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RESEARCH AREA

The prevalence of rheumatoid arthritis, which is an autoimmune disease and sometimes causes serious joint deformity and loss of function, is estimated to be around 0.5-1%. Despite of the fact that we can use more and more drugs in therapy, remission can not be reached for many patients, so it is important to identify new drug targets, which necessitates a better understanding of the pathogenesis. Many cell types are involved in the development of rheumatoid arthritis: in addition to resident cells in the synovium (e.g. synovial fibroblasts), cells of both the adaptive and the innate immune system (e.g. neutrophils and macrophages) are key players. The aim of the Translational Rheumatology Research Group is to study the signaling pathways of synovial fibroblasts, macrophages and neutrophils in the development and progression of autoimmune arthritis, and to inhibit the function of the identified molecules, which can contribute to the development of new therapies.

TECHNIQUES AVAILABLE IN THE LAB

In vitro methods: culturing mouse and human synovial fibroblasts and macrophages, isolation of neutrophils; cell activation and detection of various cell responses (e.g. by spectrophotometry, ELISA, qPCR, microscope or flow cytometry). In vivo experiments: induction of experimental arthritis by active or passive immunization, assessment of joint inflammation, detection of in vivo cell recruitment and cytokine levels, histology. Transgenic and pharmacological approaches are used to investigate signaling pathways.

SELECTED PUBLICATIONS

Káposztás, E., Balogh, L., Mócsai, A., Kemecsei, É., Jakus, Z. and **Németh, T.** (2023) The selective inhibition of the Syk tyrosine kinase ameliorates experimental autoimmune arthritis. **Front Immunol 14:** 1279155.

Németh, T., Balogh, L., Káposztás, E., Szilveszter, K.P. and Mócsai, A. (2023) Neutrophil-specific Syk expression is crucial for skin disease in experimental epidermolysis bullosa acquisita. **J Invest Dermatol 143(7)**: 1147-1156.

Németh, T., Nagy, G. and Pap, T. (2022) Synovial fibroblasts as potential drug targets in rheumatoid arthritis, where do we stand and where shall we go? **Ann Rheum Dis 81(8):** 1055-1064.

Németh, T., Sperandio, M. and Mócsai, A. (2020) Neutrophils as emerging therapeutic targets. **Nat Rev Drug Discov 19:** 253-275.

Németh, T., Futosi, K., Sitaru, C., Ruland, J. and Mócsai A. (2016) Neutrophil-specific deletion of the CARD9 gene expression regulator suppresses autoantibody-induced inflammation in vivo. **Nat Commun 7:** 11004.