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Undulatory swimming in a viscoelastic fluid[1]

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Mammalian spermatozoa encounter complex, non-Newtonian fluid environments as they make their way through the female reproductive tract. The beat form realized by the flagellum varies tremendously along this journey. We will present recent progress on the development of computational models that couple the internal force generation of undulating flagella with the external dynamics of a complex fluid. An immersed boundary framework is used, with the complex fluid represented either by a continuum Oldroyd-B model, or a Newtonian fluid overlaid with discrete viscoelastic elements.

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