



## Brain Maintenance: Out with the Old, in with the New!

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What if we could slow the process of cellular aging and even reverse it, at least partially? What if we could eliminate older, malfunctioning cells anywhere in our bodies—including our brains—more efficiently, and then stimulate the growth of new, young replacement cells, which could in turn become older more slowly, and be more efficiently removed when their “time has come”? Chances are good we’d all live healthier and for longer, too.

### Carnosine: Reversing Senescence

What’s “cellular “senescence”? We all know that “senile” in humans means not just getting older, but becoming less functional both mentally and physically. We’ve also been aware, likely from childhood, that all of our body’s cells are completely replaced over time, some (such as skin) relatively rapidly, and others (such as bone) much more slowly. So what’s new about cells getting older, developing into “senile cells”? What researchers have found—but has been little publicized—is that senile cells which haven’t yet undergone “lysis” (scientese for “dying off”) actually cause trouble for all of the other cells in the same tissue—new cells, young cells, middle aged cells—by initiating and maintaining varying degrees of inflammation. The inflammation caused by senile cells is strong enough to interfere (sometimes a little, sometimes a lot) with normal function of the still healthy cells in that tissue, and the inflammation caused by senile cells continues until the senile cells are gone.

In 1994, researchers reported<sup>[1]</sup> that carnosine—an entirely natural, two-amino-acid (“dipeptide”) molecule found only in animal proteins—can slow a cell’s progression into “senescence,” and sometimes actually reverse senescent cells back to a non-senescent state. In either circumstance, inflammation throughout the tissue containing these cells was substantially reduced. In 2000, other researchers<sup>[2]</sup> agreed, writing: “...carnosine appears to be able to extend the lifespan of cultured cells, rejuvenate senescent cells...”

Despite the title of the article, which described carnosine as a “drug,” carnosine is entirely natural, and has no known adverse effects. And of course since carnosine can both slow the progress of cellular senescence and reverse it, too, it’s very likely to be health and longevity promoting, as noted in a 2015 research review,<sup>[3]</sup> which stated: “...there is evidence that carnosine can enhance cortisol metabolism, suppress telomere shortening, and exert anti-aging activity... Dietary supplementation with carnosine has been shown to suppress stress in animals, and improve behavior, cognition, and well being in human ‘subjects’. It is therefore proposed that the therapeutic potential of carnosine dietary supplementation towards stress-related and depressive disorders should be examined.”

### Quercetin: Reversing Senescence, and Senolytic, Too!

Quercetin is a flavonoid present in onions, citrus, green tea, berries, apples, buckwheat and sage tea, parsley, blueberries, blackberries, and other fruits and vegetables. Like carnosine, quercetin also can slow a cell’s progression into “senescence,” and sometimes actually reverse senescent cells back to a non-senescent state. And it can do more, helping to eliminate senescent cells altogether (“lysis”), removing entirely their pro-inflammatory effects in surrounding tissues. The researchers wrote: “...delaying senescence or even promoting death of...senescent cells is proposed as a strategy to prevent age-related diseases.”<sup>[4]</sup>

The evidence that removing senescent cells is good for human health is so strong that patent medicine companies are of course trying to make “analogs” (un-natural but patentable and highly profitable “knock-offs” of natural molecules, with of course inevitable adverse effects) to the safe, effective, and relatively inexpensive senolytics present in Nature and human bodies for hundreds of thousands of years. One report tells us: “Programs in universities and pharmaceutical laboratories around the world are racing to develop senolytic drugs...”[5] As we all know, any unNatural “analog” will have adverse effects, but of course be very profitable.

### **Lithium: Making New Brain Cells at Any Age**

In medical school (which in my case—according to our children—was in the “Dark Ages”) we were told that we have all the brain cells we’re going to have for a lifetime by the time we’ve become adults. From then on (we were told) brain capacity would decline, more rapidly as time passed. One professor told the class “you can always tell a 90-year-old with an X-ray of the skull, the brain is always significantly smaller than a young adult’s brain.”

Most readers are well aware that research has by now proven that forming new brain cells is possible at any age. This awareness was triggered in the year 2000 by a publication in *The Lancet*, a major British medical journal, whose title announced: “*Lithium induced increase in human grey matter.*”[6] Low-dose lithium is now available everywhere supplements are sold. That year-2000 report stimulated me to check into low dose lithium safety, and then start using it myself, as being able to stimulate new brain cell growth appeared a very good idea, and perhaps might promote healthy longevity, a year-2000 guess confirmed in 2011 when one of dozens of lithium research reports told us that in a study of 1,206,174 individuals, the more lithium naturally occurring in drinking water, the longer the lifespan.[7]

Other brain-health promoting effects of lithium include protecting brain cells against nearly every toxin, stimulating mitochondrial metabolism in brain cells, repairing brain signaling pathways, reduction in mental health hospital admissions, reduction of aggressive behavior in children...the list of beneficial effects of lithium elsewhere in the body is much, much, much longer. But back to “in with the new cells” in our brains.

### **Taurine Helps Make New Brain Cells, Too!**

In our brains, taurine (an amino acid) has been found to stimulate growth and proliferation of neural stem cells, the precursor cells that “morph” into nerve cells. One study[8] reported: “Taurine...increased the number of human neural precursor cells in culture...The taurine-induced increase ranged from 57 to 188% in the 3 [fetal] brains examined. Taurine significantly enhanced the percentage of neurons formed from human neuronal precursor cells...with increases ranging from 172 to 480% over controls without taurine. Taurine also increased the cell number and neuronal generation in cultures of [an] immortalized human cell line. These results suggest that taurine has a positive influence on human neuronal precursor cell growth and neuronal formation.”

Working with aging mice, researchers reported[9]: “We found that taurine increased cell proliferation in the dentate gyrus [an area of the brain involved in memory formation] through the activation of quiescent [inactive] stem cells, resulting in increased number of stem cells and...neural progenitors. Taurine had a direct effect on stem/progenitor cells proliferation...Furthermore, taurine increased the survival of newborn neurons, resulting in a net increase in adult neurogenesis. Together, these results show that taurine increases several steps of adult neurogenesis and supports a beneficial role of taurine on hippocampal neurogenesis in the context of brain aging.”

### **ReMIND**

From time to time, I put together a combination of nutrients that research and/or clinical experience shows is useful for our health. A combination of carnosine, quercetin, lithium and taurine is now available as a supplement named (for hopefully obvious reasons) “ReMind.” It’s available from natural food stores, compounding pharmacies, and the Tahoma Clinic Dispensary, [www.tahomadispensary.com](http://www.tahomadispensary.com), 1-888-893-6878. And yes, I am using that combination myself!

[1] McFarland GA, Holliday R. *Retardation of the Senescence of Cultured Human Diploid Fibroblasts by Carnosine*. Exp Cell Res 1994;212:167-17

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- [3] Hipkiss HR. *Possible Benefit of Dietary Carnosine towards Depressive Disorders*. *Aging and Disease* 2015;6(5):300-303
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- [5] <https://joshmitteldorf.scienceblog.com/2017/03/28/senolytics-against-aging-snapshot-of-a-fast-moving-field/>
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