

Моя профессиональная
карьера



ISSN

INTERNATIONAL
STANDARD
SERIAL
NUMBER

ISSN

2782-4365

Проверить
номер:



Научно-образовательный электронный журнал

ОБРАЗОВАНИЕ И НАУКА В XXI ВЕКЕ

Выпуск №59-4 (том 1)
(февраль, 2025)



Google
Scholar

Проверить индексацию статьи. Сайт: mpcareer.ru/google



Свидетельство
о регистрации СМИ
№ЭЛ ФС 77-77927
от 19.02.2020 г.



РОСКОМНАДЗОР

Периодичность выпуска: 1 раз в неделю

Сайт: mpcareer.ru/oinv21veke. Почта: obrmppcareer@mail.ru



Международный научно-образовательный
электронный журнал
«ОБРАЗОВАНИЕ И НАУКА В XXI ВЕКЕ»

ISSN 2782-4365

УДК 37

ББК 94

**Международный научно-образовательный электронный журнал
«ОБРАЗОВАНИЕ И НАУКА В XXI ВЕКЕ». Выпуск №59-4 (том 1) (февраль,
2025). Дата выхода в свет: 03.03.2025.**

Сборник содержит научные статьи отечественных и зарубежных авторов по экономическим, техническим, философским, юридическим и другим наукам.

Миссия научно-образовательного электронного журнала «ОБРАЗОВАНИЕ И НАУКА В XXI ВЕКЕ» состоит в поддержке интереса читателей к оригинальным исследованиям и инновационным подходам в различных тематических направлениях, которые способствуют распространению лучшей отечественной и зарубежной практики в интернет пространстве.

Целевая аудитория журнала охватывает работников сферы образования (воспитателей, педагогов, учителей, руководителей кружков) и школьников, интересующихся вопросами, освещаемыми в журнале.

Материалы публикуются в авторской редакции. За соблюдение законов об интеллектуальной собственности и за содержание статей ответственность несут авторы статей. Мнение редакции может не совпадать с мнением авторов статей. При использовании и заимствовании материалов ссылка на издание обязательна.

© ООО «МОЯ ПРОФЕССИОНАЛЬНАЯ КАРЬЕРА»

© Коллектив авторов

РЕДАКЦИОННАЯ КОЛЛЕГИЯ:

Пестерев С.В. – гл. редактор, отв. за выпуск

Абдурасулов Абдуллажон Абдукаримович	доктор философии педагогических наук
Азамов Жасурбек Муродович	доктор философии в области юриспруденции
Артикова Мухайохон Ботиралиевна	доктор педагогических наук, доцент
Ахмедов Ботиржон Равшанович	доктор философии в филолог. науках (PhD), доцент
Батурин Сергей Петрович	кандидат исторических наук, доцент
Бекжанова Айнура Мархабаевна	доктор философии по педагог. наукам (PhD), доцент
Бекжанова Гулнара Маркабаевна	кандидат медицинских наук, преподаватель
Боброва Людмила Владимировна	кандидат технических наук, доцент
Богданова Татьяна Владимировна	кандидат филологических наук, доцент
Ботиров Аминжон Розимбоевич	кандидат биологических наук, доцент
Демьянова Людмила Михайловна	кандидат медицинских наук, доцент
Еремеева Людмила Эмировна	кандидат технических наук, доцент
Жуманова Фатима Ураловна	кандидат педагогических наук, доцент
Засядько Константин Иванович	доктор медицинских наук, профессор
Исломова Саидахон Тургуновна	доктор философии по техническим наукам (PhD), доцент
Кабулова Мехрибан Толыбаевна	доктор философии по педагог. наукам (PhD)
Казакова Раъно Машрабаевна	доктор философии по филологическим наукам (PhD)
Кодиров Хасанбой Орибжонович	доктор философии педагогических наук
Колесников Олег Михайлович	кандидат физико-математических наук, доцент
Коробейникова Екатерина Викторовна	кандидат экономических наук, доцент
Ланцева Татьяна Георгиевна	кандидат экономических наук, доцент
Мухамедова Лола Джураевна	доктор философии по филологическим наукам (PhD)
Нарзикулова Фируза Ботировна	доктор психологических наук
Нобель Артем Робертович	кандидат юридических наук, доцент
Ноздрина Наталья Александровна	кандидат педагогических наук, доцент
Нуржанов Сабит Узакбаевич	доктор историч. наук (dsc), старший научный сотрудник
Олтаев Шавкат Собирович	кандидат экономических наук, доцент
Павлов Евгений Владимирович	кандидат исторических наук, доцент
Петрова Юлия Валентиновна	кандидат биологических наук, доцент
Попов Сергей Викторович	доктор юридических наук, профессор
Расулходжаева Мадина Ахмаджоновна	доктор философии по педагог. наукам (PhD), доцент

