

Parasite growth hormone pushes human cells to liver cancer

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Scientists have found that the human liver fluke (*Opisthorchis viverrini*) contributes to the development of bile duct (liver) cancer by secreting granulin, a growth hormone that is known to cause uncontrolled growth of cells. Details are published October 9 in the open-access journal *PLoS Pathogens*.

Drs Michael Smout and Alex Loukas from the Queensland Institute of Medical Research, with collaborators at Khon Kaen University and George Washington University, say they are excited by the novel discovery which shows that a growth hormone from a parasite can affect human cells.

"It was known that *O. viverrini* secreted proteins cause cell growth, but the identity of the protein was unknown. We also knew that the parasite secreted granulin but we did not know that it could affect the human cells around it," said Dr Loukas.

Scientists used *E. coli* bacteria to express the *O. viverrini* granulin, which was shown to induce proliferation in mouse fibroblast cells and human bile duct [cancer cells](#) in the absence of the parasite. Proliferation of the cells was halted by adding anti-granulin antibody, thus proving granulin's role in producing a cancerous environment.

The International Agency for Research on Cancer classifies the human liver fluke as a Group I [Carcinogen](#), meaning that *O. viverrini* is a proven cause of cancer. In northern Thailand, where the liver fluke is most

common, more than 7 million people are infected at any given time.

Previously, it was thought that the cancer was caused by the physical damage brought about by the fluke feeding on cells lining the bile ducts, as well as a diet high in nitrosamines from fermented fish (a native dish of Thailand). Smout, Loukas and colleagues now suggest that the granulin secreted by the parasite is a major contributing factor to developing bile duct cancer.

"This discovery leads the way to a better understanding of how this parasite causes such a devastating form of cancer," said Dr. Loukas.

More information: Smout MJ, Laha T, Mulvenna J, Sripa B, Suttiaprapa S, et al. (2009) A Granulin-Like Growth Factor Secreted by the Carcinogenic Liver Fluke, *Opisthorchis viverrini*, Promotes Proliferation of Host Cells. *PLoS Pathog* 5(10): e1000611.
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