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Flor A Espinoza and **Stanly Steinberg L Steinberg*** (stanly@math.unm.edu), Department of Mathematics and Statistics, University of New Mexico, Albuquerque, NM 87131. *Understanding the Dynamics of Membrane Proteins.*

In this study, we show that an innovative time series analysis of single particle tracking data for the high affinity IgE receptor, FcεRI, on mast cells provides substantial quantitative information about the submicrometer organization of the membrane. The analysis focuses on the probability distribution function of the lengths of the jumps in the positions of the quantum dots labeling individual IgE FcεRI complexes between frames in movies of their motion. Our results demonstrate the presence, within the micrometer-scale cytoskeletal corrals, of smaller subdomains that provide an additional level of receptor confinement. There is no characteristic size for these subdomains; their size varies smoothly from a few tens of nanometers to a over a hundred nanometers. The probability distribution of the jump lengths is well fit, from 10nm to over 100nm, by a novel power law. The fit for short jumps suggests that the motion of the quantum dots can be modeled as diffusion in a fractal space of dimension less than two. (Received February 11, 2013)