

Programming self-organizing multicellular structures with synthetic cell-cell signaling

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Science **361** (6398), 156-162.

DOI: 10.1126/science.aat0271 originally published online May 31, 2018

Engineering multilayered cellular structures

The ability to program the manufacture of biological structures may yield new biomaterials or synthetic tissues and organs. Toda *et al.* engineered mammalian "sender" and "receiver" cells with synthetic cell surface ligands and receptors that controlled gene regulatory circuits based on Notch signaling. Programming the cells to express cell adhesion molecules and other regulatory molecules enabled spontaneous formation of multilayered structures, like those that form during embryonic development. The three-layered structures even showed regeneration after injury.

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