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RESEARCH AREA

Primarily, we aim to identify the unique molecular regulators of browning in human adipose-derived stromal cells and differentiated adipocytes obtained from adipose tissues of distinct anatomical origins by analyzing the global gene expression pattern of these cells. To prove that the identified molecular elements directly regulate brown/beige differentiation or activation, the specific genes will be deleted or overexpressed. Based on the obtained gene expression data, we wish to determine the secreted cytokine and metabolite profiles of distinct human thermogenic adipose tissues and adipocytes by system biology approaches. We also intend to systematically investigate how human browning adipocytes switch off their thermogenic capacity and become dormant in response to the withdrawal of browning-inducers. Our research might open up better strategies for specific stimulation of beneficial fat browning or preventing entry into dormancy in humans, which aid weight reduction and decrease insulin resistance in obese individuals.

TECHNIQUES AVAILABLE IN THE LAB

Isolation of nucleic acids, reverse transcription coupled quantitative polymerase chain reaction, single nucleotide polymorphism genotyping, functional genomics analysis of RNA-sequencing data, protein purification, immunoblotting, cultivation of cells, ELISA, functional cellular metabolic analysis (Seahorse XF96 extracellular flux assay), immunocytochemistry, laser-scanning cytometry.

SELECTED PUBLICATIONS

Kristóf, E., Doan-Xuan, Q.M., Bai, P., Bacso, Z., Fésüs, L. (2015) Laser-scanning cytometry can quantify human adipocyte browning and proves effectiveness of irisin. **Scientific Reports 5:** 12540.

Kristóf, E., Doan-Xuan, Q.M., Sárvári, A.K., Klusóczki, Á., Fischer-Posovszky, P., Wabitsch, M., Bacso, Z., Bai, P., Balajthy, Z., Fésüs L. (2016) Clozapine modifies the differentiation program of human adipocytes inducing browning. **Translational Psychiatry 6:** e963.

Klusóczki, Á., Veréb, Z., Vámos, A., Fischer-Posovszky, P., Wabitsch, M., Bacso, Z., Fésüs, L., **Kristóf E.** (2019) Differentiating SGBS adipocytes respond to PPARγ stimulation, irisin and BMP7 by functional browning and beige characteristics. **Scientific Reports 9:** 5823.

Tóth, B.B., Arianti, R., Shaw, A., Vámos, A., Veréb, Z., Póliska, S., Győry, F., Bacso, Z., Fésüs, L., **Kristóf, E.** (2020) FTO intronic SNP strongly influences human neck adipocyte browning determined by tissue and PPARγ specific regulation: a transcriptome analysis. **Cells 9:** 987.

Shaw, A., Tóth, B.B., Király, R., Arianti, R., Csomós, I., Póliska, S., Vámos, A., Korponay-Szabó, I.R., Bacso, Z., Győry, F., Fésüs, L., **Kristóf, E.** (2021) Irisin stimulates the release of CXCL1 from differentiating human subcutaneous and deep-neck derived adipocytes via upregulation of NFκB pathway. **Frontiers in Cell and Developmental Biology 9:** 737872.

Vámos, A., Shaw, A., Varga, K., Csomós, I., Mocsár, G., Balajthy, Z., Lányi, C., Bacso, Z., Szatmári-Tóth, M., **Kristóf, E.** (2022) Mitophagy mediates the beige to white transition of human primary subcutaneous adipocytes ex vivo. **Pharmaceuticals (Basel) 15:** 363.