

## When Immunity is Weakened, Disease Occurs

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### RESEARCH ARTICLE

#### ABSTRACT

The immune system, with its constant work, defends us from various microorganisms and diseases. When immunity is weakened, disease occurs. In this case, the microorganism overcomes the barrier set up by the immune system and attacks our cells. Creating immunity is the body's ability to defend itself against various diseases, infections and contagions. Although each of us has a certain immunity, some stronger, some weaker, it is important to additionally strengthen it, that is, to activate it from time to time, especially in a certain season of the year.

#### KEYWORDS

Immunity, Infectious Diseases, Inflammation, Immune System, Vaccine, Health

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### INTRODUCTION

Immunity encompasses precise and nonspecific additives [1]. Nonspecific additives act as barriers or eliminators of a big quantity of pathogens no matter their antigenic potential. Other additives of the immune system adapt to every new unknown contamination, this means that they've the capacity potential to create immunity for every character sort of pathogen. Creating immunity is the frame's potential to shield itself in opposition to diverse illnesses, infections and contagions. Every man or woman has positive immunity, a person stronger, a person weaker, it's far vital to similarly toughen it or every now and then spark off it, specially at a positive season.

The immune system has a enormous task. In the best phrases, it have to guard the host from cancers and infectious sickness whilst cautiously regulating responses in order now no longer to inflict any lengthy-time period harm of host tissues [2]. These immune responses are now no longer perfect: cancers do expand even withinside the face of an preliminary immune reaction; infectious illnesses do crush the immune machine and declare lives; and autoimmune illnesses are a purpose of big pathology in the ones afflicted. Despite those imperfections, a brilliant quantity of facts shows harnessing the useful responses of the immune machine affords progressive possibilities to deal with sufferers laid low with cancers, continual infections, and autoimmune illnesses. This subject, called immunotherapy, has hastily evolved over the beyond 2 many years and produced some of powerful remedies especially withinside the most cancers arena. Immunotherapies are primarily based totally on both antibody mediated (humoral immunity) or cell mediated immunity through activating T cell immune reaction.

### INFECTIOUS DISEASES

Infectious diseases are as a result of viruses, bacteria, fungi, and parasites and are a major cause of human struggling in phrases of each human morbidity and mortality in the course of history [3]. The dissemination of infectious illnesses changed into laid low with diverse epochs in human civilization. For example, parasitic and zoonotic infections have grow to be extra time-honored after animals' domestication, whilst airborne infections of viral and bacterial etiology have grow to be not unusualplace after big settlements and urbanization. Throughout history, humanity changed into laid low with big pandemics which includes plague, smallpox, cholera, influenza, and Coronavirus disease 2019 (COVID-19), in addition to through the extra continual infections, which includes tuberculosis and syphilis. Morbidity because of infectious diseases is time-honored in spite of the current improvements in analysis, remedy, and management protocols. World Health Organization (WHO) stated that there are 300–500 million instances of malaria, 333 million instances of sexually transmitted diseases (STDs) (e.g., syphilis, gonorrhea, chlamydia, and trichomonas), 33 million instances of the Human immunodeficiency virus (HIV)/ received immunodeficiency sickness syndrome (AIDS), 14 million people inflamed with tuberculosis, and 3–5 million instances of cholera, worldwide.

The immune reaction to infectious microorganisms may be categorised into important classes: innate and adaptive immune responses. These responses are inseparable. For instance, activation of innate receptors (e.g., toll-like receptors (TLRs)) ends in the launch of cytokines, which leads to activation of

the adaptive immune system. The innate immune reaction to a pathogen starts whilst pathogen-associated molecular patterns (PAMPs) of the bacterial pathogens result in sample popularity receptors (PRRs) of the innate immune system. The innate immune system triggers antigen-precise responses produced through the adaptive immune system. This is accompanied through the secretion of pro-inflammatory and anti-inflammatory elements that assist comprise the contamination. In turn, pathogens manage host protection procedures (e.g., keep away from phagocytosis) to live to tell the tale and in the long run replicate. Adaptive immunity consists of antigen-precise responses that are enormously tailored to the precise pathogen and are exactly regulated thru innate immune cells' crosstalk. It has advanced to offer a flexible and as it should be calibrated repertoire of receptors which could differentiate self- and non-self-antigens.

