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Investigation of Intrinsically Disordered Regions in the *Drosophila* Matrisome

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Abstract: Organ formation is associated with large-scale motion dynamics within the embryo. The protein network that supports cells—Extracellular Matrix (ECM)—has been studied as a passive substrate that functions exclusively to support cell motion and tissue organization. To form tissues and organs, however, embryos need to transport the ECM along with cells as a tissue composite. Although some studies have shown motile ECM in the context of embryogenesis, the material properties that confer ECM with these dynamic roles are poorly understood. Taking a multidisciplinary approach, we test the hypothesis that certain components of the embryonic ECM have fluid-like material properties and may show the potential to form biocondensates as a result of their structural properties. As a starting point for testing our hypothesis, we systematically screened the *Drosophila* matrisome using a computational framework to rank proteins containing intrinsically disordered regions (IDRs). Our computational screening identified at least 30 *Drosophila* matrisome components with high-confidence IDRs, some of which show robust embryonic expression. Ongoing studies examine the biological roles of Fondue, one of these ECM components that exhibit IDRs with high confidence scores.

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