UT Southwestern
Medical Center

2023 PROGRESS REPORT

Advancing Early Detection Methods for Ovarian Cancer

Prepared for THE MICHELLE-ADELE FOUNDATION

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Shaping the Future of Medicine

Effective screening approaches for ovarian cancer are urgently needed as more than 19,000 women are diagnosed with ovarian cancer each year in the U.S. alone. If ovarian cancer is detected at an early stage, approximately 94% of patients can survive for more than five years following diagnosis. While cancer detection methods have historically relied on detecting the cancer itself, we have developed an innovative approach to improve the early detection of ovarian cancer by identifying anti-cancer immune responses.

PROGRESS

As a first step, it was necessary to identify a biomarker associated with anti-cancer immune responses. We accomplished this by demonstrating that we could distinguish T cells (a type of immune cell) associated with ovarian cancer from T cells associated with healthy Fallopian tubes and ovaries [PMC7058380] or with benign ovarian masses.

The most important next step is to prove the feasibility of our approach on blood samples. At UT Southwestern, we are collecting blood samples from women diagnosed with ovarian cancer and from women who serve as an important control population: women with healthy ovaries and women with benign ovarian masses. We have so far collected 88 samples, including nine with confirmed ovarian cancer, 30 benign tumors, and 25 normal tubes/ovaries. Once we reach 10 confirmed ovarian cancer cases, we will conduct sequencing on the first batch of samples from 30 women: 10 confirmed ovarian cancer cases, 10 confirmed benign ovarian mass cases, and 10 confirmed healthy controls.

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In the meantime, to continue development of our statistical methods while sample collection was ongoing, we obtained blood samples from an ovarian cancer biobank maintained at Mayo Clinic. Those samples were from the Mayo Clinic's patients who had been diagnosed with ovarian cancer.

For healthy control samples, we utilized publicly available T-cell data from cancer-free individuals. Using our original, previously reported model developed on ovarian cancer tissue and healthy ovary tissue, we refit the parameters using the blood samples

and obtained 85% classification accuracy. While this is an exciting result, the fact that the cancer and healthy control samples were not collected at the same institution means that the sample collection site is a confounding variable in our result. Thus, it is critical to validate this result in a gold standard study design where all samples are collected and processed at the same location and by identical protocols.

WHAT'S NEXT?

With the generous support of The Michelle-Adele Foundation, we have been able to cover important costs for patient consenting, sample collection, and sample processing and storage. The next step is to conduct T-cell sequencing on patient-matched ovarian tissue and blood samples for a cost of $1,650 per patient. Overall, the total cost for the first stage is $49,500, and we plan to utilize the remaining funds from The Michelle-Adele Foundation to these important sequencing costs.

We are extremely grateful for the opportunity to collect this gold standard data locally since it is critical to the continued advancement of this novel approach to detect ovarian cancer as early as possible and provide the best possible outcomes to our patients.

For more information, please contact:

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