*Journal of Advances in Microbiology*

***21(6): 1-5, 2021; Article no.JAMB.67386***
***ISSN: 2456-7116***

# Brief Study of the Immune System and A Large Sea of Pathogens and Other things Side A

**Valdecir de Godoy Borges[1*]**

*[1]Faculty of Medicine São Judas Tadeu 2019, Brazil.*

***Author's contribution***

*The sole author designed, analyzed, interpreted and prepared the manuscript.*

***Article Information***

DOI: 10.9734/JAMB/2021/v21i630354
Editor(s):
(1) Dr. Pankaj Kumar, Dolphin (PG) Institute of Biomedical and Natural Sciences, India.
Reviewers:
(1) Hala Ali Abdel Salam, Cairo University, Egypt.
(2) Sandeep Kumar, Rajendra Institute of Medical Sciences (RIMS), India.
Complete Peer review History: http://www.sdiarticle4.com/review-history/67386

***Review Article***

***Received 01 March 2021***
***Accepted 04 May 2021***
***Published 18 June 2021***

## ABSTRACT

And I will destroy any man who dares to abuse my trust, I promise that you will be mine (Queen 1973) We begin and brief study with this song to illustrate in a simple and interesting way because aimunology itself is something extremely interesting the flagship the captain this boat will be the book cell and molecular immunology by Abul K Abbas, Andrew H. Liichtman and Shiv Pllai we will start from a hypothetical situation of a region injured by a piercing instrument that penetrates the skin layers and skeletal muscle tissues based on this arrangement as we will discuss in this case DAMPs Molecular Patterns Associated with Damages and PAMPs molecular patterns associated with pathogens in this part of the study we stick to pathogens linked to amino acids and their formation in chains of proteins TH1 and TH2 that would be mechanisms of intracellular aggressions such as viruses and microbacteria and mechanisms that attack ectracellular cells like bacteria in the hypotonic situation ethics that we comment on an instrument any sharp drill when the layers of the cells the phosphopipidic layers are injured and all extracellular content moves to the extracellular medium begins with a response called innate or cellular that is given by immune cells intact as macrophages dendritic cells are very important in the presentation of phagocyte antigens also obviously to a perception of the central nervous system pain and a conscious state this information reaches the cerebral cortex pain and is detected by nociceptors in response the central nervous system releases substance P in this initiation of injury the cells begins an inflammatory process and the damaged cell members these phospholipids generate the cascade of arachidonic acid in this process if this injury is resolved everything is solved with the first phase of defense which is the innate or cellular system in case of intra or intra pathogens extracellular remains and start m a process of aggression to the organism starts the second part of the defense that is acquired that has

**Corresponding author: E-mail: valdecirborgesengclinico@gmail.com, marxboetila@gmail.com;*

specific responses for extracellular and intra cellular pathogenic organisms the complementary immune system we did not address in this work this article is dedicated to my esteemed professors of the medical school São Judas Tadeu Cubatão