During maturation, naive B and T lymphocytes undergo antigen receptor gene reorganization to create a diverse repertoire comprising antigen-precise receptors which could apprehend all capacity antigens. After overcoming pathogen, pathogen-precise lengthy-lived reminiscence lymphocytes can be evolved. These reminiscence cells fast and robustly respond to destiny encounters with the invading microorganism and synthesize new effector cells to oppose the contamination. Whether an infectious microorganism is an "old acquaintance" or a newly surfaced danger, the immune system's combat in opposition to it is usually the preliminary line of protection it encounters. With vaccines and powerful cures regularly unavailable, the immune machine's tries to eliminate infectious retailers or inflamed cells are usually the handiest way to do away with them. Deciphering the immune machine similarly to the infectious microorganisms processes to sabotage it's far of key importance to the researchers and clinicians.

Accurate and well timed analysis of contamination is critical for a success and targeted remedy. However, habitual microbiological popularity is inefficient and regularly behind schedule to the volume that makes it clinically impractical. The immune machine is able to a rapid, excessive-sensitivity, and excessive-specificity popularity of a vast spectrum of microbes that has been delicate over tens of thousands and thousands of years of evolution. Therefore, the early immune reaction is in all likelihood to offer a long way higher perception into the proper nature and severity of microbial infections in comparison to traditional tests.

### INFLAMMATION

Inflammation is usually an adaptive organic reaction to pathogen contamination and tissue damage that serves to interact the immune system and tissue restore mechanisms [4]. Pathogens and tissue harm are regularly to begin with detected through sample popularity receptors, which includes toll-like receptors (TLRs), especially expressed through cells that take part within the innate immune reaction. Upon the triggering of such receptors, indicators are transmitted that spark off transcription elements, consisting of NF- $\kappa$ B and activator protein-1 (AP-1) elements, that alter hundreds of genes that extend the preliminary inflammatory reaction, generate antimicrobial activities, and provoke adaptive immunity. Sterile infection caused through endogenous molecules, which includes additives of useless cells and protein aggregates, additionally cause infection thru sample popularity receptors, consisting of TLRs. Coordination of the innate and adaptive immune structures is needed for renovation of ordinary tissue homeostasis and powerful responses to contamination and damage, with deregulation of those tactics contributing to continual inflammatory illnesses in lots of organ structures.

Numerous terrible comments mechanisms feature to reduce inflammatory responses. These include induction of proteins that inhibit sign transduction pathways (e.g., Suppressors of cytokine signaling SOCS proteins), manufacturing of soluble or cellular-floor mediators with anti-inflammatory activities (e.g., IL-10, TGF $\beta$ , resolvins, and ligands for TAM receptor tyrosine kinases), and transcriptional repression of inflammatory reaction genes through contributors of the nuclear receptor own circle of relatives of transcription elements (e.g., glucocorticoid receptors (GRs), liver X receptors, and peroxisome proliferator-activated receptors). The emerging popularity that infection might also additionally make a contribution to the pathogenesis of a quantity of neurodegenerative illnesses has caused a developing hobby in capacity roles of nuclear receptors in regulating inflammatory responses inside the nervous system.

### IMMUNOPROTEOMICS

Harnessing the cappotential of the immune system to mount sturdy and powerful responses within the face of pathogenic undertaking or most cancers improvement is hastily growing into frontline remedy for those illnesses [2]. This subject, referred to as immunotherapy, is based on the activation of antibody mediated B cellular and/or cellular mediated T cell responses that without delay goal diseased cells and tissues. One of the maximum tough elements of growing powerful immunotherapeutics, however, is first figuring out the goal antigens that the immune system must apprehend and 'assault'. Among the various strategies to be had these days immunoproteomics is ideally fitted to pick out applicable goal antigens. Immunoproteomics combines reducing area proteomic methodologies to pick out physiologically applicable goal antigens expressed and/or produced through the diseased cells with standard immunological strategies to validate those goals. In this topic, we explore how immunoproteomics can form the improvement of powerful immunotherapeutics.

