

# The Defense System

H A R U N   Y A H Y A

As acknowledged, issue that has to be given top priority by a country for the continuance of its existence. Nations have always to watch out for all kinds of internal and external threats, assaults, risks of wars and terrorist actions. This is why they allocate a great part of their official budgets to defense. Armies are provided with the most advanced aircraft, ships, and arms, and the forces of defense are always kept at the highest level of preparedness.

The human body is surrounded by a great number of enemies and threats. These enemies are bacteria, viruses, and similar microscopic organisms. They exist everywhere; in the air we inhale, the water we drink, the food we eat, and the environment in which we live.

What most people are not aware of is that the human body has an excellent army, the immune system, which fights against enemies. This is a real army made up of many "soldiers" and "officials" with different assignments, who are specially trained, employ high technology and fight with conventional and chemical weapons.

Every day, even every minute, a permanent war is fought between this army and the enemy forces, but away from our knowledge. This war can also be in the form of minor, local skirmishes as well as battles in which the whole body is involved and alarmed. We call these battles "diseases".

The general conduct of this war almost never changes. The enemy attempts to fool the other side by camouflaging itself when intruding into the body. The trained investigative forces are assigned by the defense to identify the enemies. The enemies are identified and appropriate weapons are produced to exterminate them. Then there is close contact, the defeat of the enemy, cease-fire, and clearance of the battleground. Last, there is storage of every type of information about the enemy as a precaution against the possibility of a later attack....

Now let us examine this interesting war closer.

## THE BESIEGED CASTLE: THE HUMAN BODY

We can liken the human body to a castle besieged by enemies. The enemies look for various ways to invade this castle. The human skin is the wall of this castle.

The substance of keratin in the cells of the skin is an impassable barrier for bacteria and fungi. Foreign substances that reach the skin cannot pass through this wall. Moreover, although the outer layer of skin that contains keratin is continuously rubbed off, it is renewed by skin growing from beneath. Thus, all unwanted guests that have squeezed between the skin are ejected from the body together with dead skins, during renewal of the skin from inwards to outwards. The enemy can only make its way in through a wound that is inflicted on the skin.

## THE FRONT LINE

One of the ways through which viruses enter the body is air. The enemy pushes its way to the body through the air inhaled. However, a special secretion in the nasal mucous membrane and cell-swallowing defense elements in the lungs (phagocytes) meet these enemies and take control of the situation before the danger grows. Digestive enzymes in the stomach acid and small intestine eliminate a great number of the microbes that seek to enter the body through food.

## THE CLASH OF THE ENEMIES

There are some microbes that have settled in various parts of the human body (such as skin, skin folds, mouth, nose, eye, upper respiratory canals, digestive canal, the genitals) yet do not cause illness.

When a foreign microbe enters the body, these domestic microbes - thinking that their habitation would be invaded- and

not wishing to give way to the foreigners who invade their habitation - fight strenuously. We can define them as professional soldiers. They try to protect their territory for their own ends. Thus, the complex army in our body is reinforced by these micro supports.

## **STEP BY STEP TO HOT WAR**

If a microscopic intruder entering the body can overcome defense elements on guard and bacteria serving as soldiers, it causes war to begin with. After that, the body, with its ordered army, fights a perfect offence-defense war against this foreign army.

The war fought by the defense system is comprised of four parts:

1. Identification of the enemy.
2. The fortification of defenses and the preparation of offensive weapons.
3. Attack and battle.
4. Retreat to normal state.

The cells that first meet the enemy units are macrophage cells that make "phagocytosis", i.e., that engulf the enemy. These cells are involved in close contact with the enemy, and fight a hand-to-hand war. They are just like infantrymen who fight a bayonet war against enemy units and struggle at the distant front line of the army.

Moreover, macrophages function as intelligence units, or as the secret service of an army. They hold one portion of the enemy they destroy. This portion is used to identify the enemy's identity and to determine its features. Macrophages pass this portion to another intelligence unit, messenger-T cells.

## **GENERAL ALARM**

When a country is involved in war, a general mobilization is declared. Most of the natural resources and the budget are spent on war expenses. The economy is re-arranged according to this extraordinary situation and the country is involved in total action. In a war, which the defensive army of the body will fight as a whole, mobilization is also declared. Do you wonder how?

If the enemy is more than they can handle, the cavalcades (macrophages) that launch an attack secrete a special substance. The name of this substance is "pyrogen" and it is a kind of alarm call. After travelling a long way, "pyrogen" reaches the brain and stimulates the fever-increasing centre of the brain. Following this stimulation, the brain sets off alarms in the body and the person develops a high fever. The patient with a high fever naturally feels a need to rest. Thus, the energy needed by the defense army is not spent elsewhere. As seen, there exists an extremely complex plan and design at work.

