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The Immune System – how it works and how you support it

The Immune System of our dogs' bodies is extremely complex, and very far from easy to fully comprehend, even for the best educated scientists - nobody actually does! However, when you understand at least the main principles of the way it functions, you can make significantly better decisions in the overall health care for your dog. The following guide is no attempt to be scientifically "correct", but it will serve you as a valid reference model for making some of the crucial decisions you cannot leave for your vet to make...

"Law and order" for the body

The Immune System is a common denominator for a lot of processes that all work together for the purpose of keeping the body well functioning, by spotting trouble makers, fighting them, destroying them, and disposing of the remains of them. It plays a role for the body that is similar to what Police does in our society. Although all cells in the body are genetically programmed to work nicely together, they are better at doing this when their performance actually gets controlled – and, in the case of foreign invaders that do not respect the rules, the body's many organs truly appreciate help getting them eliminated, so they can continue *their* important work for the body.

There are many organs that contribute specific processes to this: the liver, the kidneys, the bone marrow, the vascular system, the lymph system, the hypothalamus, the thyroid – just to mention a few. All of those are "the back office" and the "volunteers". The "police officers" on active duty are the white blood cells. They carry weapons and can kill invaders and lawbreakers, and they are on constant patrol.

As long as everything is fine and no criminals "on the streets", the body functions well, and the "police officers" do their regular patrols in peace, without being noticed much.

But when a foreign bandit arrives in the form of a virus, a bacterium, or another parasite that does not respect the body's laws and the genetic code for co-operation among all cells in the body, then the alarm bells sound!

How an immune response works

First thing for the Immune System to do when a problem is discovered is to find out what exactly the problem is – and who causes it. The alarm will, in the first place, only be a "911 call" from a troubled organ or part of the body.

The first thing will normally be that the body sends extra blood to the spot (more police) and increases the temperature of the area (which makes all chemistry go faster).

Then an investigation is done. The "police" on the "crime scene" will make notes about what the problems are and who is causing them. This is then reported back to "the office" – and a plan of serious action is then made, based on the collected information. There is some time involved in this. The body needs to know what to do – all possible forces to deploy are set in preparedness for assault, and the body "gears up" for warfare...

When the plans are ready and confirmed by "head office", the execution takes place. All the necessary forces are mobilized and directed to the troubled spot – but sometimes this will now be *the entire body* (virus infections often travel so fast in the body that they are "all over the place" before anyone figures out what is going on....).

The deployed forces will include

- "Extra armed forces" (lots of white blood cells to fight the invaders)
- Elevated temperature (helps move things faster)
- Increased production of organs that provide antibodies to neutralize the poisons left by the invaders
- Increased activity of the liver to destroy the remains of the killed invaders and their junk and poisonous waste products after neutralization
- Increased activity of the kidneys to dispose of the waste products from the liver
- Increased productivity of the blood system and the lymph system to bring things quickly from one spot to another.

The time it takes to win this battle will vary. It depends a lot on how much head-time the infection got before the defense was effective and had all "weapons" coordinated in the battle. It also depends on what kind of experience the forces have with this kind of invasion. It further depends on how much support the "combat forces" can get from the body, in the form of chemical and biological supplies needed ("ammunition"). And it certainly also depends on the level of training the forces have obtained prior to this....

Obtaining auto-immunity

Let's assume that the body was successful fighting the disease, so life goes on. One of the strongest assets the Immune System has is its *ability to learn*.... Now, first time a certain disease arrives, it might take the body some time to get a defense organized well. But the records are being kept on file. Next time the same culprit shows up, no time is wasted on making plans for the counterattack – the old plans are simply pulled out instantly, and the mobilization of a full-fledged defense takes on a fraction of the time it took the first time. Most often, the invading disease doesn't even get a chance to disperse itself into the body – it gets destroyed at the entrance, immediately it is recognized!

This might all go so fast that the body does not even need to mobilize all the defenses, such as elevated temperature and other symptoms of a disease being fought – simply because the advanced defense now is so strong and so fast that it isn't necessary! When this happens, we will not notice that a disease attacked the dog – the dog has developed auto-immunity to that particular disease and will never be bothered by it again.

Measuring titers

One of the ways an auto-immunity manifests itself is through the presence of titers. Titers are a form of "anti-bodies". For each disease, the Immune System develops very specific titers, and they are generally kept on guard long after the disease is eliminated. Just to be sure....

Titers are relatively easy to measure. You can get a blood sample drawn and have it analyzed for titers for all the common diseases. If the titers are present, you can be sure that your dog has developed immunity against that particular disease – and it can never attack the dog again.

But the titers don't stay on guard forever. Typically, in some months, they get destroyed, and the body does not replenish them.

Until another attack is detected, that is! But then, it goes very fast. New titers are produced again extremely quickly because all the production plans and resources are ready – generally also so quickly that they will be deployed in the advanced defense before the body is getting alarmed. Again, the effect will be that body will not experience getting sick. The Immune System took care of that, based on the experience from the first successful battle with this disease.

But this is an area where you might get fooled... When there are no titers present in the blood, we cannot measure that the Immune System is still prepared for a fast and effective response to an invasion of disease! This is, however, not the same as the dog not being protected! You just cannot *measure* the protection... but it is still there.

It does not take much to get the titers back in the blood. The slightest exposure to the disease will ring the alarm and start an instant production. All it takes is letting your dog walk in an area where another dog has walked that was recently vaccinated against that disease.

Training the Immune System

Just as well as the Immune System will learn to respond to one given disease, it will also learn from one disease to the next. For every time it has been challenged, it will improve its performance when fighting the next disease. In other words: Its ability, in general, to fight disease get better and better, the more it fights diseases! And the bad news: it will deteriorate to plain inefficiency and sloppiness if it never gets any chances to train....

The consequence of this is obvious, but generally not understood: *you do not protect your dog from disease by keeping it in a sterile environment.* But you protect it by

letting it get exposure to diseases, one at a time, so it can learn to fight diseases well. Hopefully, you will have lots of chances training it first on fairly harmless diseases. When you can do that, it will have a much greater chance of fighting effectively also when a dangerous disease arrives.

Special rules for puppies

Puppies can, by nature, not have much experience using their Immune System. You would expect them to be very vulnerable. But it is not as bad as you might think – the mother takes care of that!

By sucking the mother milk, they get all the protection their mother has. The mother milk is full of antibodies and other “goodies” that will keep the puppy very well prepared in case of an infection! This passive protection from the mother milk is in fact so effective that Mother Nature does not bother calling the puppy’s Immune System to action until it is 10-12 weeks old. Till then, it plays a very passive role, totally relying on the protection from the mother milk. But that’s also the time when the puppy naturally will be weaned and start eating “real food”. Beautifully coordinated, through 15 millions years of evolution....

Supporting the Immune System

Now you understand how the Immune System works, it is also very simple to see what you need to do in order to support it:

- Feed nutritious food that contains *all* the ingredients that are needed for all the body’s many processes; the *only* possible way of doing this is by feeding a natural diet...
- Don’t give the Immune System unnecessary challenges through poisoning with medication, chemicals, or foreign substances that will stress it instead of supporting it;
- Train it well by giving it adequate challenges to develop its skills on, by exposing the dog to a natural environment that is *not* sterile.

The only problem left is that some diseases are too dangerous to use for “training”. For those, you would like to consider vaccination. But please check [this overview of articles on vaccines and vaccination](#) before you do that....

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