### CELLS

Cell mediated immunity, pushed through CD4<sup>+</sup> and/or CD8<sup>+</sup> T lymphocytes, performs a essential position in protecting the host in opposition to cancers and infectious illnesses [2]. These responses start in secondary lymphoid organs (i.e. lymph nodes or spleen) whilst dendritic cells and/or macrophages gift fragments of protein antigens, termed peptide epitopes, to the T cells. These peptide epitopes are generated through some of antigenic processing pathways. Antigens endocytosed from the extracellular surroundings are damaged down within the endosomal/lysosomal system and loaded onto foremost histocompatibility class (MHC)-II molecules for presentation to CD4<sup>+</sup> T cells. In contrast, antigens biosynthesized interior of the imparting cell are damaged down through the proteasome, peptide fragments shipped into the endoplasmic reticulum, trimmed similarly, and loaded onto MHC-I molecules for presentation to CD8<sup>+</sup> T cells. Importantly, there's a incredible deal of overlap among those pathways; endocytosed antigenic fragments may be processed through the proteasome and load onto MHC-I molecules whilst biosynthesized antigens may be processed within the endosomal/lysosomal machine and loaded onto MHC-II molecules. This "cross-talk" certainly broadens the quantity of goals vital for an efficient cell mediated reaction. In ordinary, wholesome cells, self-proteins undergo those pathways and an array of peptides is displayed at the MHC molecules. These peptides are identified as 'self' and consequently do now no longer initiate a T cell reaction. However, adjustments in this MHC signature of cells alert T cells to adjustments within the host that can be related to contamination, malignant transformation, or different ordinary cellular tactics, ensuing in a cascade of occasions that result in a cell mediated immune reaction. In this case, whilst the right "match" is found, the nicely matched T cell clone is activated, expands, and migrates to the tumor or site of contamination to mediate effector features.

## VACCINE

Pathogenic organisms are ubiquitous in nature and gift a regular undertaking for an character's immune system [2]. Before the improvement of vaccines polio virus, smallpox, measles, and whooping cough have been regular threats. As vaccines have been evolved and distributed, morbidity and mortality as a result of those organisms precipitously dropped; smallpox changed into absolutely eliminated, and polio virus might also additionally be eliminated 1 day within the close to destiny.

Traditional vaccines presenting safety in opposition to infectious organisms are prophylactic, designed to stimulate an immune reaction to a weakened or inactivated model of a pathogen or in opposition to macromolecular additives of a pathogen (i.e. proteins, carbohydrates, etc.). The aim of prophylactic vaccination is to stimulate the innate and adaptive immune structures earlier than publicity to the wild-kind or circulating pathogen. This publicity must, ideally, generate reminiscence B and T lymphocytes which could reply hastily and robustly to a secondary undertaking. Although each B and T memory responses are critical for safety in opposition to reinfection with an organism, the big majority of prophylactic vaccines in use these days are designed to result in a robust B cell mediated reaction characterised through the secretion of antigen precise neutralizing antibodies. Immunogenicity of a vaccine is regularly decided through without delay measuring the robustness of the B cell reaction. Although B cell mediated responses are essential for safety, vaccines that predominantly stimulate antibody responses have their shortcomings. First, many lines of pathogens circulate in nature and it isn't assured that antibodies precipitated through one vaccine will guard in opposition to all lines. Indeed, a brand new influenza vaccine method is required nearly each yr because of antigenic float or shift inside circulating viruses. Secondly, antibodies directed in opposition to one stress or serotype of a virus would possibly in reality beautify infectivity of a second strain/serotype. This antibody based enhancement is visible in sufferers inflamed with different lines of dengue virus and might cause Dengue hemorrhagic fever and Dengue shock syndrome (DSS).

