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【942】Probing the role of hydrodynamic interactions in metachronal wave formation in dense ciliary arrays

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Self-organization in biological systems is crucial for coordinating vital functions. One such example is the collective motion of slender cellular appendages called cilia. In dense arrays, neighboring cilia beat with a phase shift, forming metachronal waves essential for large-scale flow generation. Despite their prevalence, the mechanisms governing cilia patterns and their connection to flow parameters remain unclear. Using high spatio-temporal imaging and quantitative image analysis, we characterize metachronal patterns in the living unicellular organism *Didinium nasutum*. By manipulating external flow properties like viscosity, we aim to quantify the extent of cilia responses to hydrodynamic forces, shedding light on the interplay between cilia coordination and fluid dynamics.

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