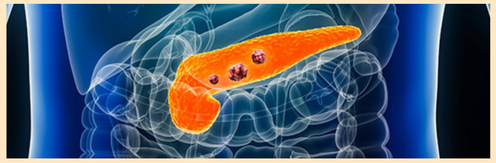
Impact of NLRP3 Inflammation Protein on Pancreatic Cancer

Cancer Center
NCI-DESIGNATED COMPREHENSIVE CANCER CENTER

Migachelle Banks Romano, Laura Pike, Makenna May, Jesus Amo-Aparicio, Adrian Dominguez, Joseph M. Gaballa, Todd M. Pitts, Carlo Marchetti

Background

- Pancreatic cancer is challenging to treat due to a barrier that blocks attacks from the immune system, and chemotherapy is the only treatment available for advanced stages.

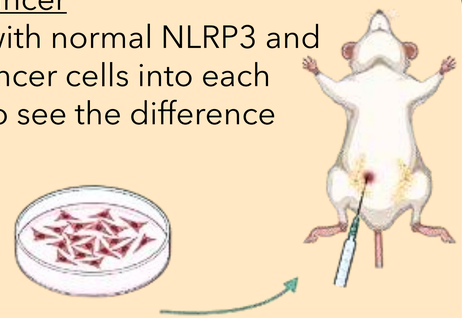


- Pancreatic cancer grows quickly and is hard to treat, partly because inflammation speeds up its growth. However, we don't fully understand how this happens. Our lab aims to find new ways to treat this cancer by targeting inflammation. We are particularly interested in a protein called NLRP3, which might affect how fast the cancer grows and how it responds to treatments.

Goal and Approach

1) Determine if NLRP3 worsens pancreatic cancer

We studied two groups of mice: one group with normal NLRP3 and another without it. We injected pancreatic cancer cells into each mouse and let the tumors grow for 21 days to see the difference NLRP3 makes.

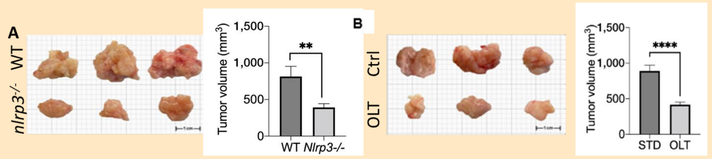


2) Determine if blocking NLRP3 enhances the effectiveness of treatment drugs like Gemcitabine

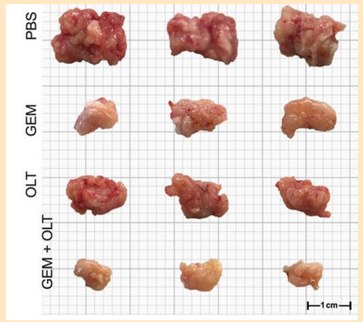
To determine if blocking NLRP3 makes treatment drugs more effective, we gave the chemotherapy drug Gemcitabine to the same groups of mice mentioned above, starting three days after the surgery. We then observed the tumor growth over the next 21 days.

Key Findings

- Blocking NLRP3 slows down cancer progression.



- Mice treated with NLRP3 blockers had better outcomes compared to those on standard chemotherapy.



Future Direction

- We plan to study how NLRP3 protein affects pancreatic cancer focusing on specific cells involved in the immune system called Macrophages.
- We also want to explore how NLRP3 might be affecting other important functions in cancer cells such as cells involved in giving them energy to multiply.

Acknowledgment

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