## **THE ORDERED ARMY SWINGS INTO ACTION**

The war between the microscopic intruder and the immune system becomes more complicated after mobilization, that is, your falling ill in bed. At this stage, infantrymen (phagocytes) and cavalymen (macrophages) have proved insufficient, the whole body is alarmed, and the war becomes heated. At this stage, lymphocytes - (T and B cells) - intervene.

Cavalrymen (macrophages) pass the information they have on the enemy to T helper cells. These cells summon T cytotoxic and B cells to the battleground. These are the most effective fighters of the immune system.

## **WEAPONRY PRODUCTION**

As soon as B cells receive information about the enemy, they start producing weapons. These weapons, just like ballistic missiles, are only produced to hit the enemy on whom information is available. This production is so perfect that the three dimensional structure of the microscopic intruder and the three dimensional structure of the weapon fully match each other. This accord is like that between a key and its lock.

Antibodies advance towards the enemy and clamp tightly on it. After this stage, the enemy is neutralized like a tank that has its treads, cannon and gun destroyed. Afterwards, other members of the immune system come and eliminate the neutralized enemy.

Here, there is a very important point to consider: there are millions of types of enemy that the immune system will confront. B cells can produce an appropriate weapon for all types of enemy no matter what they are. This means that the immune system innately has the knowledge and capability to produce the keys appropriate to millions of different types of locks. These unconscious cells have the ability to make millions of types of antibodies, and their using it in the best way proves the existence of a creation by the Owner of an exalted power.

Furthermore, the system is more sophisticated. As B cells destroy the enemy with ballistic weapons, T cytotoxic cells also fight a tough war against the enemy. When some viruses enter a cell, they can hide from the weapons produced by the B cells. The T cytotoxic cells find the diseased cells in which this camouflaged enemy hides and destroy them.

## **AFTER THE VICTORY**

After the enemy is defeated, the T suppressor cells swing into action. These cells give the army of defense the command to cease fire, and cause the T cytotoxic and B cells to stop their activities. Thus, the body does not carry on in a state of mobilization in vain. After the war is over, most of the T and B cells produced specifically for the war complete their lifecycle and die. This tough war, however, is not to be forgotten. Before the war, a short time passed while the enemy was identified and the necessary preparations made. If the enemy ever comes back, the body will be much better prepared. A group of memory cells, which have come to know the features of the enemy, will constantly serve in the immune system in future. In a possible second attack, the immune system, with the information in the memory cells, will have the means to react before the enemy gains force. The reason why we do not catch mumps or measles again, after we have once caught them, is because of the memory of our immune system.

## **WHO IS HE WHO CREATES THE SYSTEM?**

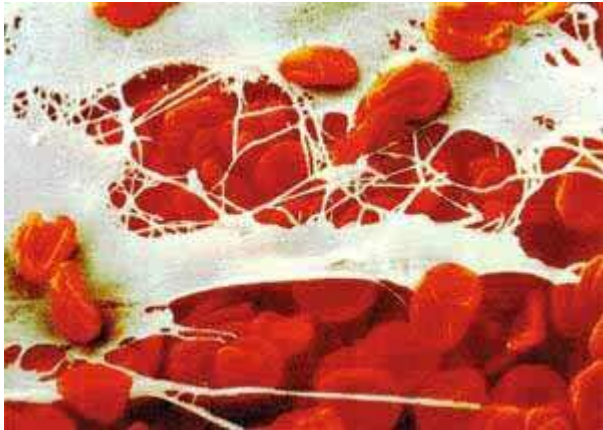
After all the information we have examined, we have to take our time and think about how this perfect immune system to which we owe our lives has come to exist. There is a flawless plan at work. Everything needed for the operation of this plan is intact: macrophages, the pyrogen substance, the fever raising centre of the brain, the body's fever raising mechanisms, B cells, T cells, weapons... How, then, has this perfect system come into being?

Not surprisingly, the theory of evolution, which proposes that living beings have come into being by coincidence, cannot explain how this complex system came about. The claim of the theory of evolution is that living beings and living systems have originated step-by-step by the accumulation of little coincidences. However, the immune system cannot by any means have originated "step-by-step". The reason is that in the case of the absence or malfunction of even one of the factors that make up the system, the system cannot work and the person could not survive. The system must have come into being completely and flawlessly with all its components intact. This reality renders the notion of "coincidence" meaningless.

Who, then, makes this plan? Who knows that the body's fever must rise, and that only that way the energy needed by the army of defense will not be spent elsewhere? Is it the macrophages? Macrophages are merely tiny cells. They do not have the capacity to think. They are living organisms that obey an established superior order and that fulfill their duties.

Is it man? Certainly not. People are not even aware that such a perfect system is at work in their own bodies. However, this system, of which we are unaware, protects us from certain death.