## IMMUNIZATION

Since its beginning, immunology has advanced beneath the wings of microbiology [5]. The medical cognition that the immune reaction to microorganisms is handiest one of the immune responses, and that this reaction may be prompted in nearly each organic macromolecule beneath positive situations, has inspired the improvement of immunology as an unbiased medical discipline. Modern immunology incorporates a big quantity of disciplines that take a look at the systems and physiological features of the immune system, immunity to infections, situations of immune hypersensitivity (allergy), immunological deficiencies (immunodeficiencies), immune responses to transplantation and tumor, autoimmune illnesses, in addition to numerous immunodiagnostic procedures.

Vaccines feature through stimulating the immune system and prompting a primary immune reaction to an infecting pathogen or to molecules derived from a specific pathogen [6]. The immune reaction elicited through this primary publicity to vaccine pathogen creates immunological reminiscence, which entails the era of a pool of immune cells in an effort to apprehend the pathogen and mount a higher or secondary reaction upon next publicity to the virus or bacterium. In a success immunization, the secondary immune reaction is enough to save you sickness within the inflamed character, in addition to save you the transmission of the pathogen to others. For communicable illnesses, immunizations guard now no longer handiest the character who gets the immunization, however additionally others with whom she or he has contact. High degrees of vaccination in a network growth the quantity of folks who are much less inclined or proof against contamination and propagation of the infectious agent. Unvaccinated people or the ones who've now no longer evolved immunity to this pathogen are afforded an oblique degree of safety due to the fact the ones with immunity lessen the unfold of the pathogen in the course of the complete populace. The large the percentage of human beings with immunity, the more the safety of these with out immunity. This impact is referred to as "herd immunity." Herd immunity is an vital phenomenon as immunization packages hardly ever attain one hundred percentage immunization in a populace; and in a few instances, formerly vaccinated persons won't show off powerful immunity and sickness might also additionally end result from publicity to the pathogen. For safety, immunization of now no longer handiest ourselves however additionally our acquaintances is vital.

The overwhelming protection and effectiveness of vaccines in modern-day use in stopping severe sickness has allowed them to advantage their preeminent position within the habitual safety of health. Before an immunization is added for populace-extensive use, it's far examined for efficacy and protection. However, immunization isn't with out dangers. For example, it's far properly mounted that the oral polio vaccine on uncommon event reasons paralytic polio and that vaccines every now and then cause anaphylactic surprise. Given the massive use of vaccines; nation mandates requiring vaccination of kids for access into college, college, or day care; and the significance of making sure that believe in immunization packages is justified, it's far crucial that protection worries acquire assiduous attention.

## HERD IMMUNITY

Understanding public health calls for a eager know-how of the factors wherein people have well matched or conflicting pastimes and needs [7]. One such factor is "herd immunity" in opposition to infectious sickness. When someone gets a vaccination, she has a miles more hazard of being covered from that contamination—receiving character advantage—however additionally facilitates to guard others within the network who are at risk of contamination. Some vaccines advantage handiest the character, like that for tetanus, that's a sickness that isn't contagious however effects from publicity to a toxin within the surroundings that reasons neurological harm and dying and is hard to deal with. However, the bulk of required vaccines do now no longer simply guard the kid who gets inoculation, however additionally prevents publicity of life-threatening ailments within the disabled, the aged, the immune-compromised, the babies too younger to be vaccinated, and the pregnant women whose fetuses might be devastated through those ailments, in addition to the ones few those who did now no longer advantage immunity from a vaccine they obtained.

