ARP-T1-associated Bazex-Dupré-Christol Syndrome is an inherited basal cell cancer with ciliary defects characteristic of ciliopathies

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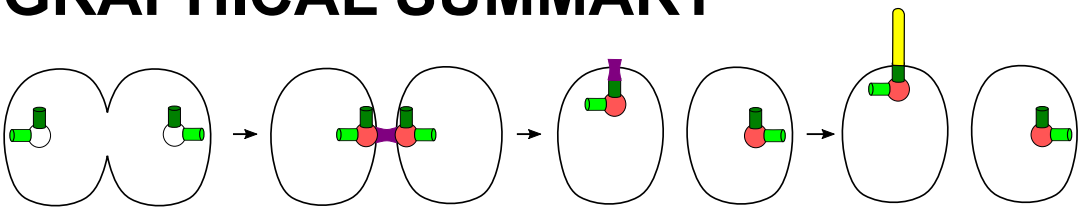
ABSTRACT

Actin-Related Protein -Testis1 (ARP -T1)/ACTRT1 gene mutations cause the Bazex-Dupré-Christol Syndrome (BDCS) characterized by follicular atrophoderma, hypotrichosis and basal cell cancer. Here, we report an ARP-T1 interactome (PXD016557) that includes proteins involved in ciliogenesis, endosomal recycling and septin ring formation. In agreement, ARP-T1 localizes to the midbody during cytokinesis and the basal body of primary cilia in interphase. Tissue samples from ARP-T1-associated BDCS patients have reduced ciliary length. The severity of the shortened cilia significantly correlates with the ARP-T1 levels, which was further validated by ACTRT1 knockdown in culture cells. Thus, we propose that ARP-T1 participates in the regulation of cilia length and that ARP-T1-associated BDCS is a case of a skin cancer with ciliopathy characteristics.

GRAPHICAL SUMMARY



Mother centriole ARP-T1 Primary cilium

Daughter centriole Midbody components

We deciphered the role of ARP-T1 in keratinocytes and epithelial cells. We found that ARP-T1 localizing to the basal body of primary cilium, supports intact cilia and controls proper ciliogenesis, potentially through septin 2 involvement.

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