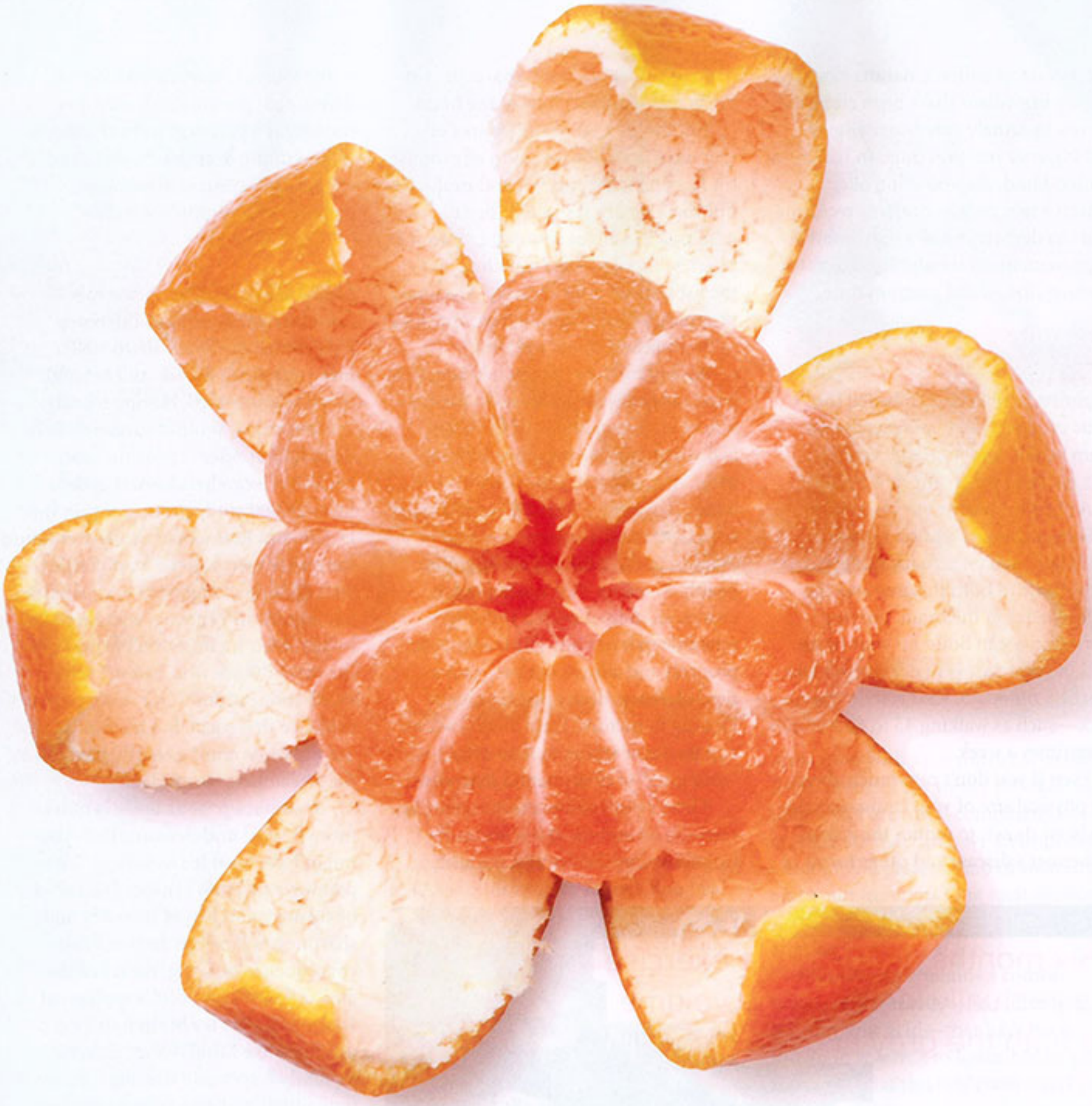

COOLING CHRONIC INFLAMMATION

MODIFIED CITRUS PECTIN RESEARCH SNOWBALLS

BY ISAAC ELIAZ, MD, MS, LAC

This is an exciting time for people interested in integrative medicine. Throughout the past decade, the medical community has gradually come to recognize the value of many natural and complementary approaches that were once dismissed by Western practitioners. Acupuncture, botanicals, and other integrative therapies are being actively investigated by researchers all over the world—with some exciting results.