If a network-level immunity rate, called herd immunity, of about 85–ninety five percentage (relying at the sickness) is maintained, surely all contributors of the network are covered from contamination. It is not possible to create immunity in one hundred percentage of a populace. With herd immunity, illnesses are blocked from achieving folks that might be at danger through those who are vaccinated. As an example, if Child A has measles and Child C is unvaccinated, Child B is a totally vaccinated middleman who protects Child C from contamination. This is even extra powerful whilst a excessive percent of the populace are completely vaccinated, growing extra Bs to guard the occasional C. Public health mandates to require vaccination for school attendance—wherein kids are in dense quarters and in all likelihood to proportion dangers of publicity to sickness—goal to growth the numbers of vaccinated kids who can guard that prone Child C and buffer the danger of contamination from the inflamed Child A. Herd immunity can soak up handiest a small part of the population failing to vaccinate. Therefore, the philosophy of herd immunity holds that the handiest exemptions must be for the ones who can't correctly acquire vaccines due to a scientific circumstance or due to the fact they're too young, or the ones for whom vaccines do now no longer work. Essentially, the ones who may be vaccinated and generate immunity will assist to guard the maximum prone of their network. Parents who reject vaccines for his or her kids advantage from herd immunity, however refuse to make a contribution to it, making them free-riders to different kids's immunity.

## AUTOIMMUNITY

Autoimmunity may be widely described as a particular immune effector reaction in opposition to self additives that inflicts damage at the host [8]. The self-detrimental reaction is regularly of inflammatory nature, however different effector mechanisms, e.g., supplement activation through autoantibodies certain to self systems, also can be the foremost purpose of pathology. Autoimmunity must be prominent from autoreactivity, the latter denoting the presence of self-precise antigen receptors and antibodies withinside the frame that continue to be with out dangerous consequences. The manifestations of autoimmunity are referred to as autoimmune illnesses (AIDs), which constitute a rather big assemblage of various ailments with awesome symptoms, places and pathomechanisms. The handiest commonality of AIDs on which maximum individuals of the subject agree is that the pathology is the effect of a failure in a single or any other mechanism of self tolerance. Therefore, autoimmunity may be seemed as the down-aspect of self tolerance, in addition to the maximum in all likelihood selective pressure that has pushed self–non-self discrimination. In this context, the frequency of AIDs withinside the populace (as much as 5%) might also additionally replicate the restrict of herbal selection, i.e., that the latter can't perform to perfection, handiest to adequacy described as the extent of damage that now no longer threatens the procreation of the species.

The immune system is usually tasked with clearing invading microorganisms and eliminating converted or malignant cells from the host [2]. The considerable majority of the responses required to clean those demanding situations are pro-inflammatory and are observed through the secretion of cytokines and chemokines making the host an uninviting habitat for the pathogen or altered cells. However, those pro-inflammatory responses may be detrimental to the host, and in a few instances, the pathology visible in the course of an contamination is because of the immune reaction itself rather than the pathogen. As such, those responses have to be tightly regulated to keep away from overt harm and pathology to host tissues. This law is executed in a whole lot of methods consisting of the presence of regulatory cells that feature in the course of innate and adaptive responses. These cells launch anti-inflammatory cytokines and/or without delay adjust the interest of responding cells so as to hose down down the immune responses and to save you lengthy time period, systemic infection withinside the host. As pathogens are a regular danger to the immune machine there have to be a stability among the pro-inflammatory, pathogen clearing responses and the anti-inflammatory regulatory responses. Tipping the scales in both course can cause severe immunopathology and the incapability to clean an invading organism. In positive sickness states like most cancers as an example the stability is tipped in prefer of law. Multiple regulatory mechanisms are actively stopping a sturdy pro-inflammatory reaction and consequently, an affective immune reaction in opposition to the malignant cells. However, whilst the stability is tipped withinside the different course toward a extra inflammatory surroundings the immune machine might also additionally start a sturdy assault in opposition to otherwise ordinary and wholesome tissues, a manner referred to as autoimmunity. Undoubtedly each the innate and adaptive fingers of the immune machine are essential drivers of autoimmune responses. However, for the cause of this phase we can awareness on the adaptive immune machine, especially T lymphocyte responses.

