

Abstract Submitted  
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**Dynamic density functional theory of solid tumor growth: Preliminary models** JOHN LOWENGRUB<sup>1</sup>, UC Irvine — Cancer is a complex system whose dynamics and growth result from nonlinear processes coupled across wide ranges of spatio-temporal scales. The current mathematical modeling literature addresses issues at various scales but the development of theoretical methodologies capable of bridging gaps across scales needs further study. We present a new theoretical framework based on Dynamic Density Functional Theory (DDFT) extended, for the first time, to the dynamics of living tissues by accounting for cell density correlations, different cell types, phenotypes and cell birth/death processes, in order to provide a biophysically consistent description of processes across the scales. We present an application of this approach to tumor growth.

<sup>1</sup>This is joint work with Arnaud Chauviere, Haralampos Hatzikirou, and Vittorio Cristini.

John Lowengrub  
UC Irvine

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