

Abstract Submitted  
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**Distinguishing Pattern Formation Phenotypes: Applying Minkowski Functionals to Cell Biology Systems**<sup>1</sup> ERIN RERICHA, CAN GUVEN, University of Maryland, College Park, CAROLE PARENT, National Cancer Institute, National Institutes of Health, WOLFGANG LOSERT, University of Maryland, College Park — Spatial Clustering of proteins within cells or cells themselves frequently occur in cell biology systems. However quantifying the underlying order and determining the regulators of these cluster patterns have proved difficult due to the inherent high noise levels in the systems. For instance the patterns formed by wild type and cyclic-AMP regulatory mutant *Dictyostelium* cells are visually distinctive, yet the large error bars in measurements of the fractal number, area, Euler number, eccentricity, and wavelength making it difficult to quantitatively distinguish between the patterns. We apply a spatial analysis technique based on Minkowski functionals and develop metrics which clearly separate wild type and mutant cell lines into distinct categories. Having such a metric facilitated the development of a computational model for cellular aggregation and its regulators.

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