## IMMUNOTHERAPY

Immunotherapy reduces immunosuppression through blockading the terrible regulatory receptors and inhibitory checkpoints [CTLA-4 and programmed death-1 (PD-1)], blockading immunosuppressive cytokines [transforming growth factor- $\beta$  (TGF- $\beta$ ), IL-10, and TNF], blockading immunosuppressive enzymes [indoleamine 2,3-dioxygenase (IDO)], and targeting the T regulatory cells [9]. Blockade or inhibition of terrible regulators of the immune system complements endogenous antitumor responses in addition to antitumor interest of the immune system following different healing methods.

CTLA-4 (CD152) is expressed on T cells in aggregate with a extensive sort of different immune cells. It acts as a terrible immune regulatory receptor that switches off T-cell assaults to tumor cells. Indeed, CTLA-4 is one of the important gamers in setting up peripheral tolerance. It competes with CD28 to bind to B7-1/B7-2 with better affinity and avidity. Two mAbs were evolved to dam CTLA-4: ipilimumab (MDX-010) and tremelimumab (CP-675,206). Both of those antibodies are beneath research for a extensive variety of cancers. Tremelimumab has been examined withinside the remedy routine of sufferers with metastatic or refractory melanoma, colorectal cancer, and prostate cancer. Unfortunately, favorable reaction in phrases of tumor regression and development of survival changed into handiest detected in much less than 10% of sufferers. Results of trials with ipilimumab have been extra positive, and ipilimumab has obtained FDA acclaim for sufferers with metastatic melanoma. In addition, ipilimumab blended with nivolumab has been accepted for the remedy of sufferers above the age of 12 years antique who had metastatic colorectal most cancers with MSI-H or dMMR who confirmed development in spite of previous remedies. PD-1 is an inhibitory receptor gift on activated T cells and B cells and has important ligands PD-L1 and PD-L2. PD-L1 has a vast expression on now no longer handiest immune cells however additionally nonimmune and tumor cells, whereas PD-L2 expression is restrained to antigen-imparting cells (APCs). PD-L1 is one of the maximum vital actors withinside the renovation of immunosuppressive microenvironment round tumor cells. PD-1 blockading antibody, CT-011, is beneath research for sufferers with superior hematological malignancies and a couple of myeloma.

Anti-inflammatory cytokines IL-10 and TGF- $\beta$  are produced through tumor cells and suppress antitumor responses. Anti-TGF- $\beta$  antibodies at the moment are in improvement for most cancers immunotherapy. Initial reports on animal fashions of osteosarcoma decreased T regulatory cellular numbers and improved cytotoxic T lymphocyte numbers, thereby stopping the increase of recent metastases. Fresolimumab, a totally human anti-TGF- $\beta$ , is now produced and can be examined withinside the remedy of most cancers sufferers. Anti-IL-10 antibodies and anti-IL-10 receptor antibodies have capacity antitumor interest, however they've now no longer presently entered into clinical trials for most cancers sufferers. In addition, infliximab, an anti-TNF- $\alpha$  antibody, changed into examined in sufferers with RCC and ended in 16% partial reaction and 16% stable sickness amongst recipients. TNF- $\alpha$  is an inflammatory cytokine, and its improved degrees were related to bad analysis in most cancers sufferers.

## CANCER

Cancer is a complex sickness as a result of unopposed dysregulated cell proliferation [10]. During neoplastic transformation, an ordinary cell acquires new traits that permit cell survival, replication, invasiveness, and dissemination. Despite the reality that most cancers cells display enormous heterogeneity in phenotype and feature, they proportion a few salient functions that permit malignant behavior. These not unusualplace trends have been subsumed through Hanahan and Weinberg beneath eight “hallmarks of most cancers”. The hallmarks of most cancers represent maintaining proliferating signaling, faulty proliferation suppression, recalcitrance to programmed cell dying, overcoming telomere shortening, inducing angiogenesis, functionality to invade the surrounding tissue and disseminate to remote organs, altered cellular metabolism, and evading immune responses in opposition to most cancers. Collectively, most cancers cells are self-sufficient proliferators which have circumvented intrinsic checkpoints of cellular disorder and conquered the encompassing surroundings to foster their increase and development.