*Keywords: Th1; Th2; cellular response; specific response.*

## 1. INTRODUCTION

The present work intends to bring parts of the study on human immunology and its unfolding focusing on integral parts of the defense system in a hypothetical situation of defense in a hypothetical situation of an injury in which the non-vascularized epithelial tissue is broken, breaking the skin layers and when the skeletal musculature arrives, the injury will almost automatically be detected by the cerebral cortex and also detected by the components of the immunological system for this work, we will use some sources but it is up to me to endorse the use of books (cellular and molecular immunology 8 edition Abul K Abbas, Andrew H. Lichtman, Shiv Pillai) (Basic Histology Luiz C Junqueira, Jose Carneiro) (Histology Text and Atlas Di Fiori) (Histology Treatise Leslie P. Gartner) apprehensively is a somewhat boring study but with due understanding and calmness [1]. If something fascinating going back to our injury we start the process of detecting the central nervous system al and the immune system first line of defense called natural or native (provides the first line of defense against microorganisms, it consists of biochemical and cellular defense mechanisms that are in place even before infection prepared to respond quickly to infections [1]. We can also or and can find the immunity called natural or native as cellular immunity (In cellular immunity immunocompetent cells (cells with immune capacity) react and kill cells that exhibit foreign molecules on the surface such as bacteria, transplanted cells, malignant (cancerous) cells and cells infected by viruses BASIC HISTOLOGY 10 EDITION PAG 254) we will start a description of the cells of the native natural cellular immunity innate lymphoid cells (ILCs) we will start with this brief cell initiation and later we will enter space in others per hour we highlight these macrophages, neutrophils, dendritic cells and Natural Killer cells - NK of course physical barriers blood proteins these proteins are part of the system called a complement system that we will not address in this study but it is good to make it clear that these proteins are also part of the natural, native cellular immunity would be first line of defense stimulated by substance P and a neuropeptide neurotransmitter that acts as a neuromodulator facilitates inflammatory processes vomiting pain sensation by acting to stimulate nociceptors and found in the central and peripheral nervous system, we must not forget that the central nervous system plays a role in this event and it is worth mentioning that these steps do not run, let us say sequentially, these steps run simultaneously according to the course of the infectious process and its invading agent. those with this to facilitate understanding some altitudes as in the book may come with different nomenclatures such as (id2, T-Best, Gata3, RORγt, the three main groups of innate lymphoid cells (ILCs if innate lymphoid cells) develop from a the only common precursor in the bone marrow identified by the transcription factor id2 CELL AND MOLECULAR IMMUNOLOGY ISSUE 8 PAG 65) this is important due to the possible variations from author to author if we understand how the defense mechanism behaves, it is much more evident and practical to understand of possible variables of title and nomenclature we begin our understanding so that it is unnecessary to memorize terms and or nomenclatures and it is fundamental to understand the functioning of the system in the approaches that evolve and need the specific immune system to get used to TH1 response to the immune system linked to viruses or be it intra-cellular pathogenic beings and TH2 to extra-cellular pathogenic beings like b harmful acts for an example (comparison between humoral-based immune response and left cell base humoral response the invading microorganism antigens react with lymphocyte surface antibodies activating these cells these activated lymphocytes proliferate and differentiate into immune memory cells and plasma cells 10 EDITION PAG256) in this quote from Junqueira and Carneiro's book we note that TH2 is being reported but ahead (Direct cell response cytotoxic T lymphocytes (cytolytic) are activated by contact with a cell that presents viral antigens in complexes with MHC molecules on the surface –(2This activation leads to the production of cytotoxic T cells of immune memory and to the appearance of cytotoxic T lymphocytes that produce perforins that break the plasmatic membrane of cells infected by the virus. This kills the virus because they can only

live inside the cell. 256) term perforates basically [2].

## 2. LITERATURE REVIEW

We will start with the progenitors of all cells called hematopoietic cells lymphoid lineage progenitor lymphoid progenitor cells Tprogenitor cells of progenitor B cells NK cells myeloid lineage eosinophils mast cells macrophage neutrophil basophil megakaryocyte erythrocyte monocyte. (Origin and activities of the main lymphocyte types. Nk lymphocytes derive directly from the bone marrow and act on the cellular immune response killing infected cells (HISTOLOGY, BASIC 10 PAG EDITION 259) Ag antigen that unfolds into (TCR T lymphocyte receptors) (BCR receptors) B lymphocytes) we will start associations (TH1 CD8 MCH-I intracellular response) MHC class I: This is expressed in practically all nucleated cells of vertebrates (TH2 CD4 MHC-II extracellular response) MHC class II: Present in cells presenting APCs macrophage lymphocytes dendritic cells, MHC class III: It is linked to proteins C4 and C2 of the complement system has no relation to tissue rejection (the task of presenting antigens associated with host cells for recognition by CD4 + and CD8 + T cells and performed by proteins specialized so-called major histocopatability complex (MHC) molecules that are expressed on the surface of hospital cells edeiras CELL AND MOLECULAR IMMUNOLOGY 8 EDITION PAG 107) epitope or determinant and the smallest fragment, ie the smallest part that is possible to be identified and generate an immunological response. we will then begin the study of in the case of injury with the breaking of barriers and a natural immune response was initiated among the cells that were disrupted in the blood and other fluids. Will be presented to a T lymphocyte in a lymph node in an analogy as if it were a headquarters the batteries we all know have a huge number of forms and behaviors say that the phagocyte is one of those that we can classify as harmful to the human being then among those processes that we mentioned earlier we will start the response (TH2 CD4 MHC-II extracellular response) then we will enter this process of antigen presentation or part of it as epitope molecular PAMPs associated with pathogens PRR (Pattern Recognition Receptors) (transmembranaceous Toll-Like [3] Receptors TLRs ), (C-type Lectin Receptors CLRs) (Nod-Like cytoplasmic Receptors NLRs, Like Receptors ALRs RIG-Like Receptors RLRs (Supramolecular Organizing Centers SMOCs) include some methodological methodologies for recognizing structural patterns of pathogens for this fragment epitope which is the minimum necessary for this evaluation to be carried out and to give sequence to the initial investigation process in the intuition if it is discovered if this fragment is this molecular structure and comes from an antigen that can multiply if reorganized and decide whether an attack on the system to the organism is worth or not in this presentation, three situations are possible the first really the antigen and or fragment of the antigen is something harmful to the organism and its proper functioning and prepared a sequence of events that we will cite to assure the other hypothesis would be that the epitope the antigen is not harmful to the organism and the situation would be solved by the System natural cell with no need for System action (Th2 CD4 MHC-II extraneous response the other situation would be that the epitope fragmanetos of the antigen or even the antigen has been specified and discarded of any harmfulness to the organism and in this case the analysis was wrong there was no part on the part of the system (Th2 CD4 MHC-II extracellular response [3] the If knowledge is needed, leaving this antigen free to trigger degenerative cellular processes in the body, that is, the disease is installed without due response. One of these factors would be due to immunosuppression that leads to structural decay in the immune system, it may be a partial inactivation in cases of exaggerated treatments of corticosteroids and other drugs that inhibit the immune system or due to the intervention of viruses such as HIV, (8 which neutralize the immune system in non-treated cases and in patients with predisposition and susceptibility to a worse diagnosis in the case of HIV, HIV and an RNA virus and converts RNA into DNA to replicate, we quote a virus at this point to justify some immunization suppression. Another case would be the immunodepressed, children under the age of two and older than 65 and other events and or diseases that may depress the immune system. Another interesting case to be written about. the immune system in this case we would quote (Th2 C D4 MHC-II extracellular response) and the (Th1 CD8 MCH-I intracellular response 4) would be reactions irrelevant to the situation as in the cases of asthma and relmatoid arthritis would be this case the mistaken recognition of a normal cell of the organism to which the immune system in this if both give it an antigenic status, the same epitopes of the organism itself after being attacked and fragmented continue to be recognized as a