Analyzing Modified Citrus Pectin

One particular agent that's attracting increased interest in the scientific and medical communities is a specialized form of pectin: modified citrus pectin (MCP). There is a growing body of published preclinical and human clinical data supporting the therapeutic role of MCP in a broad range of applications and conditions–including some of our worst degenerative illnesses, such as heart disease, cancer, and kidney failure.

Regular citrus pectin is a familiar kitchen item, often used to thicken jams and other foods. A soluble fiber, unmodified pectin is commonly found in apples and citrus peels. Regular pectin is known for its digestive benefits; this complex carbohydrate can help the body remove toxins, particularly heavy metals, from the colon and intestines. Heavy metals and other toxins can contribute to brain and neurological dysfunction, kidney and cardiovascular disease, cancer, and other illnesses by disrupting cellular signals, fueling inflammation, and damaging DNA.

For these reasons, regular pectin provides obvious health benefits—but these actions are limited to the digestive tract. The problem is that regular pectin molecules are too large for the body to absorb. As a result, regular pectin passes straight through the digestive tract.

In the early 90s, researchers wanted to find a way to make pectin's benefits available throughout the body. The answer was to reduce the size of pectin molecules and modify their structure, making them available for absorption. This increased bioavailability meant pectin could now deliver its benefits beyond the GI tract, into the circulatory system and throughout the body. The modified structure also increased its benefits and bioactivity. Hence, modified citrus pectin was born.

MCP vs. Galectin-3

When we discuss MCP, we also need to tell a parallel story about a rogue protein called galectin-3. In fact, it's the reason scientists are increasingly interested in MCP—because of its ability to bind and block galectin-3's destructive actions throughout the body. Specifically, MCP has become the most researched galectin-3 inhibitor today.

At normal levels, galectin-3 performs important cellular functions. In fact, galectin-3 is found throughout the body: on cell surfaces, in their nuclei, in circulating blood.

The trouble is, galectin-3 can become overexpressed, particularly as we age. When that happens, it becomes a highly inflammatory agent, driving the advancement of a number of conditions including cancer and cardiovascular disease. The large "PREVEND Study," published in 2012, tested galectin-3 blood levels in almost 8,000 people and found that higher galectin-3 levels were dramatically associated with increased mortality from all causes.

Galectin-3 fuels chronic inflammation and subsequent fibrosis (uncontrolled scar tissue buildup in organs and tissues), so it's a prime culprit in heart failure. Inflammation is also a key component in arteriosclerosis. Increased galectin-3 levels are shown in clinical studies to contribute to coronary artery disease, peripheral artery disease, and stroke.

In 2011, the US Food and Drug Administration (FDA) approved a simple galectin-3 blood test as a predictive biomarker for congestive heart failure. A number of recent studies have supported the use of this test in assessing and monitoring the progression of a number of other diseases, including metastatic cancer, type 2 diabetes, hepatitis C, and rheumatoid arthritis.

The fact that so many different conditions can stem from one aberrant protein illustrates just how insidious galectin-3 can be. Because it's so inflammatory, elevated levels of the protein are associated with a wide variety of acute and chronic diseases. In addition to the conditions cited above, galectin-3 has been linked to ulcerative colitis, Crohn's disease,

liver cirrhosis, hypertension, arthritis, asthma, and many others.

As mentioned, galectin-3 plays a key role in fibrosis, the "remodeling" of connective tissues. This is a major problem because this remodeling is a key feature in cardiovascular, liver, and kidney disease, as well as a wide range of other conditions. In heart failure, fibrous tissues actually change the heart's shape around the ventricles, impairing its ability to pump blood.

Galectin-3 is also particularly problematic in cancer, where it plays a key role in tumor growth and metastasis. Essentially, galectin-3 allows cancer cells to stick together and helps them to migrate and aggregate far away from the primary tumor. Galectin-3 also fuels angiogenesis, the process by which tumors create new blood vessels to meet their ever-increasing nutritional needs. Research shows higher circulating galectin-3 concentrations in patients with melanoma, bladder, prostate, thyroid, gastric, breast, and colorectal cancers. The highest galectin-3 levels correlate with metastatic progression.