The immune system is a key participant withinside the biology of most cancers. Beyond intrinsic cellular regulatory mechanisms and different defenses at the extent of tissue organization, the immunemachine appreciably contributes to stopping the outgrowth of converted cells and their development. Considering the cappotential of the immune system to demolish converted cells, it changed into postulated that the evasion of immune responses changed into a specific and crucial guideline for malignant cells to develop and progress. Intriguingly, it changed into ultimately discovered that the immune

machine might also additionally make a contribution to most cancers development through affecting most cancers cell survival, proliferation, angiogenesis, invasion, and metastasis. Thus, the immune system performs vital and multifaceted roles in most cancers pathogenesis.

Harnessing the immune system for most cancers remedy changed into a progressive step to combat in opposition to most cancers. Cancer immunotherapy exploits the additives of the immune system to without delay kill malignant cells or beautify host immune responses in opposition to most cancers. Several most cancers immunotherapeutic methods which includes passive antibody remedy, immune checkpoint inhibition, and adoptive immune cell remedy are presently being used for the remedy of most cancers sufferers. Cancer immunotherapy has come of age, and ongoing studies on most cancers immunology and immunotherapy is a desire for higher most cancers remedy alternatives withinside the destiny.

## CONCLUSION

The immune system is a system of organs that protects the organism from attacks by foreign microorganisms, their chemical substances and own changed and worn out cells. The immune system consists of organs located throughout the body and cells that participate in immune reactions and can migrate throughout the body. The organs of the immune system are the bone marrow, thymus and lymph nodes. Innate immunity forms the first line of defense of the organism, it exists before contact with the causative agents of the disease and reacts in the same way to any harmful agent. Acquired immunity develops in contact with pathogens, does not exist before the first contact and takes days, weeks or months to develop.

## REFERENCES

- 1) Franjic S. Immunity is the body's ability to defend itself against various diseases, infections and contagions. *J Clin Immunol.* 2022, 5:117.
- 2) Comber J, Philip R. Applications of cutting-edge immunoproteomics technology in human immunotherapy in Jain, P; Ndhlovu, L. C. (Eds): *Advanced concepts in human immunology - prospects for disease control*, Springer Nature Switzerland AG, Cham, Switzerland. 2020, 121-138.
- 3) Saleki K, Razi S, Rezaei N. Infection and immunity in Rezaei, N. (Eds): *Clinical Immunology*, Academic Press, Elsevier, London, UK. 2023, 493-494.
- 4) Saijo K, Croti A, Glass CK. Nuclear receptors, inflammation, and neurodegenerative diseases in Alt FW, Austen KF, Honjob T, Melchers F, Uhr JW, Unanue ER. (Eds): *Advances in immunology*, Academic Press, Elsevier, San Diego, USA. 2010, 22-23.
- 5) Franjić S. In shortly about immunity. *EC Clin Med Case Rep.* 2019, 1-8.
- 6) Stratton K, Ford A, Rusch E, Clayton EW. (Eds) *Adverse effects of vaccines - evidence and causality*, National Academy of Sciences, Washington, USA. 2012, 28.
- 7) Reich JA. *Calling the shots - Why parents reject vaccines*, New York University Press, New York, USA. 2016, 9-10.
- 8) Nagy ZA. *A history of modern immunology - The path toward understanding*, Academic Press, Elsevier, London, UK. 2014, 281.
- 9) Aryan Z, Keshavarz-Fathi M, Mellstedt H, Rezaei N. Cancer immunotherapy confers a global benefit in Rezaei, N. (Eds): *Cancer immunology - cancer immunotherapy for organ-specific tumors*, Second Edition, Springer Nature Switzerland AG, Cham, Switzerland, 2020, 22.
- 10) Sharif PM, Khoshbin AP, Nasrollahzadeh E, Keshavarz-Fathi M, Rezaei N. *Tumor immunology in Rezaei, N. (Eds)*, Clinical immunology, Academic Press, Elsevier, London, UK. 2023, 245-246.