

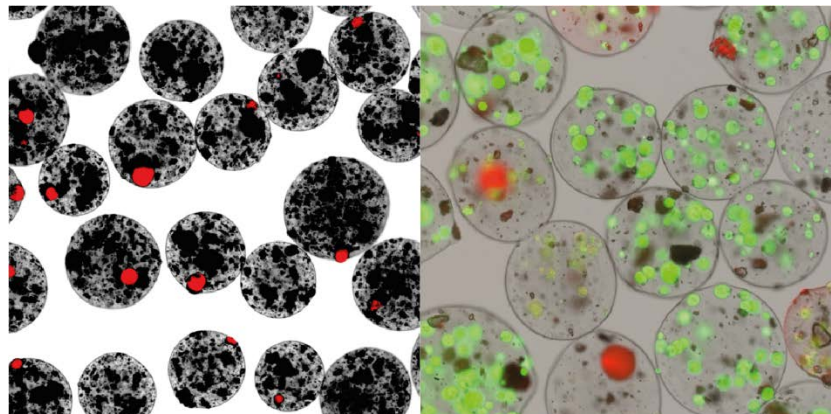
The nanoFleming: Leveraging the Therapeutic Potential of Nature's Microbial Communities

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The rise of antibiotic resistance requires new antimicrobial molecules to safeguard the successes of modern medicine. Natural products were a reliable source for antibiotics in the past and are the basis of approx. 70% of all antibiotic drugs used in clinics today. However, the low-hanging fruits have been harvested and the discovery of microbes secreting truly novel natural products has become exceedingly difficult.

We have developed the *nanoFleming*, a platform targeting several shortcomings of natural product discovery. The technology provides access to rare microbial producers of antimicrobial molecules from natural environments (e.g. soil) by new ways of cultivating these

microorganisms in their natural habitat and native community. Composed of small microspheres that harbor producers as well as target strains, the *nanoFleming* allows for the handling of millions of experiments in parallel. Microorganisms



The *nanoFleming*. Cultivation of soil microorganisms within microspheres. The growth of individual strains (red colonies) can be monitored (left image). The addition of a pathogenic strain in each microsphere (green colonies) allows for the detection soil microorganisms that inhibit the growth of the pathogen (right image).

secreting molecules against the target strains (e.g. bacterial or fungal pathogens) are detected *in situ* without the need for lengthy fermentation and fractionation procedures. Promising candidates are directly isolated by means of flow-cytometry for further characterization.

We will present recent examples of soil microbiome cultivation with the *nanoFleming* platform and provide insights into the microbial diversity using our platform evaluated by 16S rRNA sequencing. We will furthermore discuss other applications of the *nanoFleming* for the discovery and optimization of antimicrobial molecules.