

Simon Roux – Biosketch

Simon Roux is a Staff Scientist at the DOE Joint Genome Institute, where he leads the Viral Genomics group. He received his PhD in 2013 from Université Blaise Pascal (Clermont-Ferrand, France), where he developed new bioinformatic tools for the analysis of “viral metagenomes”, a new type of datasets at the time, and shared them through a web portal (MetaVir). In this PhD work, he also performed global comparisons of environmental viral communities across ecosystems, and some early exploration of functional diversity in uncultivated viruses. From there, he built upon and expanded this research as a post-doctoral researcher in the Sullivan Lab (University of Arizona, then Ohio State University, USA). His work still combined the development of new bioinformatics tools for viral genome analysis, and coupled metagenome analysis with information derived from other newly developed experimental methods (e.g. single-cell genomics) as well as environmental virus-host model systems available at the Sullivan Lab.

At the JGI, current projects in the Viral Genomics group revolve around the study of viral diversity and virus:host interactions in soil and freshwater environments, along with the development of new bioinformatics tools and experimental protocols to probe and characterize uncultivated viruses. The long-term goals of this research are to better understand the ecological and evolutionary drivers of virus:host dynamics in natural microbial communities. This involves a combination of experimental and computational approaches spanning from the molecular to the ecosystem scale, trying to address fundamental questions such as “how do viruses of microbes spread and adapt across environments?”, “how do viruses take over and reprogram microbial cells?”, and “how do viral infections alter ecosystem and microbiome processes?”.