The Best Anti-Inflammatory and Anti-Tumor Eating Plan

A certain gene in cats, dogs and horses - the CD33 gene - controls inflammation, and more CD33 genes can mean a longer, healthier life. While you can't do anything about the number of these genes your pet is born with, there's plenty you can do to help at mealtime.

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- Research suggests that the number of anti-inflammatory genes an animal species possesses influences the lifespan of that species
- Example: Mice have 5 copies of anti-inflammatory gene CD33rSIGLEC and an average lifespan of 2 years, whereas humans have 14 copies of the gene and live into their 80s and beyond
- Chronic inflammation is a marker for aging and serious diseases, including cancer
- The CD33rSIGLEC gene controls the amount of inflammation produced by the body's immune system response to infection or injury, which prevents unnecessary damage to normal tissues

Research suggests that the number of inflammation-fighting genes an animal possesses may determine how long he lives. A 2015 University of California, San Diego study looked at 12 different mammal species, including mice and humans, and discovered that animals with more copies of a gene called CD33rSIGLEC (aka CD33), an anti-inflammatory gene, have longer life spans.[1]

The study involved breeding a population of mice with fewer copies of CD33. The mice with one less CD33 gene who experienced inflammation early in life developed prematurely gray hair, disorientation, and thin skin, had higher levels of reactive oxygen species (oxidants), and did not live as long as normal mice. According to Dr. Ajit Varki of the UC San Diego School of Medicine and co-leader of the study:

> *"Though not quite definitive, this finding is provocative. As far as we know, it's the first time life span has been correlated with simple gene copy number."*[2]

The Good and Bad of the Inflammatory Response

Inflammation occurs when bacteria, viruses, toxins or some other form of trauma attacks the tissues of your pet's body. When the **immune system** releases chemicals to fight infection or repair tissue, it causes blood vessels to leak, creating the redness and swelling associated with inflammation.

Normal inflammation triggered by the immune system is a healthy response of the body's natural defense mechanism. However, when there is a prolonged immune system response that results in chronic inflammation, it can be damaging and even life threatening for your pet.

Chronic inflammation can be the result of many things, including **food sensitivities** or a self-destructive attack of the body on itself (immune-mediated or autoimmune disease). Long-term inflammatory activity can result in a whole host of disorders, including cancer.

Higher Numbers of Anti-Inflammatory Genes = Longer Lifespans

Since chronic inflammation is linked to aging, and since countless drugs to treat chronic diseases work by reducing inflammation, the UC San Diego researchers wanted to see if CD33 genes are associated with longevity. These genes play a critical role in reducing inflammation after the initial immune system response to a pathogen or injury.

The original Latin meaning of inflammation is "to set on fire." Pascal Gagneux, of UC San Diego and co-leader of the study with Varki, told Live Science, "You don't want to burn down the whole neighborhood to kill one bad guy."[3]

The job of the CD33 genes is to control the "fire" (inflammation) so that the immune system response doesn't cause unnecessary damage to healthy tissues. In theory, the more CD33 genes there are in the body, the longer that body may live.

The CD33 genes place sugar molecules on many of the cells of the body, and the molecules signal the immune system not to attack the cells, which controls inflammation. The average mouse has 5 copies of the CD33 gene; the average human has 14. The normal lifespan of mice is about 2 years; humans often live to 80 or even 100 years of age.

Anti-Inflammatory Genes May Help Manage Physiological Stress

The researchers observed that the link between a higher number of CD33 genes and a longer lifespan occurred with a number of different mammal species, including cats, dogs, rats, opossums, marmosets, pigs, cows, the rhesus macaque, orangutans, chimpanzees, horses, and elephants.

The researchers speculate that CD33 genes developed in mammals to help manage the physiological stress created by the inflammatory process, which in turn limits molecular damage and extends longevity.

However, the researchers still face a "which came first, the chicken or the egg" puzzle. Which came first ... the CD33 longevity genes? Or did long-lived mammals develop more of the genes to equip themselves to fight a longer lifetime of inflammatory responses?

According to study authors, CD33 genes alone don't explain humans' extremely long lives. Like us, elephants also have 10 copies of the gene, but they don't live past 65. The researchers theorize that CD33 genes can extend life into the 60s, but another or other mechanisms must be involved that prolong human life into very old age.[4]

Feeding Your Pet to Prevent or Control Inflammation

In cats and dogs (and humans), anything that creates or promotes inflammation increases the risk for serious disease, including cancer. In fact, research points to cancer as a chronic inflammatory disease.

And while there's nothing you can do about the number of anti-inflammatory genes your pet is born with, there is one important way you can help control inflammation in your four-legged companion, and that's through the **diet** you feed him or her.

A major contributor to inflammatory conditions is a diet too high in omega-6 fatty acids and too low in **omega-3s**. Omega-6s increase inflammation, cell proliferation and blood clotting, while the omega-3s do the reverse.

Unfortunately, the typical processed western diets for both humans and their pets are overloaded with omega-6 fatty acids and deficient in omega-3s. The best diet, for example, to prevent cancer, is one that provides the nutritional components required to maintain healthy cells and repair unhealthy ones.

Cancer cells need the glucose in carbohydrates to grow and proliferate. If you limit or eliminate that energy source, you do the same with the cancer's growth. That's one of the reasons I always discourage feeding diets high in carbohydrates — carbs are pro-inflammatory nutrients.

The carbs you want to keep out of your pet's diet include processed grains, fruits with fructose, and starchy vegetables like potatoes. All dry pet food contains some form of starch (it's not possible to create kibble without it), which is one of the reasons I'm not a fan of dry pet food.

Cancer cells generally can't use dietary fats for energy, so appropriate amounts of good quality fats are nutritionally healthy for dogs and cats.

A healthy, species-specific diet for dogs and cats, one that is anti-inflammatory and anti-cancer, consists of real, whole foods, preferably raw or gently cooked, organic, and non-GMO, and includes:

- High in high-quality, lean protein, including muscle meat, organs, and bone (protein should make up 75% of a healthy dog's diet, and 88% of a cat's diet)
- Moderate levels of animal fat
- High levels of EPA and DHA (omega-3 fatty acids)
- 12% - 25% roughage (low glycemic veggies and a small amount of fruit, pureed)
- A few beneficial additions like probiotics, digestive enzymes, and super green foods
- Specific whole food add-ins, or specific amounts of vitamins/minerals that meet the additional E, zinc, iron, copper, manganese, iodine and vitamin D deficiencies found in most homemade diets (amounts to add based on what the diet doesn't provide)
- High moisture content

Sources and References

[1] eLife 2015;4:e06184

[2,3] Live Science April 7, 2015

[4] ScienceNews April 7, 2015