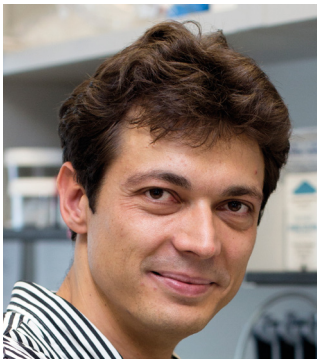
BALÁZS ENYEDI



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RESEARCH AREA

Tissue injury triggers rapid defense mechanisms against potential intruding pathogens to protect the body from the outside world within minutes. In the course of the triggered inflammatory process, chemoattractants guide leukocytes to the site of damage to serve in host defense and promote long term healing and regeneration. Our research focuses on investigating the early stages of the inflammatory processes by using molecular and cell biological tools along with transgenic zebrafish as a model system. Our main goal is to understand how cells of the damaged tissue communicate with leukocytes to trigger and regulate inflammation. To achieve this, we develop genetically encoded fluorescent biosensors using advanced molecular and genetic engineering tools. We test and optimize these tools in cell culture experiments and subsequently create transgenic zebrafish lines expressing the novel biosensors. This allows us to visualize and measure the cellular and molecular mechanisms of the inflammatory process initiated by tissue damage through confocal microscopy.

TECHNIQUES AVAILABLE IN THE LAB

Molecular biology: cloning, mutagenesis, gene library construction, gene silencing and knockout techniques. Cell culture-based experiments: creating stable cell lines, developing tools for biotechnology, flow cytometry, and high-throughput imaging. Using zebrafish as a model system: microinjecting oocytes, generating transgenic and knockout lines, live imaging. Microscopy and image analysis: light microscopy, fluorescence, and confocal microscopy, using optogenetic tools, and Python-based data processing.

SELECTED PUBLICATIONS

Tamás, SX., Roux, BT., Vámosi, B., Dehne, FG., Török, A., Fazekas, L., **Enyedi, B.** (2023) A genetically encoded sensor for visualizing leukotriene B4 gradients in vivo. **Nat Commun.** 2023 Aug 1;14(1):4610. IF: 17.694

Enyedi, B., Niethammer, P. (2015) Mechanisms of epithelial wound detection. **Trends Cell Biol.** 2015 Jul;25(7):398-407. IF: 11.532

Enyedi, B., Jelcic, M., Niethammer, P. (2016) The cell nucleus serves as a mechanotransducer of tissue damage - induced inflammation. **Cell.** 2016 May 19;165(5):1160-70 IF: 30.41

Gault, WJ., **Enyedi, B.**, Niethammer, P. (2014) Osmotic surveillance mediates rapid wound closure through nucleotide release. **J. Cell Biol.** 2014 Dec 22;207(6):767-82. IF: 9.834

Enyedi, B., Kala, S., Nikolich-Zugich, T., Niethammer, P. (2013) Tissue damage detection by osmotic surveillance. **Nat Cell Biol.** 2013 Sep;15(9):1123–1130. IF: 20.058