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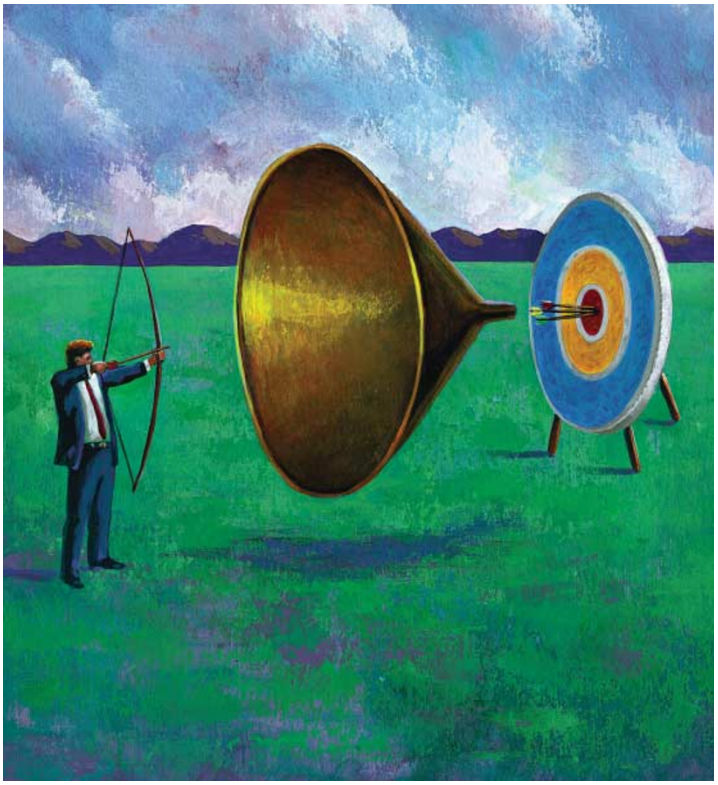
MEMBRANE TRAFFICKING

A new way to target



Myristoylation of the Arf-family GTPases is required for their membrane targeting, so how is the Arl3 (Arf-like-3) GTPase — which lacks a myristoylation site — targeted to membranes? Two papers in *Nature Cell Biology*, from Munro and colleagues and the Burd group, now provide the answer to this question and highlight a new method of membrane recruitment.

In yeast, Arl3 recruits the Arl1 GTPase to the Golgi, and Arl1, in turn, recruits golgins (transport-carrier tethering proteins) such as the yeast golgin Imh1. To further understand this recruitment process, Munro and co-workers looked for proteins that are required for Imh1 targeting, and they found that deleting subunits of the NatC amino-terminal acetylation complex disrupted the Golgi targeting of Arl3, Arl1 and Imh1.

Next, they showed that the acetyltransferase activity of the NatC complex is needed for this Arl3-dependent Golgi targeting, and that Arl3 is acetylated at its amino terminus by this complex. So, how is acetylated Arl3 targeted to the Golgi? Does it have a specific receptor on Golgi membranes?

In the final part of their study, Munro and colleagues showed that the mammalian Golgi-membrane protein SYS1 is required for the Golgi recruitment of the mammalian Arl3 homologue ARFRP1, probably through direct interactions of SYS1 with ARFRP1. Furthermore, they showed that this recruitment is dependent on the unique amino-terminal region of ARFRP1.

In their study, the Burd group also found that Arl3, NatC-complex subunits and Sys1 are needed for the Golgi recruitment of Arl1 and Imh1. More specifically, they showed that the NatC-complex subunits and Sys1 are needed for the function of Arl3. Furthermore, they showed that the amino terminus of Arl3 is crucial for its function and that the amino-terminal residue of Arl3 is acetylated *in vivo*, probably by the NatC complex.

In the concluding part of their study, the Burd group showed that the amino-terminal acetylation of Arl3 is essential for the Sys1-dependent targeting of Arl3 to the Golgi. Their data indicate that this modification promotes the direct interaction of Arl3 with Sys1.

So, together, these two papers have highlighted a new way to target small GTPases to membranes. Furthermore, they have identified a new biological role for amino-terminal acetylation.

Rachel Smallridge

References and links

ORIGINAL RESEARCH PAPERS Behnia, R. *et al.* Targeting to the Golgi of the Arf-like GTPase Arl3p requires N-terminal acetylation and the membrane protein Sys1p. *Nature Cell Biol.* 11 April 2004 (doi:10.1038/ncb1120) | Setty, S. R. *et al.* Golgi targeting of ARF-like GTPase Arl3p requires its N^{α}-acetylation and the integral membrane protein Sys1p. *Nature Cell Biol.* 11 April 2004 (doi:10.1038/ncb1121)

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