

„Microbial dark matter? Fascinating Archaea from the subsurface“

Due to the limited cultivability of the vast majority of microorganisms, researchers have applied molecular technologies to gain insights into the biology of uncultivated archaea and bacteria in their natural biotope. However, the (deeper) subsurface remains a biotope which is hardly accessible and thus model systems are rare.

In this talk, I will summarize the major findings on an uncultivated archaeon (for which we proposed the name *Candidatus Altiarchaeum hamiconexum*), which thrives in the subsurface of cold, anoxic springs. It possesses a complex biology: thriving strictly anaerobically, this microorganism is capable of forming highly-pure biofilms, connecting the cells by extraordinary cell surface appendages (the „hami“) and has other unusual traits, such as a double-membrane cell wall. The *Altiarchaeum* seems to proliferate in deep, anoxic groundwater bearing a potentially very important function: carbon fixation. The research over more than a decade on *Cand. A. hamiconexum* has revealed many interesting features on its lifestyle, its genomic information, metabolism and ultrastructure making this archaeon one of the best studied uncultivated archaea in the literature.