

Assembly Of A Cell Adhesion

As a cell moves, it must not only extend the leading membrane but also establish contacts with the underlying substratum. Both processes involve polymerization of actin filaments but how a cell controls the assembly of two distinct structures is unknown. We have applied quantitative 4D fluorescence microscopy methods to study how a macrophage assembles a cell adhesion. We find two populations of cell adhesions, called podosomes, distinguished by their dynamics, simple podosomes with a 1 minute half-life and branched podosomes with a 7 minute half-life, assemble at the leading edge of a macrophage. Podosome lifetime is prolonged by fusion and fission of podosomes. Most significant is a new finding that podosome fission is a major mechanism for generating large numbers of cell adhesions. A new structure, a large podosome cluster precursor (PCP), enlarges from a simple podosome and then fragments into a cluster of daughter podosomes. This process of podosome fragmentation is analogous to the branching of actin filaments at the leading edge membrane. Because branched podosomes and PCPs are located at the leading edge, they may play a critical role in continually generating new sites of cell adhesion and may involve pathways common with the protrusion of the leading edge membrane.



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Date: Friday, January 17 2003

Time: 4:00 pm

Venue: LT 20

Host: Prof Hew Choy Leong

All are welcome