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RESEARCH AREA

Diastolic dysfunction and left ventricular hypertrophy are characteristic features of chronic heart failure in the early phases. With the progression of cardiac fibrosis, systolic dysfunction also develops leading to the late phases of chronic heart failure. Common causes of chronic heart failure are arterial hypertension, chronic kidney disease (CKD), metabolic syndrome, oncologic treatments such as chemotherapy and/or radiotherapy-induced cardiotoxicity forms. Our aim is to investigate and compare the molecular mechanisms of heart failure forms developed as a consequence of different underlying diseases. The identification of the early predictors and prevention of hypertrophy and fibrosis by the administration of protective agents are relevant research perspectives both experimentally and clinically. In our experiments, we investigate the heart function and morphology, the molecular changes in the cardiac microRNA/mRNA profiles and downstream targets as well as the circulating marker molecules, and we test new agents for the prevention of heart failure.

TECHNIQUES AVAILABLE IN THE LAB

Induction and treatment of disease models (e.g. chronic kidney disease induced by 5/6 nephrectomy, metabolic syndrome, radiation-induced heart disease, chemotherapy-induced cardiotoxicity, etc.) in experimental animals (rats and mice), assessment of cardiac function and morphology by transthoracic echocardiography, drug administration via different routes (per os gavage, ip., iv.), blood sampling, oral glucose tolerance test, histological analysis, general biochemical and molecular biology methods (colorimetric assays, qRT-PCR, ELISA, Western blot) to determine metabolites, microRNA, mRNA, proteins and enzyme activities, etc.

SELECTED PUBLICATIONS

Sárközy, M., Watzinger, S., Kovács, Z., Acar, E., Márványkövi, F., Szűcs, G., Lauber, G., Siska, A., Galla, Z., Földesi, I., Fintha, A., Kriston, A., Kovacs, F., Horváth, P., Kővári, B., Cserni, G., Krenács, T., Szabó, P., Szabó, G., Monostori, P., Zins, K., Abraham, D., Csont, T., Pokreisz, P., Podesser, BK., Kiss, A. (2023) Neuregulin-1β improves uremic cardiomyopathy and renal dysfunction in rats. **J Am Coll Cardiol Basic Trans Science**.

Kovács, M.G., Kovács, Z.Z.A., Varga, Z., Szűcs, G., Freiwan, M., Farkas, K., Kővári, B., Cserni, G., Kriston, A., Kovács, F., Horváth, P., Földesi, I., Csont, T., Kahán, Z., **Sárközy, M.** (2021) Investigation of the Antihypertrophic and Antifibrotic Effects of Losartan in a Rat Model of Radiation-Induced Heart Disease. **Int J Mol Sci 22:** 12963.

Kovács, Z.Z.A., Szűcs, G., Freiwan, M., Kovács, M.G., Márványkövi, F.M., Dinh, H., Siska, A., Farkas, K., Kovács, F., Kriston, A., Horváth, P., Kővári, B., Cserni, B.G., Cserni, G., Földesi, I., Csont, T., **Sárközy, M.** (2021) Comparison of the antiremodeling effects of losartan and mirabegron in a rat model of uremic cardiomyopathy. **Sci Rep 11:** 17495.

Sárközy, M., Márványkövi, F.M., Szűcs, G., Kovács, Z.Z.A., Szabó, M.R., Gáspár, R., Siska, A., Kővári, B., Cserni, G., Földesi, I., Csont, T. (2021) Ischemic preconditioning protects the heart against ischemia-reperfusion injury in chronic kidney disease in both males and females. **Biol Sex Differ 12:** 49.

Sárközy, M., Gáspár, R., Zvara, Á., Siska, A., Kővári, B., Szűcs, G., Márványkövi, F., Kovács, M.G., Diószegi, P., Bodai, L., Zsindely, N., Pipicz, M., Gömöri, K., Kiss, K., Bencsik, P., Cserni, G., Puskás, L.G., Földesi, I., Thum, T., Bátkai, S., Csont, T. (2019) Chronic kidney disease induces left ventricular overexpression of the pro-hypertrophic microRNA-212. **Sci Rep 9:** 1302.