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Green tea flavonoid may benefit liver transplant patients

By Nathan Gray, 02-Dec-2011

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The green tea flavonoid epigallocatechin-3-gallate (EGCG) could help in the preventing re-infection with of the virus hepatitis C following liver transplants, suggest researchers.

Writing in the journal *Hepatology*, a team of German researchers report that the green tea molecule, EGCG, potently inhibits the entry of the hepatitis C virus (HCV) into liver cells. As such, they suggest EGCG could play a role in antiviral strategies aimed at the prevention of HCV re-infection after liver transplantation. "We identified EGCG, a natural compound contained in green tea, as an inhibitor of HCV entry into target cells and cell-to-cell spread between neighboring cells. The effect is unique to EGCG and not shared by other green tea catechins," said the researchers, led by Dr. Sandra Ciesek and Dr. Eike Steinmann of the Hannover Medical School, Germany.

"Moreover, we demonstrated that EGCG acts by blocking viral attachment to target cells (i.e., the initial step of the cell entry process), whereas it does not affect other replication cycle stages," they wrote.

The researchers said that the discovery of such a novel inhibitor could provide a new approach to prevent HCV infection, "especially in the setting of liver transplantation of chronically infected HCV patients".

Hepatitis

Hepatitis C is one of the most common causes of chronic liver disease, affecting up to 170 million people worldwide according to estimates from the World Health Organization (WHO). It is a primary indication to the need for liver transplantation.

The authors warned that infection can lead to chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC) or primary liver cancer.

While standard treatment with interferon with ribavirin and newer protease inhibitors may clear infection in some individuals, the research team explained that a substantial number of patients do not respond to such therapies. As a result, for individuals receiving liver transplants due to complications from HCV, re-infection of the healthy donor liver is a major concern.

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Antiviral strategies that target HCV in its early stages are urgently needed to prevent graft reinfection and improve long-term outcomes for patients.

"Green tea catechins such as EGCG and its derivatives epigallocatechin (EGC), epicatechingallate (ECG), and epicatechin (EC) have been shown to exhibit antiviral and anti-oncogenic properties," explained Ciesek.

"Our study further explores the potential effect these flavonoids have in preventing HCV reinfection following liver transplantation," she said.

Study details

Ciesek, Steinmann and their colleagues reported that unlike its derivatives, EGCG inhibited the entry of HCV into liver cells.

"EGCG had no effect on hepatitis C virus RNA replication, assembly, or release of



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progeny virions. However, it potently inhibited ... entry into hepatoma cell lines as well as primary human hepatocytes," said the researchers.

They revealed that pre-treatment of cells with EGCG before inoculation with HCV did not reduce infection; however application during inoculation was found to block the rapid spread of the HCV.

Ciesek said that the results suggested that that EGCG is able to block the spread of HCV because it inhibits viral attachment—the initial step in the HCV infection process.

Source: *Hepatology*
Volume 54, Issue 6, Pages 1947–1955, doi: [10.1002/hep.24610](https://doi.org/10.1002/hep.24610)
"The green tea polyphenol, epigallocatechin-3-gallate, inhibits hepatitis C virus entry"
Authors: S. Ciesek, T. von Hahn, C.C. Colpitts, L.M. Schang, M. Friesland *et al*

Keywords: [green tea](#), [EGCG](#), [hepatitis](#)

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