Research project objectives: Most common complication of P2Y12 inhibitors treatment, particularly with ticagrelor, is dyspnea. Pathogenesis of the P2Y12 inhibitors-induced dyspnea is unknown; however, recently published case reports suggests activation of chemosensory areas. The primary objective of this study is to assess the influence of most commonly used in clinical practice P2Y12 inhibitors – ticagrelor and clopidogrel – on central and peripheral chemosensitivities. The secondary objective of the study is to define the relationship between baseline chemosensitivity (assessed before the drug initiation) and the occurrence of dyspnea after its administration.

Methodology: Patients undergoing percutaneous coronary angioplasty (PCI), who according to current European Cardiac Society Guidelines are prescribed with various P2Y12 inhibitors, will be enrolled to the study. Patients will be assigned to 2 groups depending on the type of P2Y12 inhibitor prescribed: Group A – patients receiving ticagrelor, Group B – patients receiving clopidogrel. In both groups chemosensitivity assessment will be performed before P2Y12 inhibitor administration and 3-5 after the drug initiation. Before the second chemosensitivity assessment patients will be additionally asked to fill the questionnaire regarding dyspnea sensation (VAS scale and investigator-designed questionnaire).

Expected impact of the research project on the development of science: Peripheral and central chemoreceptors' oversensitivity, apart from causing dyspnea, has been recently defined as one of the pathogenetic factors leading to sleep-disordered breathing, hypertension and in patients with heart failure as a predictor of poor prognosis. Thus long-term use of P2Y12 inhibitors, especially ticagrelor, if it really influences on chemosensitivity, may lead to the development of diseases caused by chronic activation of chemoreceptors. The dyspnea itself, as it has been shown in PLATO and PEGASUS trials, may lead to ticagrelor withdrawal. Worth noticing is that uncontrolled self-discontinuation of P2Y12 inhibitors by patients after PCI significantly increases the risk of stent thrombosis. Revealing the pathomechanism of P2Y12 inhibitors-related dyspnea will allow to develop treatment strategies to alleviate this complication. Conformation of the studied hypotheses would also justify screening of the patients prior to the drug initiation, what will help to define patients with high risk of development of dyspnea. From the other hand, performing such a test in patients with dyspnea already taking P2Y12 inhibitors may help to find its cause and avoid complicated differentiation diagnostics. Proving the differences in an influence of various P2Y12 inhibitors (ticagrelor vs. clopidogrel) on measured parameters, may allow for better individualization of the therapy, to avoid the occurrence of dyspnea by prescribing the drug with lower chemosensitivity-increasing potential in patients with elevated baseline chemosensitivity.