

Study reveals new mechanism used by cancer cells to disarm attacking immune cells

20 November 2017



Credit: Ohio State University Medical Center

A new study by researchers at The Ohio State University Comprehensive Cancer Center - James Cancer Hospital and Solove Research Institute (OSUCCC - James) identifies a substance released by pancreatic cancer cells that protects them from attack by immune cells called macrophages.

The study found that the substance, called Gdf-15, might be required for the development of early pancreatic tumors. The research also revealed that a molecule pronounced N-F-kappa-B (NF-kB) helps tumor cells produce Gdf-15.

When [macrophages](#) take up Gdf-15, it prevents them making nitric oxide and [tumor necrosis factor](#), two chemicals they release to kill cancer cells. Ironically, the researchers found that NF-kB in macrophages plays an important role in the production of nitric oxide and tumor necrosis factor.

The findings are reported in the *Journal of Clinical Investigation*.

"This study shows that GDF-15 plays an important role in the development of pancreatic cancer and might be required for the development of early pancreatic tumors," says principal investigator Denis Guttridge, PhD, professor of Cancer Biology and Genetics at Ohio State and associate director for basic research.

"We believe that this mechanism for disarming macrophages develops early in cancer cells, enabling small tumors to survive and grow," adds Guttridge, who also is in the OSUCCC - James Molecular Carcinogenesis and Chemoprevention Program. "These findings support the need for preclinical studies to determine the role of GDF-15 in the development of pancreatic cancer."

Guttridge and his colleagues conducted the study using pancreatic-cancer cell lines, cells from patient tumors and an animal model. Key findings include:

- NF-kB is a direct regulator of Gdf-15;
- GDF-15 suppresses macrophage cell-killing activity by inhibiting the production of [nitric oxide](#) and tumor necrosis factor;
- Both GDF-15 and NF-kB are overexpressed in patients with [pancreatic cancer](#).

"Overall," Guttridge says, "our results reveal that NF-kB is responsible for the synthesis and secretion of GDF-15 from pancreatic tumor cells, and that GDF-15 then inhibits NF-kB activity in macrophages and blocks them from killing [tumor](#) cells."

More information: Nivedita M. Ratnam et al, NF- κ B regulates GDF-15 to suppress macrophage surveillance during early tumor development,

Journal of Clinical Investigation (2017). DOI:
[10.1172/JCI91561](https://doi.org/10.1172/JCI91561)

Provided by Ohio State University Medical Center
APA citation: Study reveals new mechanism used by cancer cells to disarm attacking immune cells
(2017, November 20) retrieved 20 June 2022 from <https://medicalxpress.com/news/2017-11-reveals-mechanism-cancer-cells-immune.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.