**Titel:** The role of the retinal degeneration protein 3 (RD3) in neuroblastoma cancer

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**Zusammenfassung des Projekts**

Retinal degeneration protein 3 (RD3) acts as an allosteric modulator of photoreceptor guanylate cyclase (GC-E) activity and is involved in cyclase trafficking from the endoplasmic reticulum to endosomal vesicles. Very recently, we described a new function of RD3 by showing that purified RD3 activates guanylate kinase (GUK) in photoreceptor cells (Wimberg et al., 2018). Recent studies revealed further that RD3 is more ubiquitously expressed in different mouse and human tissues including brain, kidney, liver and spleen. Based on the ubiquitous expression of GUK and the constitutive expression of RD3 in brain and other tissues we propose that RD3 is involved in the regulation of the nucleotide cycle in cells outside of the retina, which might have implications for tumorigenesis. We will analyze expression profiles of RD3 and GUK in different brain regions, look for co-localization and perform enzymatic assays with native tissue. Furthermore, we will try to identify the role of RD3 under pathophysiological conditions. In detail, we will identify the function of RD3 in tumor growth and progression. Therefore, we will analyse the protein interaction partners, RD3 involvement in different signaling pathways, and protein - lipid interaction during tumor development and growth. With these results we hope to get a better understanding of tumor development.

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