

Abstract Submitted
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Cardiac tissue as a mechanically and electrically active medium

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The heart is an active solid in which energy is injected at the cell scale when cardiomyocytes contract. This energy is transduced up to macroscopic scales, leading to a collective function—the pumping of the heart—in which a wavefront of contraction propagates across the heart from one end to the other. We will present results for a model that couples a traditional model for electrical signaling to an overdamped biphasic model for tissue mechanics to look at the competition between mechanical and electrical signaling in the contractile wavefront in the embryonic heart. We speculate on the ramifications of our results for the adult heart, which is conventionally described exclusively in terms of electrical signaling.

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