



University  
of Basel

Department  
Biozentrum



Swiss Institute of  
Bioinformatics

BIOZENTRUM

The Center for  
Molecular Life Sciences

## Basel Computational Biology Seminar

### 21563 Current research in Bioinformatics II



**Diana Fusco**

# Watching phage infection one cell at a time: sources and consequences of stochasticity in lysis time

Bacteriophages, similarly to other viruses, heavily rely on their hosts' molecular machinery for successful replication. Because the bacterial host is itself a living organism, a phage's ability to proliferate is expected to strongly depend on the bacterial physiological state, however, phage-bacteria interactions are traditionally quantified using bulk assays that rely on well-mixed, exponentially growing bacterial cultures that average out the heterogeneity of infections and limit our ability to investigate distinct physiological states.

Here, I will present a novel method that takes advantage of microfluidic mother machine devices and genetically engineered T7 phages to monitor individual phage infections, reveal significant level of heterogeneity in lysis time and burst size, and identify the sources of heterogeneity in each distinct step. Using agent-based modeling, I will show that variability in lysis time can confer unexpected fitness advantages to phages both in serial passage experiments and on bacterial lawns, pointing to noise in life history parameters as a potential trait under selective pressure.

#### Speaker Information

**Name:** Prof. Diana Fusco

**Institute:** University of Cambridge  
United Kingdom



#### Event Details

**Date:** Monday, April 27, 2026

**Time:** 16:15 – 17:15 h

**Location:** Biozentrum, U1.197

**Host:** Ludovico Calabrese

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