

Abstract Submitted  
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**Dynamics of asexual reproduction in flatworms** EVA-MARIA SCHOETZ, JARED TALBOT, Princeton University, JOERN DUNKEL, University of Oxford — Planarians (flatworms) are one of the simplest bilaterally symmetric organisms and famous for their extraordinary regenerative capabilities. One can cut a worm in 100 pieces and after a few weeks one obtains 100 new worms that have reconstructed their entire body, including a central nervous system. This amazing regenerative capability is due to a population of stem cells distributed throughout the planarian body. These stem cells do not only allow the worms to heal without scarring after wounding, they also allow for asexual reproduction: Planarians can split themselves in two, and then regenerate the missing body parts within about a week. Naively, one would think that this kind of asexual reproduction could be captured by simple models that describe cell growth in bacteria or other lower organisms. However, we find that there is much more to the story by monitoring >15 generations of many individuals, as well as the long-term behavior (> 9 months) of worm populations under different environmental conditions, such as population density, temperature, and feeding frequency. Surprisingly, we observe that reproduction decreases with increasing food supply, opposite to the relationship between food and reproduction in other asexually reproducing organisms (e.g. bacteria, yeast), and causing obese worms. Finally, our data allows us to address the question of aging in an organism that is thought to be “forever young”.

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