Рахматова Фотима Ганиевна	доктор философии по педагог. наукам (PhD), доцент
Рахмонов Азизхон Боситхонови	доктор педагогических наук, доцент
Таспанова Айзада Кенжебаевна	доктор философии (PhD) по экономическим наукам
Таспанова Жыгагул Кенжебаевна	доктор философии по педагог. наукам (PhD), доцент
Табашникова Ольга Львовна	кандидат экономических наук, доцент
Тўрабоева Мадинахон Рахмонжон қизи	кандидат педагогических наук, доцент
Тюрин Александр Николаевич	кандидат географических наук, доцент
Уразова Лариса Карамовна	кандидат исторических наук, доцент
Усубалиева Айнура Абдыжапаровна	кандидат социологических наук, доцент
Утегенова Жамила Джолмурзаевна	доктор философии по эконом. наукам, доцент
Фаттахова Ольга Михайловна	кандидат технических наук, доцент
Ширинов Отабек Тувалович	доктор психологических наук (PhD)
Хамдамова Ситора Сафаровна	Доктор философии в области философских наук, доцент
Ханбабаев Хакимжан Икрамович	доктор педагогических наук (DSc)
Худайкулов Хол Джумаевич	доктор педагогических наук, профессор
Худойбердиева Хурият Каримбердиевна	доктор философии (PhD) в социальной философии
Ширинов Отабек Тувалович	доктор психологических наук (PhD)
Эшназаров Журакул	кандидат педагогических наук, профессор
Эшназарова Фарида Журакуловна	доктор философии по философии (PhD)
Юнусова Бахора Ахтамжоновна	кандидат филологических наук, ассистент
Яхяева Сожида Абдурахимовна	доктор философии (PhD) в социальной философии

Mugallym Bashimova Oguljennet METHODOLOGY OF TEACHING ENGLISH AS A FOREIGN LANGUAGE AT THE UNIVERSITY LEVEL	226
Gurbanov Guwanchgeldi, Muhadov Dowletgeldi, Rejepov Hushnut, Agajumayev Kemal, Berdiyev Gelli STRATEGIC MANAGEMENT AND GROWTH OF ENTERPRISES IN DYNAMIC MARKET ENVIRONMENTS	231
Charyyev Ybrayym, Gylyjov Annamyrat METHODOLOGY OF TEACHING WEB PROJECTS AND TECHNOLOGIES	236
Дурдыев Р. ЭКОЛОГИЧЕСКИЕ ФАКТОРЫ, ВЛИЯЮЩИЕ НА ПЛОТНОСТЬ ПОПУЛЯЦИИ ФАЗАНОВ В РАЗЛИЧНЫХ ПРИРОДНЫХ ЗОНАХ	241
Tejendurdyeva Ogulgozel Begmuradovna INNOVATIVE TECHNOLOGIES IN TEACHING AND LEARNING ENGLISH	246
Hojamuhammedov Allayar, Amanov Berdimuhammet FRANCHISING MODEL FOR DEVELOPMENT AND GOVERNMENT	251
Hommakova Merjen, Mowlamova Oguljennet EFFECTIVE METHODS OF TEACHING READING AND WRITING TO TECHNICAL PHILOLOGY STUDENTS	256
Аннамухаммедов Керим, Какаев Ислам, Шаназарова Алтын, Рахманова Марал РОЛЬ FTP-ПРОТОКОЛОВ И ОБЩИХ СЕТЕВЫХ ТЕХНОЛОГИЙ В ЭФФЕКТИВНОМ ОБМЕНЕ ДАННЫМИ В УСЛОВИЯХ ЦИФРОВОЙ ТРАНСФОРМАЦИИ	261
Guncha Serdarova DIFFERENT METHODS IN TEACHING VOCABULARY	267
Shohradova Jemal, Atahanova Ogulnur, Kadyrova Gowher PREPARATION OF PROTEIN POWDER AND ISOLATION OF CHITIN-CHITOSAN FROM OYSTER MUSHROOMS (PLEUROTUS OSTREATUS)	273
Garatayev Hangeldi, Mowlamova Oguljennet METHODOLOGICAL APPROACHES TO TEACHING TECHNICAL ENGLISH	278
Mahri Kerimova THE PRINCIPLE OF STATE SOVEREIGNTY IN INTERNATIONAL LAW	283
Misekova Guncha, Geldiyeva Gulnaz, Annamyradova Mahrijemal IMMUNOLOGY: A COMPREHENSIVE OVERVIEW OF THE IMMUNE SYSTEM AND ITS FUNCTIONS	286

