Brief information about the project

Name of the project	AP14870934 «Study of genetic, immune and mucosal predictors of chronic obstructive pulmonary disease, development and implementation of new methods for its diagnosis and prevention»
Relevance	Chronic obstructive pulmonary disease (COPD) is a slowly progressive respiratory disease characterized by chronic inflammation of the airways that occurs in response to long-term air pollution exposure. In addition to environmental factors, an important role in the development of COPD is assigned to hereditary predisposition based on an unfavorable combination of gene alleles. Extended genetic testing of large populations in the GWAS studies has revealed associations of COPD with genes of high statistical significance, such as the nicotinic cholinergic receptor alpha 3/5 (CHRNA3/5) gene, the iron-sensing element-2 (IREB2) binding protein gene, a gene for a protein that interacts with Hedgehog (HHIP), a gene for a protein containing sequences similar to the 13-member protein family A (FAM13A). However, the functional significance of these genes and their contribution to the development of COPD in individual populations are still unclear and require separate scientific studies. Of scientific and practical interest is the study of the relationship between the surface proteins of the respiratory mucosa (MUC5AC, MUC5B, A1AT) and inflammation, microbial contamination of the bronchi, indicators of respiratory function and other clinical parameters. Thus, the purpose of the proposed scientific research is to study gene polymorphisms, disorders of the immune and mucosal homeostasis of the respiratory tract to identify markers for early diagnosis, primary and secondary prevention of chronic obstructive pulmonary disease. For their implementation, it is planned to examine patients with COPD and persons in the control group, including, in addition to determining general clinical indicators, the study of polymorphic variants of genes, proteins and cells of mucosal immunity, the expression of cytokines by immune cells of the respiratory tract, the identification of which will be carried out using modern molecular genetic, immunological methods and methods of molecular biology. Elucidation of the role of gene polymorphism and mucosal immunity in the etiology and pathogenesis of respiratory diseases is an important area of modern molecular medicine.
Purpose	The study of genetic polymorphism, disorders of immune and mucosal homeostasis of the respiratory tract to identify markers of early diagnosis, primary and secondary prevention of chronic obstructive pulmonary disease, development, and implementation of new methods for diagnosing and preventing the disease.
Objectives	1) To determine the degree of impact of environmental pollutants on patients with COPD (smoking status, occupational factors, indoor air pollution). 2) To study the association of CHRNA3/5, IREB2, HHIP, and FAM13A gene polymorphisms with COPD in the Kazakhstan population. 3) To determine the content of proteins MUC5B, MUC5AC, and A1AT on the surface of the mucous membranes of the respiratory tract.

	4) To study the population profile of bronchoalveolar lavage lymphocytes in COPD patients (CD3+CD4+, CD3+CD8+, CD3-CD56+CD16+, CD3-CD56+CD16-, CD3-CD8+CD16+, CD3-CD19+, CD3-CD20+). 5) To determine the expression of activation markers (CD95+HLA-DR+, CD25+) on bronchoalveolar lavage lymphocytes. 6) To study the expression of cytokines TNF, perforin, IL-1, IL-6, IL-10, IL-12, γINF, and IL-7 in bronchoalveolar lavage lymphocytes of COPD patients. 7) To develop new ways of diagnosing and preventing COPD.
Expected and achieved results	The result of the study will be the development of laboratory methods for identifying various endotypes and phenotypes of COPD, based on which clinical recommendations for the diagnosis and prevention of the disease will be proposed.
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles	Akparova Almira Yuriyevna, Candidate of Medical Sciences. Index H – 3, ORCID: https://orcid.org/0000-0001-5769-5892, Scopus Author ID: 57193500731. Web of Science Researcher ID P-1945-2014.
List of publications with links to them	1.Г.М. Курманова, А.Ж. Жанаев, Д.С. Нигматова, Н. З. Зарубекова, Ә.Ш. Патшахан, Б. М. Абдрахманова, А.Ю. Акпарова. Комплексная клиническая оценка больных ХОБЛ в постковидном периоде // Сборник Международной научно-практической конференции «Life after COVID-19» (21-22 апреля 2023г.). – С. 128. https://www.hsm-conferences.org/ru/post/%D1%81%D0%B1%D0%BE%D1%80%D0%BD%D0%B8%D0%BA-%D0%BF%D1%83%D0%B1%D0%BB%D0%B8%D0%BA%D0%B0%D1%86%D0%B8%D0%B8 2. Акпарова А.Ю., Курманова Г.М., Камельжанова Б.Т., Жанаев А.Ж., Нигматова Д.С. Хроническая обструктивная болезнь легких: иммунопатогенез и иммуномодулирующая терапия // Фармация Казахстана. – 2023. - №5. – С. 6-19. https://pharmkaz.kz/kz/2023/10/30/xronicheskaya-obstruktivnaya-bolezn-legkix-immunopatogenez-i-immunomoduliruyushhaya-terapiya/ 3. Курманова Г. М., Жанаев А. Ж., Нигматова Д.С., Абдрахманова Б. М., Калдыбек А. К., Акпарова А. Ю. Влияние пандемии COVID-19 на клинические характеристики больных хронической обструктивной болезнью легких // Материалы X Международного Конгресса «Инновационные технологии в респираторной медицине» (19-21 октября 2023г.). - С. 11.
Patents	-