Immunology 102- Part 2

In the book of Genesis, God created the heavens and the earth and He saw that everything was good. Creation was completed in the first six days then in Genesis 2:2, God "rested." This term "rested" can be confusing. The understanding of this term "rested" is completed or ceased. It has been naturally or secularly interpreted as the day God rested as in, He physically stopped working and took a break. Do you honestly think God was too tired to make another tree on the 7th day? I hope you answered no. As an attorney would simply state, "I rest my case," (had completed all his work, questioned all the witnesses, and all his presentation was completed). God had rested His case. On the 7th day (Sabbath), God reminded Himself of all that He created and concluded it was good.

In the last article (Immunology 101) we discussed how the authority over all illness and disease had been given back to man-kind through Christ Jesus. We discussed how the body reacts and responds to foreign agents (antigens) and how the body (host) mounts a response to neutralize and defend itself with antibodies. To continue the discussion on the Immune system, we will discover that everything has been provided and completed around 2000 years ago (plus or minus 6 days). All the key components and mechanisms were completed up to Genesis 2:2. We will discuss the second arm of Immunity known as Cell Mediated Immunity (CMI), vaccination immunity, and new Immune treatment ideas.

The humoral immune system was discussed previously and it involves fluids of the body, membranes of the body, and secretions from the linings of the body. The main difference between the two categories in Immunology is the mechanism by which the defenses occur. Humoral Immunity occurs in the bodily fluids where antibodies bind to antigens (outside the cell) and are removed. Cell Mediated Immunity (CMI) includes T Lymphocytes (Helper T cells and Cytotoxic T cells) and Macrophages. The T cells move through the Lymphatic System and are produced from the bone marrow. Under the Humoral Immune system, B cells leave the bone marrow and enter into the lymphatic system where they divide and differentiate into Plasma B cells (produce antibodies) or memory B cells. The B cells become activated when they encounter an antigen. The B cells can produce antibodies which will bind to the cell's membrane or freely "float" along in the bloodstream. When an antigen binds to the B cell's antibody, the antigen becomes neutralized. T cells are also produced in the bone marrow but mature in the Thymus. Cell Mediated Immunity occurs within infected cells and the foreign objects are destroyed by intracellular (within the cell) enzymes. More specifically, if an animal has never been exposed to a particular disease, you can receive antibodies from an individual that has been exposed to and has survived the disease (example-Hyper-Immune serum). Similarly, individuals can receive T cells (helper and cytotoxic cells from CMI) from an individual that has been exposed to and survived the same disease but is a more complex procedure. The differences in the two immune systems is that the CMI will provide longer lasting immunity and protection against recurrent infections. The Humoral Immune System is short lived (ex. Hyper-Immune Serum).

In simplifying the CMI, T cells are responsible for helping with the release of cytokines (enzymes activating the digestion of infected cells) and maximizing the bactericidal activity of Macrophages

(phagocytes). Phagocyte in Latin means "eating cells." You may have heard of T cells before as in the viral infection, HIV (Human Immunodeficiency Virus) in humans. The HIV virus infects helper T cells which produces AIDS (acquired immune deficiency syndrome), which prevents the immune system from functioning. The CMI is the true "killer" arm of the immune system. The use of helper T cells and cytotoxic (cell killers) T cells eventually kill bacteria through "Apoptosis" (cell death). Through a complex series of events, the T cells mark infected cells and activate macrophages and killer T cells to destroy bacteria through apoptosis (cell "popping"). B and T cells can also differentiate into Memory cells.

Vaccination is another term for Immunization and there are 2 forms of immunization. Passive Immunization involves the transfer of antibodies (Immunoglobulins) against infectious agents or toxins. Examples of Passive Immunity are colostrum, plasma, and serum which are involved in Failure of Passive Transmission (FPT). When deer are less than 24 hours of age, their entire immune system comes from ingesting colostrum (mother's first milk). If the doe has poor quality colostrum (sick or debilitated) or the fawn doesn't nurse in the first 24 hours, the fawn will definitely fall into the category of FPT (no immune system). This is why a super healthy doe and vaccinating late term doe is critical within the last 30-60 days of gestation. Antiserums and antitoxins can be administered to help the immune system by providing antibodies/ antitoxins to sick fawns. However, Passive Immunity is immediate but short lived (10 days) and do not produce memory cells.

Active Immunity involves "injecting" antigens into the body to stimulate an Immune response (vaccination). Active immunity has a lag period (time from exposure to functional immunity), long-lasting immune response, and has immune memory. Replicating and Non-replicating vaccines are two types of vaccines that affect the Humoral Immunity or CMI. Replicating vaccines are "live" but attenuated (reduced virulence). They are modified from the original antigen and their virulence (ability to cause disease) is reduced and the vaccine is able to replicate. These vaccines typically build a stronger immunity and last longer, but are responsible for more side effects than Non-replicating (killed) vaccines. Non-replicating vaccines are inactivated by fixatives or heat and can have adjuvants added to them to enhance immune response. Choosing the correct adjuvants for Non-replicating vaccines is critical to reduce or eliminate bad inflammatory side effects (vaccine reaction). When a company produces an effective, safe, killed, adjuvant vaccine, they often become labeled as Proprietary ("secret sauce"). A third type of vaccine is Non-Replicating Subunit vaccine. There are 4 types of subunit vaccines. These vaccines can be made from cell or plasma wall membranes from the desired antigen, inactivated microbial toxins (toxoids), recombinant DNA (a single gene is cloned into a vector), and DNA vaccines (experimental). DNA vaccines are made from naked plasmid DNA (circular DNA from virus) and involve host cells in vitro (in glass/ Laboratory). These "new DNA cells" express a desired antigen and stimulate Cell Mediated Immunity. The requirements to produce good vaccines are critical. Studies must include efficacy, safety, stability, and discrimination between vaccinated and infected animals. Vaccine testing is critical.

With current technology, Laboratories can make antibodies specific for bacteria, viruses, etc. The advantage of treatment with antibody specific treatments versus antibiotic usage is tremendous. There will be a day that an individual is diagnosed with a disease and they will be treated specifically and precisely with the antibodies to neutralize and kill the offending agent. Immune therapies are on the

way and a few are currently available. The use of Immune therapy is exciting and recovery is less damaging to the body and have pin point accuracy. Antibiotics (against life) kill and damage all cells, not just bad cells. There is more "self" damage that occurs with antibiotics. Immune therapy treatments do not damage host cells. Immune therapy is God's naturally designed therapy. Everything we need to battle disease was carefully designed by the Creator. We simply need time to stop, relax, and have a revelation of knowledge and wisdom of God's Word. "Everything has been provided already."

We are in need of Sabbath time regularly. The Sabbath is a time for us to remind ourselves of what God has accomplished and to acknowledge He is our provider. God is not simply a laborer but a provider. By getting our head out of this world and into His Kingdom, we can access God's grace through faith. We just need to slow down and reflect.

God's blessings,

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