ФИО автора(-ов): *Misekova Guncha, student.*

Geldiyeva Gulnaz, student.

Annamyradova Mahrijemal, teacher.

Oguzhan Engineering and Technology University of Turkmenistan.

Ashgabat, Turkmenistan

Название публикации: «IMMUNOLOGY: A COMPREHENSIVE OVERVIEW OF THE IMMUNE SYSTEM AND ITS FUNCTIONS»

Abstract: Immunology is the branch of biomedical science concerned with the study of the immune system and its functions. The immune system plays a critical role in protecting the body against harmful invaders, including bacteria, viruses, fungi, and parasites. This paper provides an in-depth overview of immunology, exploring the components of the immune system, the mechanisms behind immune responses, and the importance of immunological research in disease prevention and treatment. The immune system is divided into innate and adaptive immune responses, both of which work together to ensure a robust defense mechanism. The paper also discusses the significance of immunological memory, vaccination, autoimmune diseases, and emerging immunotherapies for the treatment of cancer and infectious diseases. Recent advancements in immunology are revolutionizing medicine and shaping the future of healthcare.

Keywords: Immunology, Immune System, Innate Immunity, Adaptive Immunity, Immunological Memory, Vaccination, Autoimmune Diseases, Immunotherapy, Disease Prevention, Cancer Treatment

1. Introduction

Immunology is a multidisciplinary field that examines the body's defense system against harmful pathogens, including bacteria, viruses, fungi, and parasites. The immune system is a highly sophisticated network composed of cells, tissues, and organs, which work together to identify and neutralize foreign invaders while distinguishing them from the body's own cells. This remarkable system is divided into two main branches: innate immunity and adaptive immunity. Both systems are

essential for maintaining health and fighting infections. As research advances, immunology has become increasingly important in the development of vaccines, treatments for autoimmune diseases, and the development of immunotherapies for cancer.

2. The Components of the Immune System

2.1 Innate Immunity

Innate immunity is the body's first line of defense, acting as a non-specific response to a wide variety of pathogens. This branch of immunity involves physical barriers such as skin, mucous membranes, and acidic environments in the stomach, which prevent the entry of pathogens. If pathogens manage to breach these barriers, the innate immune system is activated and employs various immune cells, such as neutrophils, macrophages, and dendritic cells, to recognize and eliminate the invaders. The innate immune response also includes inflammation, which helps recruit immune cells to sites of infection.

2.2 Adaptive Immunity

Adaptive immunity, also known as acquired immunity, is a more specialized and targeted response to pathogens. Unlike innate immunity, adaptive immunity is pathogen-specific and has memory, allowing the immune system to respond more efficiently to subsequent encounters with the same pathogen. The adaptive immune system involves two main types of lymphocytes: B-cells and T-cells. B-cells produce antibodies that target pathogens, while T-cells play a crucial role in killing infected cells or assisting other immune cells. The adaptive immune response takes longer to activate but is highly effective in eliminating infections.

2.3 The Role of Antibodies

Antibodies, also known as immunoglobulins, are proteins produced by B-cells in response to foreign antigens. These antibodies bind to specific antigens on the surface of pathogens, neutralizing them or marking them for destruction by other immune cells. There are five main classes of antibodies: IgA, IgD, IgE, IgG, and IgM, each with unique roles in the immune response.

