**POPULARNONAUKOWY OPIS PROJEKTU**

The aim of the experiment is investigation of the influence of inflammation caused by the administration of popular drugs from the group of non-steroidal anti-inflammatory drugs (NSAIDs) for the expression of biologically active substances in neurons of the enteric nervous system (ENS) within the gastrointestinal tract. On the grounds of the high similarity, it is considered that the domestic pig is the best applied research model used in studies on the physiology and pathology of the human digestive system.

The experiment was carried out on 16 gilts (duroc x pietrain) with a body weight of about 20 kg. The animals were divided into four study groups of four animals each: control group (n = 4) animals received empty gelatine capsules, per os for a period of 28 days; experimental group 1 (n = 4) animals received acetylsalicylic acid (100 mg / kg) per os for 28 days; experimental group 2 (n = 4) animals received naproxen at a dose of 50 mg / kg for 28 days; experimental group 3 (n = 4) animals were treated with indomethacin (10 mg / kg) for 28 days. In the next stage of the experiment, euthanasia was performed and tissues (3 cm fragments of selected fragments of the stomach and intestines) were collected for further analysis. In the next stage of the research, freezing preparations will be subjected to double immunofluorescence staining to determine neuronal phenotypes within myenteric and submucosal plexuses as well as density of immunoreactive nerve fibers for the investigated neuroactive substances -VIP (vasoactive intestinal peptide), SP (substance P), nNOS (neuronal nitric oxide synthase), GAL (galanin), PACAP (pituitary adenylate cyclase-activating polypeptide) and CART (cocaine and amphetamine regulated transcript). Antibody against PGP 9.5 (protein gene product 9.5) will be used to determine the total number of nerve cells in the ganglia of the enteric nervous system. Analysis of the stained preparations will be performed using an Olympus BX51 fluorescence microscope. Changing the filters during the observation of the preparations will allow to determine the amount of substances tested in ENS. The percentage of immunoreactive neurons is determined by counting the cells that co-localize with respect to neuroactive substance relative to the total number of neurons of the population.

NSAIDs are commonly used analgesics, anti-inflammatory and antipyretic agents. Quite often, there are visible side effects of their use, which mainly concern the gastrointestinal tract. In the most of the patients, after a single oral dose of classic NSAIDs, endoscopic erosions are observed. In 10-30% of chronically treated people, gastric ulcer disease is observed. The risk of developing ulcer complications (perforations, bleedings) in a single patient is low, however, given the huge number of people using substances from the NSAID group, it can be concluded that the side effects of NSAIDs are a common threat. Deaths due to gastroenterological complications after using NSAIDs are on the 15th place in the USA.

The analysis of the results of the experiment will allow to deepen the knowledge about the influence of inflammation on the phenotype of the ENS neurons, as well as about the understanding of the pathophysiological mechanisms of side effects associated with analgesic therapy in patients using NSAIDs. The enteric nervous system is involved in most physiological and pathological processes occurring in the gastrointestinal tract. ENS is responsible for regulation of gastrointestinal motility, secretion and blood flow within the innervated organs. Its role in the development of drug-induced inflammation in the stomach and intestines is unquestionable, and determining changes in the chemical coding of ENS neuroactive substances will be helpful in determining their contribution to the response to the inflammatory factor. This knowledge can be used in further research aimed at reducing or eliminating the negative effects of taking NSAIDs.