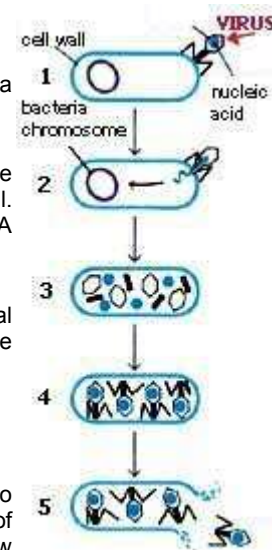
It is obvious that the one who created the immune system, and who created the whole human body, should be a Creator Who has exalted knowledge and might. This Creator is Allah, Who has created the human body from a "drop of fluid".



The front defense line of the body is the skin. When a cut or wound is inflicted on the skin, it means that the body is in danger. Viruses and bacteria can easily make their way through. When such a wound is inflicted, "virus- and bacteria-hostile" cells called "phagocytes", rush to the afflicted spot and try to swallow the micro-organisms that intrude into the body. On the other hand, the wound on the skin has long since started to receive treatment to prevent further foreign materials from entering the body.

## "THE CELL INVASION" OPERATION OF THE VIRUS

1. Virus contacts the cell it approaches and adheres to its surface. (It is seen on a bacteria cell in the scheme).
2. The virus discharges a special enzyme at the point of contact that will help melt the membrane of the cell it approaches. Because of this action, a hole forms in the cell wall. The virus pulls back its tail and, by shrinking, it injects the nucleic acid in its body (DNA or RNA) into the cell.
3. The nucleic acid of the virus that enters in the cell takes it under control. The vital functions of the cell stop. The nucleic acid of the virus self-replicates by using the resources of the cell.
4. The newly formed parts of the virus come together and form new viruses.
5. When sufficient viruses are formed, the cell bursts and developed viruses swing into action to find new host cells. The time from the virus' intrusion into a cell to the end of its reproduction is around 20-25 minutes. At the end of each replication, 200-300 new viruses are formed in a host cell.



Macrophages are those elements of the immune system that fight at the front. They engulf and digest all kinds of foreign substances in the blood. Their other task is to call the T cells for help wherever they meet the enemy. In the photograph on the left, a

macrophage is seen trying to catch a bacterium with its extensions. On the right, the macrophage is trying to engulf a lipid molecule that has entered the body.

## THE IMMUNE SYSTEM

The leucocytes, around a trillion in number, form a highly specialized army of defense. The most important agents of this army and the duties they perform during a war with the enemy are described below.

### The

### Virus

The virus, a genetic data package, is dependent on the environment to be activated. It has to use the mechanisms of a host cell in order to reproduce.

### The

### Macrophage

It is a watchman and the defense cell in the front line. It engulfs and digests all kinds of foreign materials in the blood. When it runs into a microscopic intruder, it summons up T helper cells to the site of action.

### The

### T

### Helper

### Cell

It is the administrator of the immune system. After identifying the enemy, it goes to the spleen and lymphatic glands and warns other cells to fight against the agent of disease.

### T

### Cytotoxic

### Cells

Warned by the T helper cell, these cells destroy the cells that are occupied by foreign materials and cancer cells.

### The

### B

### Cell

These cells, considered as biological weapon factories, are found in the spleen and the lymphatic glands. When warned by T helper cells, they produce strong chemical weapons named antibodies.

### Antibodies

This protein in the shape of a "Y" sticks onto the disease agent, renders it ineffective and turns it into a target for killer cells.

### The

### T

### Suppressor

### Cells

This third type of the T cells slows the activities of the T and B cells or stops them. It ends the assault after the illness has been overcome.

### The

### Memory

### Cell

This defense cell is formed after the first disease is over. By remaining in the body for years, it ensures that the immunity mechanism is activated very rapidly and effectively when the body meets an agent of the same disease again.

## 1)THE WAR BEGINS

When viruses are disseminated in the body, some of them are engulfed by the macrophages. Macrophages split the antibodies off the virus and stick them onto their own surface. Very few out of millions of T helper cells traveling in the circulatory system have the ability to "read" this specific antibody. These particular T cells which stick on the macrophage become active.

## 2)DEFENSE CELLS INCREASE

When T helper cells are activated, they tend to increase. They then warn the T cytotoxic cells and B cells, which are few in number and sensitive towards the enemy virus. While the number of B cells increases, the T helper cells give them the signal to produce antibodies.

## 3)THE DEFEAT OF THE DISEASE

Meanwhile, some of the viruses have entered the cells. Viruses can only replicate within a cell. With the chemical materials they secrete, T cytotoxic cells cause the death of these cells by drilling through their membranes, thus preventing the virus in the cell from reproducing. By holding onto the surface of the virus, antibodies neutralise it,

prevent it from entering the cells and start chemical reactions that will destroy the invaded cells.

#### **4)AFTER THE WAR**

After the disease is won, T suppressor cells stop the whole offensive system. Memory-T and B cells remain in the blood and lymphatic system in order to become immediately activated in case a virus of the same type is met.

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**TAKEN FROM "*FOR MEN OF UNDERSTANDING*"  
BY HARUN YAHYA, TA-HA PUBLISHERS, UNITED KINGDOM, 1999**