



THE IMMUNE SYSTEM

Our personal army



Surprising to some, the amount of people getting sick, coughs and flu's in the most hygienically clean era with the highest standards of cleanliness continues to leave the alternative medicine advocates shaking their heads with the "I-told-you" look on their faces.

We have long been aware that the human body is immensely capable of destroying almost any invaders, or pathogens, that intrude the body. We have an entire system installed solely to maintain this immunity. But we often fail to realise that the optimum functioning of the body is ultimately dependant on the health of the cells in this system and that this is directly dependant on what we feed them, how well we look after them and how healthy we keep their environment.

Take nutrition for example. There are said to be over 90 essential nutrients that are needed on a daily basis and how many of these do you think we get from the foods comprising the average diet? Considering most bought foods are taken from the ground, processed, stripped of nutrients, left with empty calories and left on the shelf in *preserved* conditions. And what about healthy living and exercise? If we didn't get the blood pumping to fully oxygenate the cells or remove wastes or supply nutrients, or if we didn't provide a balanced and stress-free environment for the cells how would they be expected to remain healthy and function at peak performance?

To get a better understanding of the importance of our immune system as well as the necessity for it to be constantly performing at its best let's take a look at how many roles the immune system must play every hour of every day to keep you healthy and well.

Immunity – Protecting the throne.

Our bodies can be likened to the army of a king's castle! The ever-present need for an organized and trained protection system ready to mount a defense response at the drop of a hat is vitally pertinent.

Everyday we are exposed to Pathogens, disease-causing organisms that aim to invade our bodies and infect us. But the King is not prepared to give up his flag so easily!

The castle's protection system has several facets and lines of defense. The first line of defense being the walls of the castle. Our skin and surface membranes, including the secretions they produce are likened to the walls of the keep. This is an extremely effective physical barrier, whereby the countless attempts of invaders to our bodies are abolished at once and the number of possible attacks is significantly decreased before they even have a chance.

Upon the walls of the castle are the archers. Keratin, a protective protein, is resistant to most weak acids and bacterial toxins. This acidity of the skin stops bacterial growth before they even get through the walls. Mucous membranes also line all body cavities, including respiratory, digestive, urinary and reproductive tracts. These mucosae are sticky and trap many micro-organisms that try to enter the body, and those lining the respiratory tracts have tiny hairs to trap inhaled particles.

Lining the gates of the keep is also highly important. Every orifice of the body is protected. The stomach lining and that of the female reproductive tract are highly acidic to destroy invaders. The stomach mucosa secretes highly concentrated acids (hydrochloric acid) and protein-digesting enzymes that kill pathogens. Saliva and Lacrimal fluid, which washes external eye surfaces, contain lysozyme, an enzyme that kills bacteria.

In the case of the castle walls being breached the next line of defense is called into action. Phagocytes (phago = eat, cyte = cell), which are cells trained to eat their enemy, are sent to the front and literally engulf and destroy foreign particles. This is where the infantry mount their guard. Monocytes, white blood cells that act as soldiers patrolling the streets of the body enter into distressed tissues, enlarge and become Macrophages (big eaters). When they come into contact with debris or bacteria they engulf the substance much like the way an amoeba eats its food, by folding its own matter around the bacteria until the entire particle is within its membrane.

Then there are Natural Killer cells, which police the blood and lymphatic system. They kill by attacking the target cells' membrane, literally like stabbing it with a sword, using several cytolytic (cell-breakdown) chemicals after which its nucleus spills and disintegrates. They also facilitate the Inflammation response.

This is the next line of defense, which occurs from either injury or infection by viruses, fungi and bacteria. The inflammation response prevents the spread of damaging agents to nearby tissues, disposes of cell debris and sets the stage for repair processes. An alarm is sounded when the walls of the keep are breached and a host of chemicals are released like a patrol of cavalry into the area. Vasodilatation is the result and more blood and medical troops are rushed to the aid. With it comes a flow of clotting proteins to try to reseal where the wall was breached. This isolates the area, stops the spread and provides scaffolding for permanent repair.

As the counterattack continues, backup riders, known as Late Arrivers that turn into macrophages, continue to wage the battle replacing the foot soldiers on the battlefield. In severely infected areas, the battle takes a considerable toll on both sides, as numbers die and blood is spilled. It is seen as yellow pus that can accumulate in the wound. When severe enough the body goes into fever – a significant rise in metabolism in the body's attempt to wage the war. The hypothalamus acts as the thermostat for the body and increases the body's temperature not only in the local area but widespread so war is waged throughout the entire body.

Finally, there is the 'Immune Response'. This is when the King draws his sword. Known as 'Specific Immunity, the body remembers a past specific enemy, or Antigen, and knows the exact Antibody (inoculating protein) to destroy it. The Immune Response is a highly specific defensive response that can only occur when the attacker has been met before so the King has already learnt from experience which method best stops the invaders. A simple example is Chicken Pox, which rarely is caught twice once the body has discovered the right Antibody to defend against it. Mounting this response is expensive metabolically, and its shortcoming is that it must be primed, or have met the attacker first, to know specifically the correct response.

In all, throughout the skin, lymphatic system, blood, tissues and cells you can see how integrated our body's immune system is and how effective it can be when functioning at optimum. We need to keep in mind though what was stated earlier in that the optimum functioning of the immune system is dependent upon the health of the cells within it, and that the health of these cells is ultimately dependant upon how well we nourish, nurture and feed them. When you are stressed, tired, run down, sleep deprived, how well do you think your system will hold up in war? All you need in this weak state is the slightest bacteria in your system, and they're always around, and your army is wiped out in a single attack. On the other hand, if your system is primed, trained, healthy and strong it would take wave after wave of infectious onslaughts to penetrate and capture the king – an unlikely event for a stone castle built on healthy principles!!!

Every day we meet sickness. Everyday we need a well-functioning army to combat it.

Are you supporting your system or weakening it???