

# Nature as a model: Researchers develop novel anti-inflammatory substance

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Anti-inflammatory substances based on components of human cells could one day improve treatment in patients. Researchers at the Institute of Pharmacy at Martin Luther University Halle-Wittenberg (MLU) have developed a method for producing those substances with controlled quality. Since the body does not recognize them as foreign substances, they offer advantages over anti-inflammatory drugs such as ibuprofen or

diclofenac. The results were published in the *European Journal of Pharmaceutical Sciences*.

"We are attempting to imitate nature," explains Professor Karsten Mäder from the Institute of Pharmacy at MLU. These novel anti-inflammatory substances occur naturally within the [human body](#), for example on the inner surface of [cells](#). When a cell dies, it turns inside out, or more precisely, phosphatidylserine (PS), a certain component of its cell membrane does. This gives phagocytes the signal to digest the dead cell. PS also ensures that there is no inflammatory response. Something similar happens in the lungs, which are regularly confronted with a large number of foreign substances after an intake of breath. Here another phospholipid, phosphatidylglycerol (PG), ensures that there is no excessive inflammatory response. Mäder's research group has now prepared both substances so that they can potentially be used as drugs—possible areas of application include infarcts, arthritis and psoriasis.

From a medical standpoint, both phospholipids are of interest to researchers because the body does not recognize them as foreign substances, which means fewer side effects can be expected. A U.S. study has already shown that PS is particularly effective in fighting inflammation after a heart attack. "However, producing the preparation was a complex process," says Mäder. The research group from Halle has now developed a production process that is much simpler and cheaper. The phospholipids form [small particles](#) that are less than ten nanometres in size. This enables them to easily undergo sterile filtration. They have also proven to be harmless to cells and blood components. Especially the PG particles produced in this way were shown to reduce the inflammatory activity of phagocytes under laboratory conditions. "The results indicate that the phospholipids could work well in anti-inflammatory therapies," says Mäder summarizing the research work.

However, several [clinical trials](#) are needed before the natural anti-inflammatory [substances](#) can be used in humans. The research was supported by the Phospholipid Research Center in Heidelberg.

**More information:** Miriam Elisabeth Klein et al, Phosphatidylserine (PS) and phosphatidylglycerol (PG) enriched mixed micelles (MM): A new nano-drug delivery system with anti-inflammatory potential?, *European Journal of Pharmaceutical Sciences* (2020). [DOI: 10.1016/j.ejps.2020.105451](#)

Provided by Martin-Luther-Universität Halle-Wittenberg

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