MCP, Galectin-3, and Cancer

MCP has a special role to play as a natural systemic galectin-3 binder; it's completely nontoxic and shows no side effects. MCP works because it has a strong affinity for galectin-3, binding to the protein and essentially inactivating it.

MCP has been shown to block cancer cell aggregation, prevent malignant cells from docking to blood vessels, and control angiogenesis. A growing body of research supports MCP as an emerging cancer therapeutic.

- In a 2007 study conducted in Germany, MCP improved quality of life for patients with advanced solid tumors in the colon, breast, lungs, pancreas, and ovaries.
- In 2010, research conducted in animals at Columbia University Medical Center found that MCP encouraged apoptosis (programmed cell death) in prostate cancer cells.
- A 2012 study published in the journal *Cell Biology International* showed that MCP synergized with the anticancer drug doxorubicin, which could allow for lower doses of the toxic chemotherapy.

In addition, MCP has been found in other studies to enhance the therapeutic effects of other chemotherapeutic agents, such as cisplatin and taxol.

Boosting the Immune Response

One of the hottest areas in cancer treatment right now is immunotherapy, the boosting of our own anticancer mechanisms to destroy tumors.

MCP has been shown to have a powerful impact on immunity. In one study, published in *BMC Complementary Medicine* in 2012, MCP activated T cells, B cells, and natural killer (NK) cells against chronic myeloid leukemia, demonstrating that MCP could be an effective component of any immunotherapeutic treatment approach.

Detoxification

The body doesn't react well to heavy metal or environmental toxicity. Heavy metal and toxic body burden can generate chronic pain, high blood pressure, neurodegenerative diseases, cardiovascular disease, cancer, and more. Heavy metals and toxins interfere with cellular activity, damage DNA, impair immunity, and alter other biological pathways.

In addition to its natural binding affinity with galectin-3, research has demonstrated that MCP binds to and removes a variety of toxic heavy metals, including lead, mercury, arsenic, and cadmium, without removing essential minerals.

- A 2006 study published in the journal *Phytotherapy Research* found that, after taking MCP for six days, patients excreted high levels of lead, mercury, and arsenic in their urine.
- Other research, presented at the American Cancer Society meeting in 2004, showed that MCP reduces concentrations of mercury in the body.
- A clinical trial conducted in China showed that MCP dramatically reduces lead levels in children.

In addition, MCP has been shown to remove radioactive isotopes. Its less bioavailable cousin, pectin, was used successfully during the Chernobyl nuclear disaster to reduce radioactive load.

One Protein, Many Conditions

Because galectin-3 is associated with fibrosis and inflammation—common disease-causing mechanisms—it is being explored as a therapeutic target for a wide variety of conditions, such as arthritis, diabetes, and kidney disease.

In addition, MCP's ability to control elevated galectin-3 levels could have an even greater impact on heart disease: reducing vascular inflammation and fibrosis. In one study, reducing galectin-3 levels in mice lowered fibrosis throughout their cardiovascular system. Other studies suggest that blocking galactin-3 following a heart attack can lead to better outcomes.

Effective and Safe

MCP gets a gold medal when it comes to safety and tolerability, with every study showing no side effects. As part of a cancer treatment plan, it protects tissues and organs against the inflam-

matory and fibrotic effects of conventional therapies like radiation, enhances certain chemotherapeutic drugs, removes damaging heavy metals without affecting essential minerals, stimulates NK cells, inhibits angiogenesis, promotes cancer cell death, and inhibits cancer metastasis. However, it's important to note that because MCP is a generic term, not all MCP products are made alike. If you are using MCP, make sure it's the form that has been studied and published in the scientific literature. To learn more about MCP, I recommend the book by health writer Karolyn A. Gazella, "New Twist on Health: Modified Citrus Pectin for Cancer, Heart Disease, and More." Information can be found at newtwistonhealth.com.

As a daily part of general health and preventive regimens, MCP offers multiple important benefits. This natural agent from citrus peels has been studied for more than 20 years, and results continue to support and expand its many benefits. Who would have imagined that from the humble peel of the citrus fruit, we would discover such a powerful ally?

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