

[Inici](#) > DECIDER: Improved clinical decisions via integrating multiple data levels to overcome chemotherapy resistance in high-grade serous ovarian cancer

DECIDER: Improved clinical decisions via integrating multiple data levels to overcome chemotherapy resistance in high-grade serous ovarian cancer

Description

The goals of this inter-disciplinary project are to:

- 1) gain understanding of the mechanisms causing chemoresistance in high-grade serous ovarian cancer (HGSOC) patients,
- 2) deliver tools that enable effective and cost-efficient personalised treatment options for HGSOC patients, and
- 3) commercialise predictive kits & software for treatment response prediction and finding the right therapeutic regimen to the right patient.

This project takes an advantage on prospectively and longitudinally collected fresh and blood specimens of HGSOC patients. Longitudinal, multi-layer data are analysed with ML and AI methods to predict patient treatment response and identify the most effective treatment options. Drug screening with patient-derived 3D ex vivo cell models are used to identify drug combination options. Key results will be validated with retrospective cohorts, and in vitro, ex vivo & in vivo models. We will develop an open-source software to visualise all relevant patient-specific data to guide clinical decision-making.

Clinically most actionable treatment suggestions will be evaluated in virtual molecular tumour board and translated to patient care. Ovarian cancer kills more than 44,000 women in Europe every year due to lack of effective and long-lasting therapeutic regimens. DECIDER presents an innovative strategy to suggest effective treatments that lead to a marked decrease in ovarian cancer deaths and reduce the number of expensive but inefficient treatments. Our approach paves the way to move beyond the current trial-and-error clinical assessment of drug combinations toward more systematic prediction of the most effective treatments for each patient.

The proposed concept will be a major breakthrough in personalised medicine and will benefit individual patients and the health-care system through more effective treatments, and the diagnostic and pharmaceutical industry through tools for better stratified clinical trials, and novel treatment and diagnostic modalities.

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