pathogen and this is a case that eventually extrapolates the use of coticoid therapy, which is not always well-dimensioned, in many cases causing severe immunosuppression. immunosuppressive potential even if not the most serious ones and the STRESS factor is the syndrome of being sick to studies proving that this fact suppresses the immune system (The results of the studies have revealed that the participation in these situations alters the number and function of a great number of cells in the immune system, decreasing immunocompetence (Wang, at al) then talking again about (Th2 CD4 MHC-II extracellular response) (Th1 CD8 MCH-I intracellular response) and it is necessary that the individual is in good physical and mental health conditions so that the system immunology has an adequate immunocompetence which means the ability to read and verify in interpreting presented data if this does not occur, it will be exposed to antigens that can be potentially fatal mortal or that lead to severe debilitating reactions such as morbidities, paleness etc. or that determine disproportionate responses extremely aggressive against the organism itself in healthy cells. then we will briefly describe and few details unfortunately it was not possible to put illustrations in this work the answer [4]. (Th2 CD4 MHC-II extracellular response) activated or by mast cells and eosinophils especially in response to helminths activates the fa GATA-3 and STAT6 transcription factors that stimulate the differentiation of immature CD4 + T cells into Th2 subsets IL4 produced by Th2 cells amplifies this response and inhibits the development of TH1 and Th17 cells IMMUNOLOGY CELULAR E MOLECULAR PAG 222) (6 the description shows the role of interleukin 4 in the differentiation of T cells in this case and the key to differentiation in TH2. TH2 cells that differentiate due to the influence of IL 4 have the capacity to secrete some types of interleocins (IL -4, IL5 and IL13) to IL 4 and IL 13 are those that are involved in the B activation process lymphocytes being the activated B lymphocyte the same under structural molecular modifications and become plasmocytes. Plasma cells have the functional capacity to produce immunoglobulins I believe it is interesting to describe the structure of the immunoglobulin which is constituted by 8) a membrane receptor larger chain heavy molecules the chain smaller number of light molecules at the bifurcation junction that is formed by externally light chains and internally heavy chains and the so-called antigen binding site, we will describe the main immunoglobulins or those that science has known so far (IgG manomero 80% lymph blood, light from the intestine IgM pentamer 5- 10% surface of B lymphocytes (under manometric first antibodies produced at the beginning of the immune response IGA secretory component dimer secretory component 10-15% produced by the plasmocyte in the own blade and present as a dimer in secretions such as saliva, tears and resistant milk proteolysis protects the mucomeric IgD manomer 0, 2% located only on the surface of B lymphocytes act as antigen receptors, activating B lymphocytes IgE manomer 0.002% located on the surface of mast cells and basophils participate in the allergic processes and lysis of multicellular parasites such as worms (9BASIC HISTOLOGY PAG 257) TH2 basically manages the antigens that have extracellular action in the extra cellular medium such as bacteria and microorganisms and organisms such as helminths and a line of defense of the extra cellular medium as a specialty. taking advantage of, I will talk about the arachidonic acid cascade that has a fundamental part in the inflammatory process, the arachidonic acid and formed by the degradation of the phospholipid bilayer of the cell membrane these phospholipid structures by the action of the enzyme phosolipase A2 break the phoslipids forming lysophospholipids and arachidonic acid the arachidonic acid among other properties and pro inflammatory this inflammation is responsible for activating parts of the immune system activating substances P anxiety and activate nocicptors bringing the sensation of pain to the place where an injury occurs etc. the definition of arachidonic acid and an omega-6 fatty acid arachidonic acid jacket 9)lipooxygalysis forms leukotrienes and by the action of cyclooxygenase forms thromboxane and prostaglandins the prostaglandins constituting the constitutive physiological prostaglandins COX 1 pathological prostaglandin COX 2 is the description of the arachidonic acid cascade. Finally we will briefly and briefly describe the defense line of the TH1 immune system (Development of the Th1 A IL-12 cell produced by dendritic cells and macrophages 6)in response to the intracellular microorganisms i IFN-y produced by NK cells (all are part of the initial immune response) for microorganisms) activate the transcription factors T-bet, STAT1 and STAT4, which stimulate the differentiation of immature CD4 + cells into the TH1 subgroup IFNy produced by TH1 cells amplifies this response and inhibits the development of TH2 and TH17 cells AND MOLECULAR PAG 219) [5-12].

