

Abstract Submitted
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Dynamics of asexual reproduction in planarians EVA-MARIA SCHOETZ, BRYAN LINCOLN, SOFIA QUINODOZ, Princeton University — Planaria research is experiencing a resurgence due to the development of molecular tools, the Planarian genome project and database resources. Despite the resulting progress in planarian biology research, an extensive study of their physical properties remains to be undertaken. We developed a method to collect a large amount of data on the dynamics of clonal reproduction in the freshwater planarian *S.mediterranea*. The capability of planarians to regenerate an entire organism from a minuscule body part is based on a homogeneously distributed stem cell population that comprises 25-30% of all cells. Due to this stem cell contingent, planarians can reproduce spontaneously by dividing into a larger head and a smaller tail piece, which then will rebuild the missing body parts, including a central nervous system, within about a week. Time-lapse imaging allows us to characterize the fission process in detail, revealing the stages of the process as well as capturing the nature of the rupture itself. A traction force measurement setup is being developed to allow us to quantify the forces planarians exert on the substrate during reproduction, a macroscopic analog to the Traction Force Microscopy setups used to determine local cellular forces. We are particularly interested in the molecular processes during division and the interplay between tissue mechanics and cell signaling.

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