

tRNA fragments are involved in poststroke immune reactions

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Sebastian Lobentanzer of Goethe University, Frankfurt, has been studying small RNA dynamics in various contexts using bioinformatic methods. Recently, small RNAs have become more and more interesting for researchers, primarily because of their extensive regulatory functions. To examine these functions in stroke, Lobentanzer joined Katarzyna Winek of Hebrew University, Jerusalem, to study microRNAs and tRNA fragments in blood samples from ischemic stroke patients collected at Charité, Berlin. "tRNA fragments, which until now were only thought to be debris of the amino acid-transporting tRNAs, have recently been shown to possess biological functions; naturally, we were very interested in that," explains the pharmacologist.

The project was initiated and led by Hermona Soreq (Hebrew University, Jerusalem, Israel) and Andreas Meisel (Charité, Berlin), who jointly study the contributions of small RNA regulators of cholinergic signaling in blood cells of stroke patients, funded by the Einstein Foundation. Katarzyna Winek from The Edmond and Lily Safra Center of Brain Science at The Hebrew University collaborated with Sebastian Lobentanzer at the Institute for Pharmacology and Clinical Pharmacy (AK Jochen Klein) at Goethe University Frankfurt, Germany.

This [collaborative effort](#) was able to show, for the first time, the involvement of monocytic tRNA fragments in the poststroke immune response. "Simply put, there may be a 'changing of the guards,' in which tRNA fragments replace microRNAs in monocytes," explains Lobentanzer. "Bioinformatic network analyses show that these two small RNA species have vastly different functional roles in the [immune response](#), and thus may work in synergy in the regulation of homeostasis." In the long run, the researchers want to find therapeutics

to modify these processes. Indeed, if the immune status of each patient after a stroke could be individually determined, many complications could be avoided.

More information: Katarzyna Winek et al. Transfer RNA fragments replace microRNA regulators of the cholinergic poststroke immune blockade, *Proceedings of the National Academy of Sciences* (2020). [DOI: 10.1073/pnas.2013542117](https://doi.org/10.1073/pnas.2013542117)

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