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The unique low-Reynolds-number spinning hydrodynamics of release of a giant multinucleate multiflagellate zoospore JAVIER URZAY, Stanford University, DONALD OTT, University of Akron, MANU PRAKASH, Stanford University — Asexual reproduction in aquatic algal species of Vaucheria occurs by the formation of large multinucleate zoospores formed within elongated club-shaped zoosporangia at the tips of young branches. During development, the zoosporangia are separated from the rest of the thallus by membranes, resulting in multiple chambers hosting zoospores which will be released and dispersed in the surrounding aqueous environment. The apical gelatinization of the zoosporangial tip, together with the turgor pressure in the segregated portion of the filament, lead to a narrow aperture through which the zoospore escapes. However ordinary this may seem, Vaucheria zoospores have a unique multiflagellated patterned surface that warrants helicoidal flow entrainment at relatively high speeds, and which enables them to undergo a spinning motion that elastohydrodynamically assists the rather unfavorable escape maneuver. Experimental observations of this phenomenon, together with quantitative interpretations, are provided in this talk.

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