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RESEARCH AREA

I am a postdoctoral researcher in the Cytoskeletal Dynamics research group. One of the main research interests of our group is elucidating the role of actin-binding proteins that regulate the formation and organization of sarcomeric actin filaments. During my PhD, I started working with a *Drosophila*-specific, structurally disordered sarcomere regulatory protein (Sarcomere length short, SALS) containing the WH2 domain. Interestingly, although there is no genetic link between it and *human* Leiomodin, our results suggest they are functional homologues. It is known that dysfunction of Leiomodin leads to Nemaline Myopathy. I aim to describe the mechanisms underlying the biological functions of SALS to test potential myopathic therapeutic agents or molecular inhibitors in the Drosophila model system in the future.

TECHNIQUES AVAILABLE IN THE LAB

The process of recombinant protein production from expression vector to protein (E. coli bacterial system and from tissue), biophysical and biochemical characterisation of proteins, fluorescent labelling, spectroscopy (UVVIS absorption, fluorescence), light and fluorescence microscopy (total internal reflection, TIRF), gel electrophoresis, Western blot, liquid chromatography (gel filtration and affinity chromatography techniques), sedimentation (preparative centrifugation), bioinformatics tools, image analysis, statistics.

SELECTED PUBLICATIONS

Farkas, D., Szikora, Sz., Jijumon, A.S., Polgár, T.F., Patai, R., **Tóth, M.Á.**, Bugyi, B., Gajdos, T., Bíró, P., Novák, T., Erdélyi, M., Mihály, J. (2024) Peripheral thickening of the sarcomeres and pointed end elongation of the thin filaments are both promoted by SALS and its formin interaction partners. **PLoS Genet 20:** 1011117.

Gaszler, P., Hanifatul, R., Pintér, R., Bukovics, P., Sakenov, R., Huber, T., Vig, A.T., **Tóth, M.Á.**, Bugyi, B. (2021) Structural and Functional Analyses of the Gelsolin Homology Domains of Flightless-I in Actin Dynamics. **FASEB J 35:** 00391.

Pintér, R., Huber, T., Bukovics, P., Gaszler, P., Vig, A.T., **Tóth, M.Á.**, Gazsó-Gerhát, G., Farkas, D., Migh, E., Mihály, J., Bugyi, B. (2020) The Activities of the Gelsolin Homology Domains of Flightless-I in Actin Dynamics. **Front Mol Biosci 7:** 575077.

Vig, T.A., Földi, I., Szikora, Sz., Migh, E., Gombos, R., **Tóth, M.Á.**, Huber, T., Pintér, R., Talián, G.Cs., Mihály, J., Bugyi, B. (2017) The activities of the C-terminal regions of the formin protein disheveled-associated activator of morphogenesis (DAAM) in actin dynamics. **J Biol Chem 292:** 13566-13583.

Tóth, M.Á., Majoros, A.K., Vig, A.T., Migh, E., Nyitrai, M., Mihály, J., Bugyi, B. (2016) Biochemical Activities of the Wiskott-Aldrich Syndrome Homology Region 2 Domains of Sarcomere Length Short (SALS) Protein. **J Biol Chem 291:** 667-80.