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## ALL ABOUT SUPPLEMENTS

### Indole-3-Carbinol

#### I3C May Reverse Autoimmunity and Extend Life Span

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One of the clues about what causes aging is that older animals develop autoimmunity, a condition whereby the body becomes allergic to its own cells and starts killing them off. “Auto” means self; immunity is a killing process. Autoimmunity, or self-killing, is not desirable.

The development of “autoantibodies,” or self-antibodies, can be induced in older animals by giving them a vaccine. A younger animal will react to a vaccination by producing beneficial antibodies. An older animal, however, reacts by producing antibodies against the infective agent as well as autoantibodies against its own body.<sup>1</sup> Antibodies are somewhat like heat-seeking missiles in that they target things with specific characteristics. In this case, antibodies target proteins, or pieces of them. If the protein happens to be part of the body, that part of the body will be destroyed. Rheumatoid arthritis is a classic example of the autoimmune destruction of a body part.



Inflammation is one of the side effects of autoimmunity. Not necessarily felt or seen, it is there nonetheless, lurking behind every major killer disease, including cancer. Inflammation is something that normally comes and goes very quickly. The immune system launches an attack, the interloper is destroyed, and the immune response subsides, taking inflammation along with it. Autoantibodies, however, provoke a chronic inflammatory response because their focus is the body’s own proteins, which are, essentially, there to stay. A constant battle ensues. If the battle is localized to the joints, doctors call it “arthritis”; if it is in the kidneys, it is called “nephritis”; and so on. The human body can even make autoantibodies to cholesterol.<sup>2</sup>

The usual treatment for inflammatory disease is to suppress the immune system. This approach works, but it has a price—side effects. It is better to get at the cause itself. If that could be done, it would not only alleviate suffering from autoimmune diseases, but also could stop the ripple effect, and might help extend life span.

Researchers from the Albert Einstein College of Medicine of Yeshiva University and other universities recently conducted a study of autoimmune mice. The mice were given normal, dietary amounts of indole-3-carbinol (I3C), a plant compound from cruciferous vegetables such as broccoli and cauliflower.<sup>3</sup> The mice used in the study usually get fatal kidney autoimmune disease within months.

As reported in the *Journal of Nutrition*, one year into the study it was clear that I3C had a significant protective effect against autoimmunity. Tests showed that the supplement drastically reduced autoimmune kidney disease. All of the animals receiving the supplement were still alive, compared to only 30% of the controls. Two months later, all of the controls were dead, while many of the I3C-fed mice survived another six months, and a few of them survived for more than 20 months—almost 50% longer than the control mice.



It is interesting to note that another study conducted several years ago showed that caloric restriction could do the same thing in autoimmune mice.<sup>4</sup> Caloric restriction reversed autoimmunity and extended life span. The fact that two different “treatments”—I3C and caloric restriction—have the same effect provokes a question. Recently it was shown that the supplement resveratrol can mimic the effects of caloric restriction and extend life span.<sup>5</sup> Might I3C also mimic some of the effects of caloric restriction, as both are able to extend life span? The answer is not known, but it is interesting to note that both I3C and caloric restriction affect a process known as “methylation.”<sup>6-9</sup> Methylation is a biochemical reaction that occurs naturally in the body. It can lead to many different things, but what is important is that it decreases with age, is disrupted in autoimmunity, and both I3C and caloric restriction modulate it.<sup>10,11</sup>

While a study has been conducted on humans with autoimmune disease (lupus) treated with I3C, it does not tell us much about I3C’s potential impact on longevity in people.<sup>12</sup> In the study, I3C had a great effect on downgrading estrogen, but was weak against autoimmunity itself. Steroids may have interfered with I3C’s potential effects, and the study was too short to draw any conclusions about long-term effects.

So the question remains: by ameliorating autoimmunity, could I3C increase longevity in humans? Time will tell. Meanwhile, consider that rodents who took their I3C supplements were scurrying around in a laboratory in New York at the equivalent of 120 human years.

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