

# **Rab27a co-ordinates actin-dependent long-range organelle transport by integrating the activity of motors and track assembly proteins**

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Abstract:

Cell biologists generally consider that microtubules and actin play complementary roles in long- and short-distance transport in animal cells. On the contrary, using melanosomes of melanocytes as a model, we recently discovered that motor myosin-Va, works with dynamic actin tracks, to drive long-range transport in microtubule depleted cells. This suggests that in animals, as in yeast and plants, myosin/actin can drive long-range transport. Here we show that the actin assembly activity of spire and formin (Fmn-1) proteins is required for myosin-Va-dependent transport. Moreover we show that, in addition to recruiting myosin-Va, Rab27a recruits spire/Fmn-1 to melanosomes, thereby integrating motor and track assembly activity at the organelle membrane. Based on this we suggest a model in which organelles and force generators (motors and track assemblers) are linked forming a cell-wide network that allows the collective activity of the force generators to rapidly disperse the population of organelles long-distance throughout the cytoplasm.

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**Room PH 127**