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RESEARCH AREA

Post-translational modifications, such as conjugation of proteins to phosphate and methyl groups, lipids and ubiquitin, have a major impact on the biological function of proteins. For this reason, inhibiting and activating the enzymes catalyzing these modifications, other factors regulating their expression and selectively targeting these modifications may be a therapeutic strategy for a number of diseases. Our work focuses on the pathological shift in post-translational modification patterns in reproductive diseases, insulin resistance, hyperthyroidism and tumorigenesis and the pathobiochemical processes applying biochemical, molecular biological and proteomic methods. Our work will primarily focus on the Mg2+ -dependent protein phosphatase/myosin phosphatase/ protein arginine methyltransferase 5 oncogenic signaling pathway that induces lung tumor formation as a diagnostic and therapeutic target.

TECHNIQUES AVAILABLE IN THE LAB

Immunohistochemistry, immunofluorescence, High Content Screening analysis, cell migration assay, cell viability assay, Western blot analysis, immunoprecipitation, pull down essay, micro array analysis, RNA and DNA preparation, Q-PCR, protein purification methods, glucose uptake assay, protein phosphatase activity measurement assay.

SELECTED PUBLICATIONS

Major, E., Győry, F., Horváth, D., Keller, I., Tamás, I., Uray, K., Fülöp, P., **Lontay, B.** (2021) Smoothelin-Like Protein 1 Regulates Development and Metabolic Transformation of Skeletal Muscle in Hyperthyroidism. **Front Endocrinol 12:** 751488.

Major, E., Keller, I., Horváth, D., Tamás, I., Erdődi, F., **Lontay, B.** (2021) Smoothelin-Like Protein 1 Regulates the Thyroid Hormone-Induced Homeostasis and Remodeling of C2C12 Cells via the Modulation of Myosin Phosphatase. **Int J Mol Sci 19:** 10293.

Uray, K., Major, E., **Lontay, B.** (2020). MicroRNA Regulatory Pathways in the Control of the Actin-Myosin Cytoskeleton. **Cells 7:** 1649.

Horváth, D., Sipos, A., Major, E., Kónya, Z., Bátori, R., Dedinszki, D., Szöllősi, A., Tamás, I., Iván, J., Kiss, A., Erdődi, F., **Lontay, B.** (2018) Myosin phosphatase accelerates cutaneous wound healing by regulating migration and differentiation of epidermal keratinocytes via Akt signaling pathway in human and murine skin. **Biochim Biophys Acta Mol Basis 10:** 3268-3280.

Sipos, A., Iván, J., Bécsi, B., Darula, Z., Tamás, I., Horváth, D., Medzihradszky, K.,F., Erdődi, F., **Lontay, B.** (2017). Myosin phosphatase and RhoA-activated kinase modulate arginine methylation by the regulation of protein arginine methyltransferase 5 in hepatocellular carcinoma cells. **Sci Rep 7:** 40590.