Microtubule binding of the Drosophila DMAP-85 protein is regulated by phosphorylation in vitro

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The phosphorylation of microtubule-associated proteins (MAPs) is thought to be a key factor in the regulation of microtubule (MT) stability. Previously we isolated DMAP-85, a Drosophila MAP shown to be associated with stable MTs. In this work we show that DMAP-85 phosphorylated in cell-free early embryo extracts is released from MTs. MPM-2 antibodies recognize the phosphorylated protein. In vitro, DMAP-85 can be phosphorylated by the mitotic kinase Polo affecting its binding to MTs and creating MPM-2 epitopes on the protein. The results suggest that phosphorylation of DMAP-85 might affect its MT stabilizing activity during early mitotic cycles.