Abstract Submitted
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Interactive Biophysics with Microswimmers: Education, Cloud Experimentation, Programmed Swarms, and Biotic Games INGMAR RIEDEL-KRUSE[1], Bioengineering, Stanford University — Modern biotechnology gets increasingly powerful to manipulate and measure microscopic biophysical processes. Nevertheless, no platform exists to truly interact with these processes, certainly not with the convenience that we are accustomed to from our electronic smart devices. In my talk I will provide the rational for such Interactive Biotechnology and conceptualize its core component, the BPU (biotic processing unit), which is then connected to an according user interface. The biophysical phenomena currently featured on these platforms utilize the phototactic response of motile microorganisms, e.g., Euglena gracilis, resulting in spatio-temporal dynamics from the single cell to the self-organized multi-cellular scale. I will demonstrate multiple platforms, such as scalable biology cloud experimentation labs, tangible museum exhibits, biotic video games, low-cost interactive DIY kits using smartphones, and programming languages for swarm robotics. I will discuss applications for education as well as for professional and citizen science. Hence, we turn traditionally observational microscopy into an interactive experience.

[1]I was told that presenting in the educational section does not count against the "one author - one talk policy" - so I submit two abstracts. In case of conflict - please contact me: ingmar@stanford.edu

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