ravet V, Pereira O, and Sullivan MB. Genomic characteristics and environmental distributions of the uncultivated Far-T4 phages. *Frontiers in microbiology* 6 2015
- Pascual N, **Roux S**, Artigas J, Pesce S, Leloup J, Tadonleke RD, Debroas D, Bouchez A, and Humbert J-F. A high-throughput sequencing ecotoxicology study of freshwater bacterial communities and their responses to tebuconazole. *FEMS microbiology ecology* 90 (3) 2014
- Roux S**, Hawley AK, Torres Beltran M, Scofield M, ... Woyke T, Hallam S, Sullivan MB. Cultivation-independent exploration of SUP05 virus-host interactions in a model Oxygen Minimum Zone. *ELife* 3: e03125 2014
- Hopkins M, Kailasan S, Cohen A, **Roux S**, Tucker KP, Shevenell A, ... Breitbart M. Diversity of environmental single-stranded DNA phages revealed by PCR amplification of the partial major capsid protein. *The ISME journal*. 8: 2093–2103 2014
- Roux S**, Tournayre J, Mahul A, Debroas D and Enault F. Metavir 2: Comparison of viral metagenomes and analysis of assembled datasets. *BMC Bioinformatics* 15 (76) 2014
- Roux S**, Krupovic M, Debroas D, Forterre P and Enault F. Assessment of viral community functional potential from viral metagenomes may be hampered by contamination with cellular sequences. *Open Biology* 3 (130160) 2013
- Roux S**, Enault F, Bronner G, Vaultot D, Forterre P and Krupovic M. Chimeric viruses blur the border between the major groups of eukaryotic single-stranded DNA viruses. *Nature Communications* 4 (2700) 2013
- Roux S**, Enault F, Debroas D. Application des approches métagénomiques à l'étude de la diversité virale environnementale. *Virologie* (Review Article in French) 2013
- Roux S**, Krupovic M, Poulet A, Debroas D, Enault F. Evolution and Diversity of the Microviridae Viral Family through a Collection of 81 New Complete Genomes Assembled from Virome Reads. *PLoS ONE* 7 (7): e40418. 2012
- Roux S**, Enault F, Robin A, Ravet V, Personnic S, Theil S, Colombet J, Sime-Ngando T, Debroas D. Assessing the Diversity and Specificity of Two Freshwater Viral Communities through Metagenomics. *PLoS ONE* 7 (3): e33641. 2012
- Roux S**, Faubladier M, Mahul A, Paulhe N, Bernard A, Debroas D, Enault F. Metavir: a web server dedicated to virome analysis. *Bioinformatics* 27 (21):3074-5. 2011
- Roux S**, Enault F, Bronner G, Debroas D. Comparison of 16S rRNA and protein-coding genes as molecular markers for assessing microbial diversity (Bacteria and Archaea) in ecosystems. *FEMS Microbiol Ecol*. 78 (3):617-28. 2011

Manuscripts in submission

- Guidi L*, Chaffron S*, Bittner L*, ..., **Roux S**, ... and Gorsky G. Plankton networks driving carbon export in the oligotrophic ocean. In revision at *Nature*. [*co-first authors] 2015

Brum J*, Ignacio-Espinoza J-C*, Kim EH*, Trubl G, Jones R, **Roux S**, VerBerkmoes N, Rich V, Sullivan M. Illuminating structural proteins in viral metagenomic 'dark matter'. Submitted to *eLife*. [*co-first authors, listed alphabetically] 2015

Manuscripts in preparation

Hargreaves K, **Roux S**, ..., Sullivan MB. A C. difficile prophage census; exploring their diversity and carriage in disease and non-disease associated isolates. 2015

Howard-Varona C, **Roux S**, ... Sullivan MB. Transcriptional dynamics of phage ϕ 38:1 and two *Cellulophaga baltica* host strains. 2015

Roux S, ..., Sullivan MB. Quantitative viromes spanning both single-stranded and double-stranded DNA viruses. 2015

Roux S, ..., Sullivan MB. Global Ecogenomics of Ocean Viruses. 2015

AWARDS, HONORS, GRANTS & FELLOWSHIPS

Grants

NSF BioOce Grant (\$851,485), "Ecological impacts and drivers of double-stranded DNA viral communities in the global oceans", PI Matthew B Sullivan, co-wrote the grant application as "key personnel". 2015 - 2018

DGA (French Defense Procurement Agency) PhD grant (\$56,348), "Bioinformatics tool development for viral metagenomics analysis". 2010 - 2013

Award

Best oral presentation (SVSAE, Clermont-Ferrand, France), "Redefining a viral family with complete genomes assembled from viral metagenomes: the case of *Microviridae*". 2012

CONFERENCE AND WORKSHOP PRESENTATIONS

Invited talk

Roux S. Promises and Pitfalls of Viromics analyses, hands-on with Metavir. *A viromics workshop: Tools and Trick to see the 'Virus' in diverse sequence datasets, ASM meeting 2014*. Boston 2014

