



Inflammation

How Berry Phytochemicals May Deter Onset of Diseases



[follow the [Wikipedia](#) links]

*From the [Agricultural Research Service of the US Department of Agriculture](#),
[Agricultural Research](#), April, 2009.*

Several disparate diseases like cancer, arthritis, diabetes, vascular disease, Alzheimer's disease, and many others may have common mechanisms for how they start. Each of these diseases may arise from chronic [inflammation](#).

One of the common threads emerging from current berry research is that phytochemicals -- like [anthocyanins](#) and other polyphenols responsible for the varied pigmentation of berries - have a role in changing cell activities and [genes](#) associated with inflammation responses.

Some Facts and Research Progress

- inflammation is a double-edged sword -- when you have a cut or other wound, it is a strong defense, but chronic, "dysregulated" inflammation can increase disease risk.
- studies led by ARS molecular biologist Dr. Daniel Hwang are yielding new clues to this complex puzzle. His experiments with cells cultured in the laboratory have uncovered

- probable modes of action by phytochemicals.
- phytochemicals can interfere with the normal flow of chemical signals sent to and from cells.
 - The cells of particular interest to Hwang are those involved in unhealthy inflammation. The messages they send are in the form of proteins.



Black mulberry (*Morus spp.*), rich in anthocyanins

Read a Berry Doctor's review on [berries and inflammation from 2007 here](#), *click!*

Disease Onset?

Dr. Hwang's team is identifying that inflammation can interfere with messages that would travel between proteins in adjacent cells.

If unimpeded, such messages easily reach and activate "pro-inflammatory genes." As their name implies, these genes trigger an inflammatory response.

How Berry Polyphenols May Help

Dr. Hwang's studies indicate that some **polyphenols**, like anthocyanins, protect us by disrupting established inflammation pathways.

When they do that, they **block activation of pro-inflammatory genes**.

Different phytochemicals may have different ways of interfering with inflamed proteins.

Interested in more detail?

Read a previous Berry Doctor report on [how anthocyanins may interrupt inflammatory processes](#), *click!*

The Special Case of Resveratrol

Resveratrol interferes with molecules that help convey signals to and from inflamed proteins.

When resveratrol interacts with these proteins, the effect is somewhat like that of a traffic light slowing or stopping the flow of vehicles on a busy street.



Dark grapes contain resveratrol in their skins and seeds.

Hint: try the darkest seeded grapes and chew the seeds to get extra resveratrol!

Help From Omega Fatty Acids

Omega-3s found in some marine fish and in edible seeds of berries (**alpha-linolenic acid**), inhibit certain inflamed proteins, whereas saturated fats, like those in red meat and butter, activate them.

*Combining berries and omega-3 sources
in your diet may compound defenses
against inflammation and onset mechanisms
of various diseases!*

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