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The effects of knot topology on the collapse of active polymers

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We use numerical simulations to study tangentially active flexible ring polymers with different knot topologies. Simple, unknotted active rings display a collapse transition upon increasing the degree of polymerization. We find that topology has a significant effect on the polymer size at which the collapse takes place, with twist knots collapsing earlier than torus knots. We rationalize this behavior as a consequence of the propensity for non-neighboring bonds of torus knots to be aligned with each other, thus avoiding collisions that would eventually lead to a MIPS-like collapse.

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