The aim of the study was to evaluate the analgesic and anti-inflammatory activity of 12 new HC-030031 analogues - a selective antagonist of the TRPA1 ion channel, which plays an important role in pain, inflammation and neuropathic pain.

Pharmacological studies included the determination of the influence of the tested compounds on the TRPA1 ion channel and the determination of the analgesic and anti-inflammatory activity in the "writhing" test, in the "formalin" test, in the carrageenan edema model. Moreover, for the most active analogs of HC-030031, their analgesic activity in the neuropathic pain model, the effect on the level of cytokines and antioxidant activity were determined.

Initial pharmacological studies led to the selection of new HC-030031 derivatives, showing a strong analgesic and anti-inflammatory effect. The most active structures are xanthine derivatives with amide (**GR-858**, **GR-870**, **MS-131**) or hydrazide (**MS-124**, **GRKA-12**) groups and one benzimidazole derivative with an amide group (**MS-134**). The antinociceptive and anti-inflammatory activity of most of the tested compounds may result from the antagonistic properties of the TRPA1 ion channel, while the rest (having no affinity for the ion channel) - from the inhibition of the COX-1 enzyme. Presumably, these compounds can also inhibit the activity of PDE4 / 7 phosphodiesterase, but the confirmation of this hypothesis requires further studies.