Abstract Submitted
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BOSO-Micro: The Bank Of Swimming Organisms at the Micron Scale[1] ERIC LAUGA, MARCOS F. VELHO RODRIGUES, DAMTP, University of Cambridge, MACIEJ LISICKI, Faculty of Physics, University of Warsaw — Unicellular microscopic organisms living in aqueous environments outnumber all other creatures on Earth. A large proportion self-propel in fluids with a vast diversity of swimming gaits and motility patterns. Here we introduce the BOSO-Micro database (acronym for Bank Of Swimming Organisms - Microscopic), a survey of the available experimental data produced to date [August 2020] on the motile behaviour of four broad categories of unicellular microswimmers: bacteria (and archaea), flagellated eukaryotes, spermatozoa and ciliates. Whenever possible, we first gathered the following parameters: species, geometry and size of the organisms, swimming speeds, actuation frequencies, actuation amplitudes, number of flagella/cilia and properties of the surrounding fluid. We then analyse the data in the light of the established fluid mechanics principles for propulsion at low Reynolds numbers. We reproduce expected scalings for the locomotion of cells within the same taxonomic groups of organisms while demonstrating the variability for organisms of different species within a group. The material gathered in our work is a summary of the established knowledge in the domain, providing a convenient and practical reference point for future studies while highlighting uncharted territories.

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