

# What is the role of the omentum in regenerating the liver?

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In their recent work to be published on March 7, 2009 in the *World Journal of Gastroenterology*, Dr. Singh and his colleagues from the Cook County Hospital in Chicago (USA) first activated the omentum using a foreign body to increase its content of stem cells and growth factors and then used the activated omentum to regenerate the liver. They cut and removed a small piece of the liver tissue and let the omentum, pre-activated by foreign body, adhere to the wound in order to supply stem cells to the injured liver.

They found that the [liver](#) of these rats treated with activated [omentum](#) expanded to a size 50% greater than the original, an outcome never reported before. They stained the liver sections to understand the mechanism of this result and found that there was an interlying tissue present between the wounded liver and the activated omentum in which bile ducts, containing cytokeratin-19 positive oval cells (liver [stem cells](#)), extended from the wound edge. In this interlying tissue oval cells were abundant and appeared to multiply to form new liver tissue.

In rats pre-treated with drugs which inhibited hepatocyte growth, liver proliferation was ongoing, indicating that [liver regeneration](#) by the omental intervention was the result of oval [cell expansion](#) and not multiplication of existing hepatocytes. Further support for the involvement of stem cells was shown by the up-regulation of genes associated with [pluripotent stem cells](#) (Nanog and Oct-4) and other genes that play a part in fetal [liver development](#) (Wnt-4 and  $\alpha$ -fetoprotein).

The present study is the first to demonstrate the unique role of the omentum in regenerating the liver. It may be noted that although Singh and his group have demonstrated the power of the omentum in regenerating a normal liver in this study it remains to be investigated whether this methodology can result in regeneration in a chronically diseased liver.

Dr. Singh and his group have been publishing their work on the omentum and its use to regenerate diseased organs for the last 3 years from the Cook County Hospital in Chicago, USA and its sister research institution, the Hektoen Institute of Medicine. The present work is an extension of their work in the use of adult stem cells derived from the omentum.

The use of embryonic stem cells to regenerate organs is controversial as it is hampered by ethical, political and safety concerns. In that regard, the use of the patient's own tissue (omentum) as a source of stem cells to regenerate the liver (and possibly other organs), as shown by Singh and his group, will be free of such concerns and therefore of great public good.

More information: Singh AK, Pancholi N, Patel J, Litbarg NO, Gudehithlu KP, Sethupathi P, Kraus M, Dunea G, Arruda JAL. Omentum facilitates liver regeneration. *World J Gastroenterol* 2009; 15(9): 1057-1064, [www.wjgnet.com/1007-9327/15/1057.asp](http://www.wjgnet.com/1007-9327/15/1057.asp)

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