

## PRODUCT

Ovarian cancer specific antibody and its use in a liquid biopsy test.

## INDICATION

Epithelial ovarian cancer

#### VALUE PROPOSITION

- Antibody has been fully characterized and sequenced.
- Use in liquid biopsy tests for target cell enrichment using magnetic capture.

#### **DEVELOPMENT STAGE**

Proof of concept work is ongoing.

#### PUBLICATIONS

Mazumder S, Johnson JM, Swank V, Dvorina N, Martelli E, Ko J, Tuohy VK. Primary Immunoprevention of Epithelial Ovarian Carcinoma by Vaccination against the Extracellular Domain of Anti-Müllerian Hormone Receptor II. <u>Cancer Prev Res (Phila)</u>. 2017 Nov;10(11):612-624.

INTELLECTUAL PROPERTY Patent Pending

#### **CONTACT INFORMATION**

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# Antibody Against Ovarian Cancer for use in Liquid Biopsy Tests

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### **UNMET NEED**

Ovarian cancer is the seventh most common cancer in women worldwide with epithelial ovarian carcinoma being the most prevalent form of ovarian cancer in the USA representing ~85% of all cases (almost exclusively in postmenopausal women) and causing more deaths than any other gynecologic malignancy (53% mortality rate within 5 years of diagnosis). Early detection and intervention are crucial to achieving a successful outcome, but current diagnostic methods including transvaginal ultrasound (TVUS) or blood tests for elevated CA-125 are insufficient. Detection of circulating tumor cells (CTCs), which are present at low levels in the blood of individuals with ovarian cancer and have been implicated in the spread of the disease to lymph nodes and distant organs, is hampered by lack of adequate methods for isolation of CTCs. Antibodies with high levels of specificity for target proteins expressed only on the surface of ovarian cancer cells are needed to develop liquid biopsy tests with suitable sensitivity and specificity.

## SOLUTION

Cleveland Clinic researchers developed a monoclonal antibody against ovarian cancer for use in a liquid biopsy test to capture and detect circulating ovarian cancer tumor cells. The antibody targets the extracellular domain of AMHR2-ED, which is normally expressed only in the ovaries of pre-menopausal women. After menopause, the target protein is no longer expressed in normal tissues and is only found again in ovarian cancer cells. Conjugation of the antibody with a magnetic nanoparticle allows separation of target cells expressing the protein of interest using microfluidics and precise magnetic fields. Cell tracking velocimetry data indicate the magnetically tagged antibody-cell complexes have adequate magnetic mobility to be separated from background matrix.



**Fig 1:** Detection of high levels of target protein expression on a patient-derived ovarian cancer cell line (left; merged, center; phase contrast, right; labelled candidate antibody).

**Fig 2:** sedimentation-field gradient directed mobilities of the magnetically tagged PDX10 cells in a magnetic field.