

Ovarian Cancers Use Different Cellular Fuels to Drive Tumor Growth

What is WNT4?

- WNT4 is protein necessary for development of the female reproductive system
- DNA is passed from parent to child, but this DNA naturally occurs with different "variations"
- Normal variation in the DNA encoding the gene "WNT4" is associated with increased risk of gynecologic disease:
- Endometriosis condition where the uterine lining grows outside of the uterus
- Ovarian Cancer cancer originating from the endometrium or fallopian tubes



Who inherits WNT4 DNA variants?





- Variants in the WNT4 gene are inherited most (45-55%) in frequenly East Asian populations
- East Asian populations also have an increased risk of an aggressive subtype called ovarian clear carcinoma (OCCC) cell

What does the WNT4 variant do?

- These variants cause an increase in WNT4 levels
- High WNT4 is associated with poorer ovarian cancer outcomes
- Therefore, there is a need to research WNT4 disparities







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How am I researching this?

Cancer cells need *fuel* to be able to *grow*

- 1. We are investigating cancer cell **fuel sources**
- Do the cells use sugars or fats?
- AKA: Does the car take gas or diesel?
- 2. We are investigating the rate of their **growth**
- How many cancerous cells are present?
- AKA: How far will the car go with gas v diesel?



What does WNT4 do to mitochondria?

"Mitochondria is the powerhouse of the cell"

Mitochondria are like a *car engine*, which take a fuel source, like gas or diesel, and turns it into energy, like *torque/speed/horsepower*, needed for cancer growth

WNT4 Deprived

By decreasing WNT4 in ovarian cancer cells, the mitochondria, or the "*car engine*," falls apart





How does WNT4 impact fuel source?



• Ovarian cancer cells use WNT4 protein to grow • WNT4 keeps the engine intact

• Ovarian cancer cells use lipids as energy to grow • FATS fuel the car engine

Why is this important?

• Ovarian cancer is difficult to treat

Standard treatments are not effective for all subtypes or for late stage ovarian cancers

 Cancer cells are dependent on the mitochondria or engine to grow

If we know how to break the engine or deprive the engine of its fuel source, we can develop tailored treatments for ovarian cancer patients



Gynecologic Oncology