(7 Based on this principle that TH1 is a specialized and specific response for intracellular microorganisms, we can include viruses that, because of the virus in a simplified definition and a protein capsule with genetic information in its content, it does not have the necessary organelles to reproduce what it does obligatorily, an intracellular pathogen among these micro-organisms also includes pathological mycobacteria such as Mycobacterium tuberculosis, Mycobacterium leprae, among others that are installed if we can say so inside cells between their organelles when a cell and internally infectate is worth highlighting until the changes in some nomenclatures as a sexually transmitted disease to a sexually transmitted infection due to knowing the cause of it and what is classified as an infection (STI) when this swollen cell recognizes that we say there is something wrong there is signaling mediated by interferons the way that a cell it communicates with each other and by interferons IFN-α and IFN-β IFN-α (alpha) and β (beta),(10 produced epithelial cells and fibroblasts) (the cell infected by viruses or by mycobacteria it changes its expression of communication with the extracellular medium and the presence of these interferons and a warning signal that promotes the reaction of the TH1 IFN-γ system (gamma), is induced by cytokines such as interleukin 12 (IL-12) a brief explanation of the TH1 system the intuition of formulating the diagrammatic formula of the system taking advantage of the vogue that the COVID virus has in its strains and blood type A selection, the TH1 system has difficulties in recognizing the virus due to the molecular structure of blood type A having molecular aspects similar to that of the COVID virus, the vaccine is in oral nasal secretions and tears in healthy individuals for having molecular parts of the virus, a good treatment in cases of saguineal typing would be immunoglobulin A and intradermal vaccine application to have completed this brief study of the immune system in a diagrammatic way [4]

## 3. CONCLUSION

I conclude that this brief study, but diagrammatically, has achieved the intuition of separating parts of the human defense mechanism called the immune system and adhering to three of the main organic schemes one being a more natural or general scope the other two highly specialized TH1 and TH2 and we still have in my view many variables of these mechanisms to discover to bring to light many molecules and keys and mechanisms of the immune system mainly TH1 and TH2 remain hidden.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

## REFERENCES


1. Imunologia Celular e molecular 8 ediçao Abul K Abbas, Andrew H. Liichtman e Shiv Pllai Elsevier editora ltda; 2015.
2. Seven Seas of Rhye; 1973.
3. Histologia Basica Junqueira e Carneiro 10 ediçao 2004
4. Hunt M. (2017). Imunidade Inata. In: Microbiology and Immunology On-line, Hunt RC. editor.
5. Available:https://www.fcav.unesp.br/Home/departamentos/patologia/HELIOJOSEMONTASSIER/aula-2--antigenos-e-pamps.pdf
6. Available:https://www.arca.fiocruz.br/handle/icict/10424
7. Available:http://www.usp.br/gmab/discip/zab1304/aula13.pdf
8. Available:https://sbi.org.br/sblogi/organelas-de-sinalizacao-imune-inata-smoc-o-lego-das-respostas-imunes/
9. Available:https://www.conhecer.org.br/download/IMUNOLOGIA/leitura%20anexa%201.pdf
10. Available:http://jararaca.ufsm.br/websites/imunologia/b46d81ad56d0fa0c196d351ba7e53ed8.htm
11. Available:http://www.sbai.org.br/revistas/Vol244/citocinas.htm
12. Available:https://www.infoescola.com/sistema-imunologico/interferon/




*Peer-review history:*
*The peer review history for this paper can be accessed here:*
*http://www.sdiarticle4.com/review-history/67386*