When biology inspires fluid mechanics
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Research in fluid mechanics has long been motivated by the desire to understand the world around us. Biology, in particular, is dominated by transport problems involving fluids, from diffusion of nutrients and locomotion at the cellular level to flows around plants and the circulatory system of animals, and as such the biological realm is a constant source of inspiration for fluid mechanicians. In this talk I will highlight recent work in my group where fluid mechanics problems are inspired by small-scale biology. I will first focus on motile bacteria, from their individual and collective dynamics to their interactions with viruses. I will then highlight our research on the distribution of swimming speeds for eukaryotic organisms. Finally, I will show how cell locomotion can be used as a source of inspiration to design and optimise artificial swimmers and pumps.