

Tubular clathrin/AP-2 lattices pinch collagen fibers to support 3D cell migration.

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Abstract

Migrating cells often use focal adhesions in order to move. Focal adhesions are less prominent in cells migrating in three-dimensional (3D) as compared with 2D environments. We looked for alternative adhesion structures supporting cell migration. We analyzed the dynamics of clathrin-coated pits in cells migrating in a 3D environment of collagen fibers. Both topological cues and local engagement of integrins triggered the accumulation of clathrin-coated structures on fibers. Clathrin/adaptor protein 2 (AP-2) lattices pinched collagen fibers by adopting a tube-like morphology and regulated adhesion to fibers in an endocytosis-independent manner. During migration, tubular clathrin/AP-2 lattices stabilized cellular protrusions by providing anchoring points to collagen fibers. Thus, tubular clathrin/AP-2 lattices promote cell adhesion that, in coordination with focal adhesions, supports cell migration in 3D.

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