

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

The dynamics of body elongation in vertebrate morphogenesis IDO REGEV, Harvard School of Engineering and Applied Science, OLIVIER POURQUIÉ, Harvard Medical School/Brigham and Women's Hospital, L. MAHADEVAN, Harvard School of Engineering and Applied Science — Vertebrate embryos have a body axis that grows by the addition of cells in a posterior growth zone in the embryo. Experiments show that these cells show a gradient in motility that decays towards the anterior of the embryo, consistent with a degradation of specific cellular signals (FgF) that control cellular motility. However, this motility is primarily diffusive in nature, and converted into an advective gradient by virtue of inhomogeneous confinement. We use these observations to build a minimal mechanochemical model for tissue extension as a function of FgF activity, cell motility and tissue rheology with results that allow us to explicitly test the model in a variety of in-vivo and ex-vivo situations, with implications for normal and pathological axis elongation.

Ido Regev
Harvard School of Engineering and Applied Science

Date submitted: 13 Nov 2014

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