Eawag
Überlandstrasse 133
8600 Dübendorf
Switzerland
Phone +41 (0)58 765 53 61
Fax +41 (0)58 765 53 75
info@eawag.ch
www.eawag.ch

eawag aquatic research

Eawag Seminar Invitation

Cyanobacteria - what knowledge base do we have for assessing and controlling human health risks and what are key gaps?

Speaker **Dr. Ingrid Chorus**
German Federal Environmental Agency, Germany

When **December 6, 11.00 – 12.00**

Where **Eawag Dübendorf, Forum Chriesbach, room C20**

Abstract Cyanobacterial toxins are – per unit biomass – about as poisonous as toadstools (Knollenblätterpilz; Amanita phalloides, death cap). More than a century ago, exposure to cyanobacteria was occasionally linked to human illness (Haff Krankheit) and animal deaths, and starting in the 1950s researchers began to study the toxicity of cyanobacteria by culturing them in the lab and injecting extracts into the bellies of mice. They found a “slow death factor” (chemically elucidated as cyclic heptapeptides, i.e. microcystins, in the 1960’s) and a fast death factor (later identified as 3 different neurotoxins). Cyanotoxin research intensified as blooms increased in the wake of eutrophication and powerful analytical methods (HPLC, GC-MS) became available to replace i.p. injection into mice. By the early 1990’s the key groups of cyanotoxins were elucidated: microcystins, cylindrospermopsins, saxitoxins, anatoxin-a and anatoxin a(S). Toxicological information is now available to derive chronic and short-term guideline values for most of them. Surprisingly, no new cyanotoxins were elucidated since the 1990s – in spite of a fair amount of research looking for them to explain toxic effects occasionally observed that do not match the symptoms of the known cyanotoxins.

The presentation will give an overview of what we know about cyanotoxins and of the currently exciting research questions, e.g.: What competitive advantage do cyanobacteria gain from these metabolites? How can we identify environmental conditions that favour toxin-producing genotypes over non-producers?

It will show the knowledge gaps to close for better risk management, e.g.: How can we be sure that the cyanobacterial neurotoxins do not cause chronic effects? Can we clarify that without animal experiments?

It will also raise questions to discuss for avoiding prejudice in scientific research, e.g.: Will climate warming really increase cyanobacterial blooms? Is there really evidence that we also need to reduce N and not only P to control them?