

# Green tea supplements stop cancer drug bortezomib working

- \* 14:30 06 February 2009 by Rachel Nowak
- \* For similar stories, visit the Cancer Topic Guide

Green tea enjoys a positive association with health, so it's not surprising that many cancer patients drink it or take green tea supplements. But that may not be wise if you are being treated for certain types of blood cancer with bortezomib, which is sold under the brand name Velcade.

Chemicals in green tea called polyphenols - and in particular a potent and abundant one referred to as EGCG - can inactivate the drug, according to a new study.

"We saw 100% inactivation of Velcade at levels easily achieved by patients who take green tea supplements, and possibly those who drink large amounts of tea," says cancer biologist Axel Schönthal of the University of Southern California in Los Angeles, who led the study.

Supplement capsules

Green tea supplements are available in health food stores in the US in capsules containing up to 50 times as much polyphenol as a single cup of tea. They have already been blamed in liver and kidney damage.

Velcade is used to treat multiple myeloma, the second most common blood cancer. It kills cancer cells through a process called apoptosis.

Hoping to discover possible beneficial effects of green tea on cancer treatments, the Schönthal team treated mice with human multiple myeloma tumours with different combinations of EGCG and Velcade. To their surprise, tumour apoptosis was blocked rather than enhanced in mice that were given Velcade and EGCG together.

EGCG concentrations of 2 to 5 micromoles per litre - typical of blood levels in people who take supplements - also totally blocked Velcade's ability to kill multiple myeloma cells in lab dishes.

Drug blocked

When the team analysed the biochemical interaction between the two compounds they discovered that EGCG interacts with a boronic acid unit, which forms part of the Velcade molecule, preventing the drug binding to its target in the cancer cell. No other approved cancer drug contains a similar chemical unit, but several that are under investigation do contain it, says Schönthal.

"It's really nice work. But green tea as a drink is clearly different to a supplement where any potentially adverse effects will be magnified, so it may be overkill to tell people not to drink green tea, at least in moderation," says blood cancer researcher Simon Harrison of the Peter MacCallum Cancer Centre in Melbourne, Australia.

The finding may help explain why Velcade is ineffective in roughly one-third of patients, a peculiarity that in the UK has led to a novel funding scheme in which health agencies only pay for the expensive treatment when it works.

"It's speculation but perhaps the therapeutic efficacy of Velcade would have been higher if all the patients had abstained from green tea," says Schönthal.

He also suggests that patients on Velcade who take a green tea supplement may find that it reduces the drug's side effects, such as extreme fatigue. This might encourage them to continue take the supplement, when in fact the side effects might be less marked only because the drug is not working.

Journal reference: Blood, DOI: [10.1182/blood-2008-07-171389](https://doi.org/10.1182/blood-2008-07-171389)