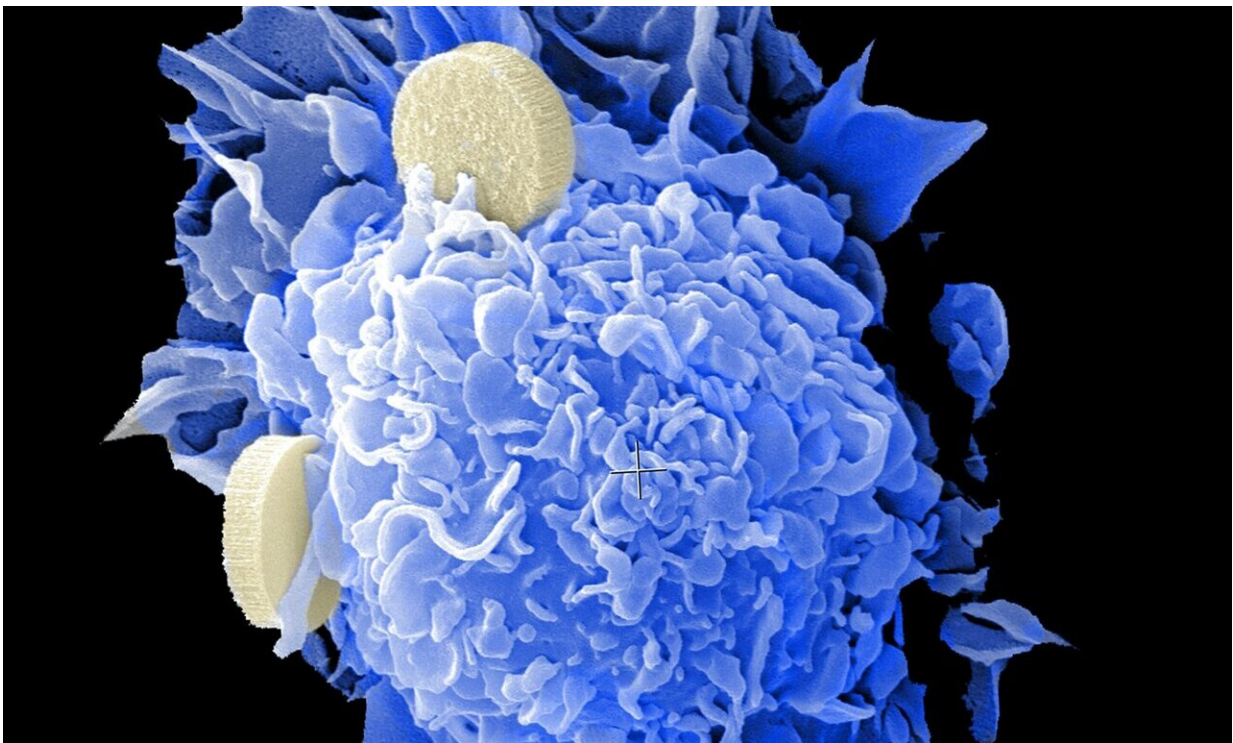# Accurate predictions of ovarian cancer outcome possible with new classification system

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Credit: Unsplash/CC0 Public Domain

The new, Oxford-developed method for subtyping ovarian cancer has been validated in a recent collaboration between the University of Oxford and Imperial College London. Dubbed the "Oxford Classic,"

researchers have demonstrated that it enables the accurate prediction of patient disease outcome, as well as the development of new targeted cancer therapies.

Researchers have discovered and identified sub-types of ovarian cancer cells, which can then be used to accurately identify which ovarian cancer subtypes are likely to lead to more severe cancer outcomes—an approach which has been dubbed the "Oxford Classification of Carcinoma of the Ovary' or "Oxford Classic" for short.

The Oxford Classic, which was developed in Oxford last year, will provide much more accurate predictions for disease outcome in patients, as well as helping researchers to develop targeted therapies for each type of cancer. A study published today in *Clinical Cancer Research*, has demonstrated its powerful prognostic usage in a new independent set of samples from a group of ovarian cancer patients.

Serous ovarian cancer (SOC) is the most common ovarian cancer type but is challenging to classify and predict its prognosis. Using the Oxford Classic, researchers found that a specific SOC subtype, known as "EMT-high subtype," were associated with a lower survival rate.

EMT stands for epithelial-mesenchymal transition, the process by which epithelial cells change and become more mobile. This mobility provides the cells with the opportunity to spread, leading to cancer progression. EMT-high subtypes are tumors that have a high number of cancer cells with greater mobility.

Researchers also found that EMT-high subtypes were associated with abundance of a type of immune cells called M2 macrophage. M2 macrophages possess immunosuppressive properties, and can lead to poorer treatment responses if they are found in high quantities within a tumor. It has previously been observed that patients with high-EMT

tumors had a poor immune response. This study confirms that the EMT-high subtype is associated with an immunosuppressive environment (and so poor patient responses to treatment) due to their association with more M2 macrophages—a link that has not previously been identified.

Whether M2 macrophages induce EMT or EMT results in higher levels of M2 macrophages will be an important question to be addressed by future work. However, this study has demonstrated the Oxford Classic's strong ability to predict a patient's prognosis.

Professor Ahmed Ahmed, of the University of Oxford's Nuffield Department of Women's and Reproductive Health and originator of the Oxford Classic, said, "Our group is very excited that we were able to confirm that the Oxford Classic can predict which patients are likely to have poor outcome. It is now important to identify new personalized therapies for the Oxford Classic-defined EMT-high ovarian cancer subtype. The finding that there is a strong connection with abundant M2 Macrophages already offers a good hint as to where we could find good treatment options for patients with this type."

Professor Christina Fotopoulou of Imperial College London said, "This has been a very fruitful collaboration between two major UK gynecological cancer centers; Oxford and Imperial College. We have generated very promising results towards an individualisation of care of our ovarian cancer patients. Our data will help clinicians to stratify patients to the right treatment pathway based on features of tumor biology of their disease. I hope we can continue to work together on that basis and expand and validate our data further also on a larger scale."

Classifying the EMT status of a tumor, using the Oxford Classic, could potentially become a valuable part of future cancer stratification methods. This will ensure that appropriate treatment methods and attention are given to patients with a poorer overall prognosis.

Cary Wakefield, CEO of Ovarian Cancer Action, said, "While other cancers have achieved major improvements in treatment outcomes, ovarian cancer continues to go unrecognized, underfunded, and misdiagnosed. The Oxford classic is an exciting breakthrough that will help to identify new treatment options for ovarian cancers that have a lower chance of survival. Funding important research like this will bring us closer towards a shared goal of more women surviving ovarian [cancer](#) ."

More information: Zhiyuan Hu et al. The Oxford Classic Links Epithelial-to-Mesenchymal Transition to Immunosuppression in Poor Prognosis Ovarian Cancers, *Clinical Cancer Research* (2021). [DOI: 10.1158/1078-0432.CCR-20-2782](#)