

Eawag Seminar Invitation

Single-cell studies of planktonic bacteria: Active and inactive bacteria as measured with different probes

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When **October 14, 11.00 – 12.00 a.m.**
Where **Forum Chriesbach C20, Eawag Dübendorf**

Abstract We have come to know that not all bacteria that we encounter in an aquatic environment are equally active. In fact, most are not active at all. What are the consequences of this fact? Does it matter? How can we know which bacteria are active and which ones are not?

In the last years, a series of strategies have been developed to answer this question. Most are fluorescent probes that target different cell functions and that can inform us of the physiological status of each of the bacteria in a population, what we call the “single-cell” approaches. Some others involve the use of radioactive probes and autoradiography. A review of the published data in which usage of various of these probes is reported for freshwater and marine ecosystems indicate that the dichotomy “active/inactive” does not exist, and that instead, a continuum of physiological states exists from growing and very active bacteria to the really dead and partially-decomposed bacteria.

In my talk I will first review these concepts and the raw data that lets us reach this conclusion, and then I will move forward to the strategies that let us link the cell-specific physiological status and activity with the phylogenetic assignment of each organism. Most particularly I will show data we have acquired using microautoradiography combined to fluorescent in situ hybridization, and flow cytometry cell sorting combined to 454 pyrosequencing of the sorted fractions. Part of these data confirm that bacterial bulk activity is most likely driven by the phylogenetic composition of the community than by the distribution of physiological states within the community.