

Supplementary Materials for

A cellular platform for the development of synthetic living machines

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The PDF file includes:

Fig. S1. Ectoderm-derived xenobots do not contain neural tissue.

Fig. S2. Xenobot life span can be extended with nutrient-rich media.

Other Supplementary Material for this manuscript includes the following:

(available at robotics.sciencemag.org/cgi/content/full/6/52/eabf1571/DC1)

Movie S1 (.mp4 format). Time-lapse videos of synthetic organisms moving through aqueous environments.

Movie S2 (.mp4 format). Collective particle aggregation in simulated synthetic organisms.

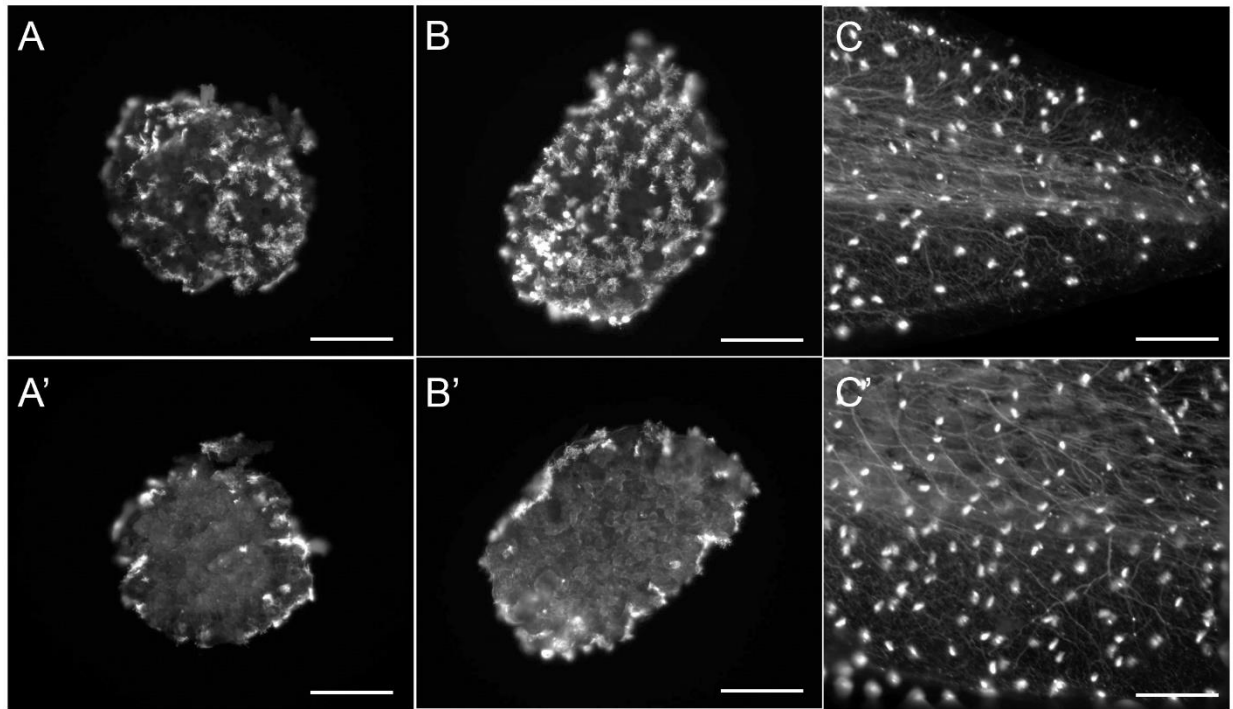


Fig. S1. Ectoderm-derived xenobots do not contain neural tissue. Small (A, A') and large (B, B') Xenobots were fixed, bisected, and processed with anti-acetylated tubulin immunohistochemistry. Visualization of the fluorescent secondary reveals the presence of multiciliated cells along the surface of the xenobot, but no neurons were present externally or internally ($n = 24$). Similarly, young tadpoles also possess multiciliated cells across the epidermis of their tail (C) and trunk (C'). However, in the case of tadpoles, motor axons are present between the somites and peripheral nerves are observed throughout the fin tissue. Scale bars indicate $250\mu\text{m}$.

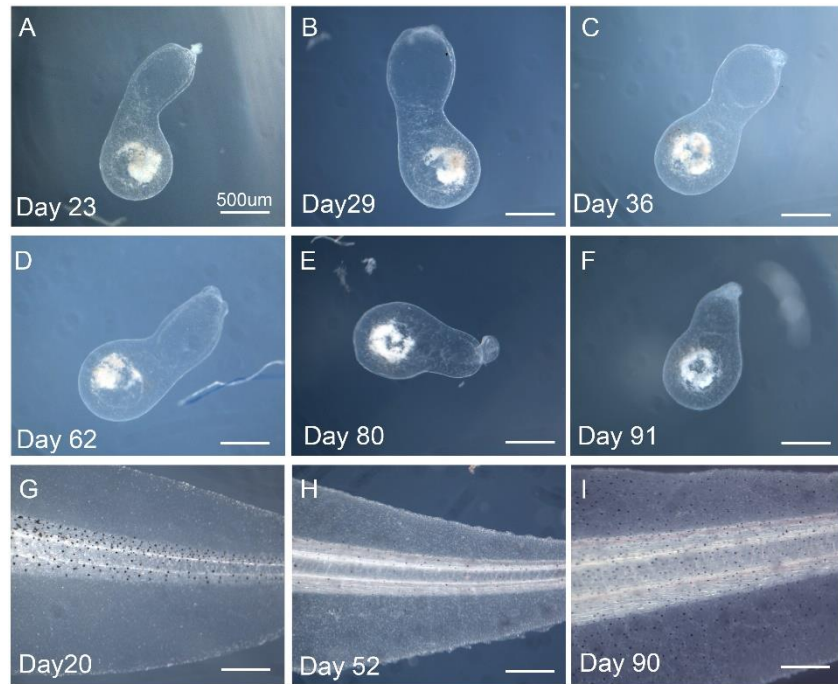


Fig. S2. Xenobot life span can be extended with nutrient-rich media. Reared in standard 0.75x MMR, xenobots live an average of 10 days post excision, metabolizing yolk platelets maternally loaded into the embryo. However, this lifespan can be extended for a period of months (A-F) with the addition of nutrient rich culture media. Under these conditions, xenobots gradually lose pigmentation and become transparent, similar to the epidermis of a developing tadpole tail fin (G-I). Scale bars indicate 500 μ m.