



DECIDER

Improving clinical decisions in cancer



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Improving clinical decisions in cancer

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

What is DECIDER?



The DECIDER project is a consortium project funded by the European Commission under the Horizon 2020 research and innovation program from **February 1, 2021, to July 31, 2026**. The project is coordinated by the University of Helsinki, Finland.

In the DECIDER project, **high-grade serous ovarian cancer** and its chemotherapy resistance are studied. Patient recruitment, and collection of samples and clinical information are done at the Turku University Hospital. Samples are analyzed with state-of-the-art DNA,

RNA, ChIP-sequencing, imaging, and histopathological data analysis. All those data are combined with Artificial intelligence (AI) methods to predict outcome and chemotherapy resistance and to suggest better treatment options that directly benefit the patients.

Background

Ovarian cancer kills more than 40 000 women in Europe each year. High-grade serous ovarian cancer (HGSC) is the most common and most difficult to treat subtype of this disease. Although initially most of the patients' tumours respond well to surgery and chemotherapy, more than half of the patients experience relapse within five years after diagnosis. The tumour typically develops chemotherapy resistance, which means that it responds less and less to the next rounds of treatment. The tumours consist of several heterogeneous cell populations with many mutations. This makes it difficult to find effective drugs to which the cells do not become resistant during treatment. Currently, there are no effective treatment options available for chemotherapy-resistant HGSC. This is therefore the focus of research in the DECIDER project.





Main pillars of the DECIDER project

1 **Prediction of patients' treatment response.**

Tissue and blood samples from HGSC patients are collected and analyzed using DNA, RNA and ChIP-sequencing. The results are combined with data from histopathological images, functional imaging, and clinical records. Using artificial intelligence (AI) methods, we aim at an early identification of patients who will become therapy-resistant.

2 **Overcoming chemotherapy resistance.**

To understand and overcome mechanisms causing chemoresistance, we analyze longitudinal tissue and plasma samples (from before and after treatments as well as follow-up). Our goal is to reveal the dominant chemoresistance mechanisms based on sequencing and clinical data, and thereby suggest pathways for intervention.

3 **High-throughput *ex-vivo* drug screening.**

To discover effective treatment modalities, we conduct high-throughput drug screening experiments using *ex-vivo* cell model systems. Since the studied drugs are already approved for clinical use, the results can be translated rapidly into clinical management of HGSC patients.

4 **Open access software to facilitate clinical decision making**

To integrate results and data relevant to clinical decision-making we are developing open-source software tools with intelligent human-computer interfaces that enable the integration and visualization of all necessary information about a patient, including results from sequencing and imaging analysis.

5 **Active engagement of stakeholders and research community**

DECIDER involves healthcare providers, patients, researchers, policy makers, application developers, and AI experts during the whole project life to achieve high user acceptance.



Consortium

DECIDER is a multidisciplinary research project that combines expertise from 16 research groups and companies in 14 organisations in seven European countries. The expertise of the partners ranges from clinical medicine, genomics, molecular biology, computer science and AI to biomedical and privacy laws.

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