2.4 Immune Cells and Their Functions

The immune system consists of various cell types that each have specific roles in defending the body. These cells include:

- **Macrophages:** Engulf and digest pathogens through phagocytosis.
- **Neutrophils:** The first responders to infection and key players in the innate immune response.
- **Dendritic Cells:** Act as messengers between the innate and adaptive immune systems, presenting antigens to T-cells.
- **T-cells:** Involved in cellular immunity, either by directly killing infected cells or coordinating the immune response.
- **B-cells:** Produce antibodies and contribute to humoral immunity.

3. Immunological Memory and Vaccination

One of the most important features of the adaptive immune system is immunological memory. After an initial infection, the immune system creates memory cells that remember the pathogen, providing long-lasting immunity. This allows the immune system to mount a faster and stronger response if the pathogen is encountered again.

Vaccination is a key tool in harnessing immunological memory. By introducing a harmless version or a fragment of a pathogen into the body, vaccines stimulate the immune system to produce antibodies and memory cells without causing disease. Vaccines have been instrumental in preventing infectious diseases and have led to the eradication of diseases such as smallpox and significant reductions in the incidence of polio, measles, and other viral infections.

4. Autoimmune Diseases and Immune System Disorders

In some cases, the immune system malfunctions and attacks the body's own tissues, leading to autoimmune diseases. Examples of autoimmune disorders include:

- **Rheumatoid Arthritis:** The immune system attacks the joints, causing inflammation and pain.
- **Type 1 Diabetes:** The immune system targets insulin-producing cells in the pancreas.

- **Multiple Sclerosis:** The immune system attacks the protective covering of nerve fibers.

Additionally, immune deficiencies can occur, resulting in a weakened immune system that is unable to mount effective responses to infections. Primary immunodeficiencies are inherited, while secondary immunodeficiencies can arise from factors such as infections (e.g., HIV/AIDS), medications, or malnutrition.

5. Immunotherapy and the Future of Immunology

Immunotherapy represents one of the most promising developments in modern medicine, particularly in the field of oncology. Immunotherapy involves using the body's own immune system to fight cancer. There are several types of immunotherapy, including:

- **Checkpoint Inhibitors:** These drugs block molecules that prevent immune cells from attacking cancer cells.
- **CAR-T Cell Therapy:** This therapy involves modifying a patient's T-cells to enhance their ability to target cancer cells.
- **Cancer Vaccines:** Designed to stimulate the immune system to recognize and attack cancer cells.

Immunotherapies have shown significant promise in treating cancers that are resistant to traditional therapies like chemotherapy and radiation.

6. Recent Advances in Immunology

Recent research in immunology has led to several breakthroughs, such as the development of mRNA vaccines (e.g., Pfizer-BioNTech and Moderna COVID-19 vaccines), which represent a novel way of stimulating an immune response. Additionally, the exploration of the human microbiome has revealed its critical role in modulating immune function, suggesting that gut bacteria could influence the immune system's response to infections and diseases.

Advancements in gene editing, such as CRISPR-Cas9, also hold the potential to revolutionize immunology by allowing for the precise modification of immune cells for therapeutic purposes, such as the treatment of genetic immune disorders.

7. Conclusion

Immunology is a rapidly evolving field that plays a crucial role in understanding the body's defense mechanisms against infections, cancer, and other diseases. The study of immunology has led to the development of vaccines, immunotherapies, and diagnostic tools that are saving lives worldwide. As research continues, new therapies and treatments are expected to emerge, offering hope for individuals suffering from immune system disorders, autoimmune diseases, and cancer. The future of immunology holds great promise, with innovations that could lead to more effective treatments and improved health outcomes for patients globally.

References

1. Janeway, C. A., Travers, P., Walport, M., & Shlomchik, M. J. (2001). Immunobiology (5th ed.). Garland Science.
2. Murphy, K., & Weaver, C. (2016). Janeway's Immunobiology (9th ed.). Garland Science.
3. Abbas, A. K., Lichtman, A. H., & Pillai, S. (2014). Cellular and Molecular Immunology (8th ed.). Elsevier.
4. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2002). Molecular Biology of the Cell (4th ed.). Garland Science.
5. Rafiq, S., & Hosen, Z. (2020). Advances in Immunology and Immunotherapy for Cancer Treatment. Springer.

© Misekova Guncha, Geldiyeva Gulnaz, Annamyradova Mahrijemal. 2025