

Abstract Submitted
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The Plasma Membrane is Compartmentalized by a Self-Similar Cortical Actin Fractal SANAZ SADEGH, JENNY HIGGIN, PATRICK MANNION, MICHAEL TAMKUN, DIEGO KRAPF, Colorado State University — A broad range of membrane proteins display anomalous diffusion on the cell surface. Different methods provide evidence for obstructed subdiffusion and diffusion on a fractal space, but the underlying structure inducing anomalous diffusion has never been visualized due to experimental challenges. We addressed this problem by imaging the cortical actin at high resolution while simultaneously tracking individual membrane proteins in live mammalian cells. Our data show that actin introduces barriers leading to compartmentalization of the plasma membrane and that membrane proteins are transiently confined within actin fences. Furthermore, superresolution imaging shows that the cortical actin is organized into a self-similar fractal. These results present a hierarchical nanoscale picture of the plasma membrane and demonstrate direct interactions between the actin cortex and the cell surface.

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