BEATRIX DIENES

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RESEARCH AREA

My research focuses mainly on skeletal muscle function and the molecular processes underlying altered muscle performance. Electrophysiological measurements, the optical detection of intracellular calcium concentration changes under physiological and pathological conditions, and the study of changes in calcium homeostasis are all aimed at understanding these processes. A recently recognized component of skeletal muscle function is the store-operated calcium entry process (SOCE). We investigate the role of SOCE in the development of various pathological conditions and in the onset of symptoms. We also seek to understand the contribution of the mitochondrion to the development of reduced muscle performance and certain pathological conditions and the associated calcium homeostasis modification. My recent research interests include the role of cytoskeletal proteins, specifically septin7, in skeletal muscle function. A new but important direction is the study of the role of the mechanosensitive Piezo1 channel in different muscle types (smooth muscle, skeletal muscle).

TECHNIQUES AVAILABLE IN THE LAB

Experiments in the working group include basic cell biology and molecular biology techniques (cell culture, immunofluorescence labelling, Western blot, DNA and RNA isolation, PCR, transfection), electrophysiological methods (patch-clamp), confocal laser scanning and STED microscopy, cellular experiments under microgravity conditions and experiments on mouse models.

SELECTED PUBLICATIONS

Sztretye, M., Geyer, N., Vincze, J., Al-Gaadi, D., Oláh, T., Szentesi, P., Kis, G., Antal, M., Balatoni, I., Csernoch, L., **Dienes, B.** (2017) SOCE Is Important for Maintaining Sarcoplasmic Calcium Content and Release in Skeletal Muscle Fibers. **Biophys J 113:** 2496-2507.

Gönczi, M., Ráduly, Z., Szabó, L., Fodor, J., Telek, A., Dobrosi, N., Balogh, N., Szentesi, P., Kis, G., Antal, M., Trencsényi, G., **Dienes, B.**, Csernoch, L. (2022) Septin7 is indispensable for proper skeletal muscle architecture and function. **eLife 11:** e75863.

Dienes, B., Bazsó, T., Szabó, L., Csernoch, L. (2023) The Role of the Piezo1 Mechanosensitive Channel in the Musculoskeletal System. **Int J Mol Sci 24 (7):** 6513.

Szabó, L., Telek, A., Fodor, J., Dobrosi, N., Dócs, K., Hegyi, Z., Gönczi, M., Csernoch, L., **Dienes, B.** (2023) Reduced Expression of Septin7 Hinders Skeletal Muscle Regeneration. **Int J Mol Sci 24 (17):** 13536.

Szabó, L., Balogh, N., Tóth, A., Angyal, Á., Gönczi, M., Csiki, D., Tóth, C., Balatoni, I., Jeney, V., Csernoch, L., **Dienes, B.** (2022) The mechanosensitive Piezo1 channels contribute to the arterial medial calcification. **Front Physiol 10(13):** 1037230.