Roux S, Debroas D, Mahul A, Enault F. Metavir, a web server dedicated to virome analysis : presentation & hands-on training. *Environmental Virology Workshop*. Tucson, AZ 2013

Selected abstracts

Roux S, Brum JR, Ignacio-Espinoza JC, Enault F, Hallam SJ, Woyke T, Sullivan MB. How to swim and not drown in the ocean of viral unknowns. *ASM General Meeting*, New Orleans 2015

Roux S, Hurwitz B, Chourasiya D, Sullivan MB. Promises and Pitfall of Virome Bioinformatics Analyses. *Viruses of Microbes III*, Zurich, Switzerland 2014

Roux S, Hawley AK, Torres Beltran M, Scofield M, ... Woyke T, Hallam S, Sullivan MB. Cultivation-independent exploration of SUP05 virus-host interactions in a model Oxygen Minimum Zone. *Viruses of Microbes III*, Zurich, Switzerland (Poster) 2014

Roux S , Enault F, Bronner G, Vaultot D, Forterre P, Krupovic M. Les virus chimeres : une remise en cause des limites entre les principaux groupes de petits virus a ADN simple brin eucaryotes. <i>Colloque AFEM 2013</i> . Parent, France	2013
Roux S. , Enault F., Ravet V., Mahul A., Sime-Ngando T., Debroas D. Assessment of viral communities richness, diversity, and biogeography through viromes comparative analyses. <i>Viruses of microbes</i> . Bruxelles, Belgique. (Poster)	2012
Roux S , Krupovic M, Poulet A, Debroas D, Enault F. Redéfinition d'une famille virale par l'assemblage de génomes complets à partir de données métagénomiques. <i>Journées de l'école doctorale SVSAE</i> . Clermont-Ferrand, France.	2012
Roux S , Enault F, Ravet V, Mahul A, Sime-Ngando T, Debroas D. Étude des communautés virales par approche métagénomique. <i>Rencontre des microbiologiste clermontois</i> . Clermont-Ferrand, France.	2012
Roux S. , Taib N., Mangot J.F., Hugoni M., Mary I., Ravet V., Bronner G., Enault F., Debroas D. Analyse des données de séquençage massif par des méthodes phylogénétiques : outils bioinformatiques dédiés et applications. <i>Colloque Génomique Environnementale</i> , Lyon, France.	2011
Roux S , Enault F, Robin A, Ravet V, Personnic S, Theil S, Colombet J, Sime-Ngando T, Debroas D. Metagenomic analysis of the viral communities from temperate freshwater lakes. <i>Viruses of the environment</i> . Heidelberg, Germany	2011
Roux S . Analysis of metagenomes from lacustrin viral communities. <i>ALPHY : Evolution genomic, Bioinformatics, Alignment and Phylogenies</i> . Lyon, France.	2011
Debroas D, Roux S , Enault F. Study of the viral diversity of two lakes. <i>EC2CO restitution meeting</i> . Toulouse, France (Poster)	2010

STUDENTS MENTORED (as primary, day-to-day supervisor)

Guilhem Doucier, senior master student from ENS Paris, "Automatic taxonomic affiliation via <i>Guilt by contig association</i> in viral metagenomic data".	2014
Jeremy Tournayre, master student from Université Blaise Pascal, "Analysis of viral communities from ancient lake sediments".	2013

TEACHING EXPERIENCE

Graduate

Perl Programming for Biologists	2010 - 2013
Sequence analysis and annotation for Environmental Microbiology	2010 - 2013

Undergraduate

Introduction to Evolutionary Biology	2010 - 2013
Introduction to Statistics applied to Biology	2010 - 2013
Introduction to Genome annotation	2013

SERVICE TO THE PROFESSION

- Manuscript review:** The ISME Journal; Environmental Microbiology; PLoS One; Frontiers In Microbiology; Applied and Environmental Microbiology; Fungal Biology; Aquatic Microbial Ecology; Genomics, Proteomics & Bioinformatics; Infection, Genetics and Evolution; FEMS Microbiology Reviews; Scientific Reports. 2013 - present
- Grant proposal review:** UK Biotechnology and Biological Sciences Research Council. 2013 - present
- Community-available tool (design and maintenance):** Metavir, web server dedicated to virome analysis (<http://metavir-meb.univ-bpclermont.fr>). VirSorter, high-throughput for the automatic detection of viral signal in sequencing datasets (<https://github.com/simroux/VirSorter>). 2011 - present

MEDIA COVERAGE

- “Scientists Unearth a Trove of New Bacteria-Killing Viruses”, Shara Tonn, Wired 2015
- “Scientists Sample the Ocean and Find Tiny Additions to the Tree of Life”, Karen Weintraub, The New York Times 2015

REFERENCES

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