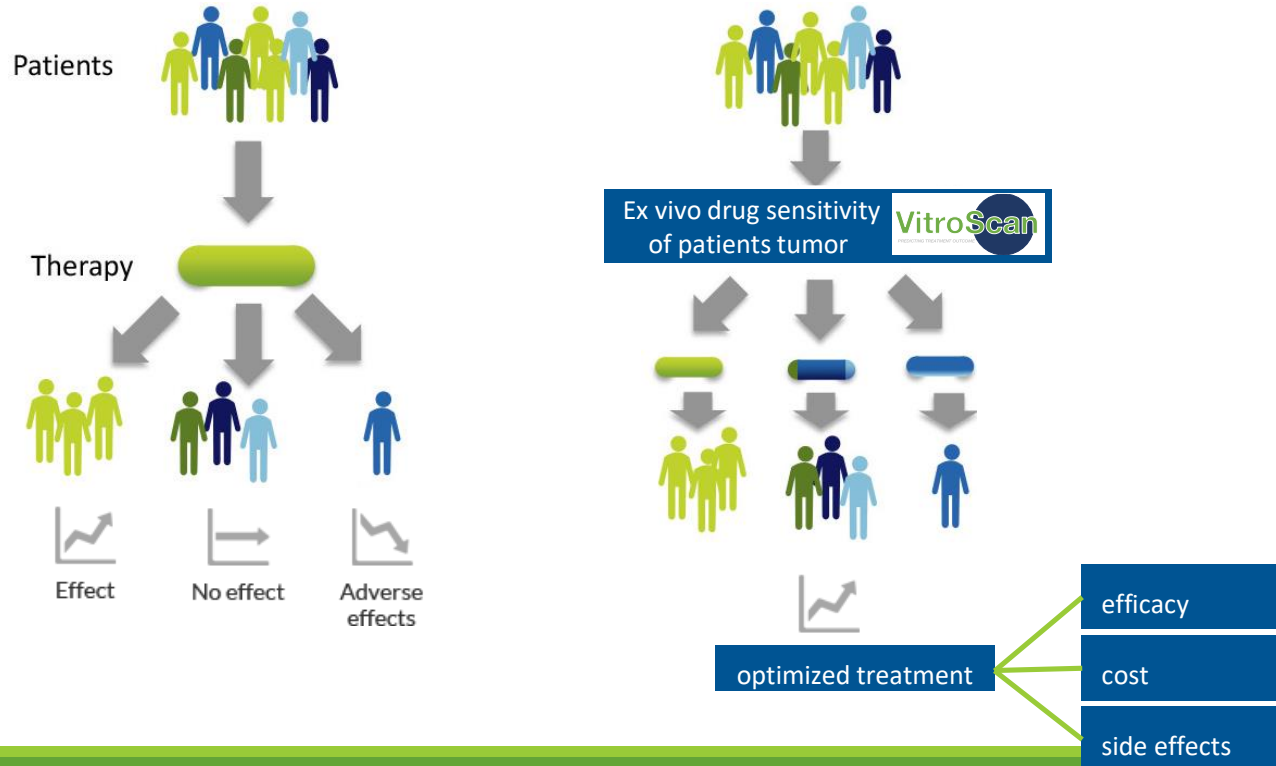


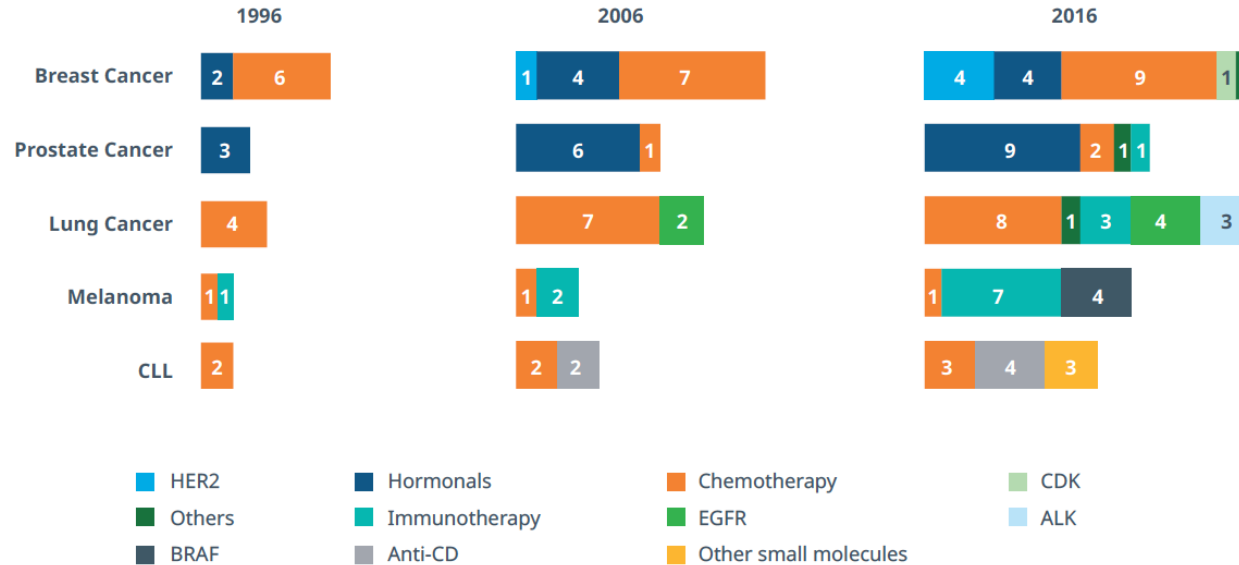
EX VIVO 3D TUMOR TESTING
FOR TREATMENT RESPONSE PREDICTION

Personalized Medicine by better Diagnostics!!



Increasing treatment complexity

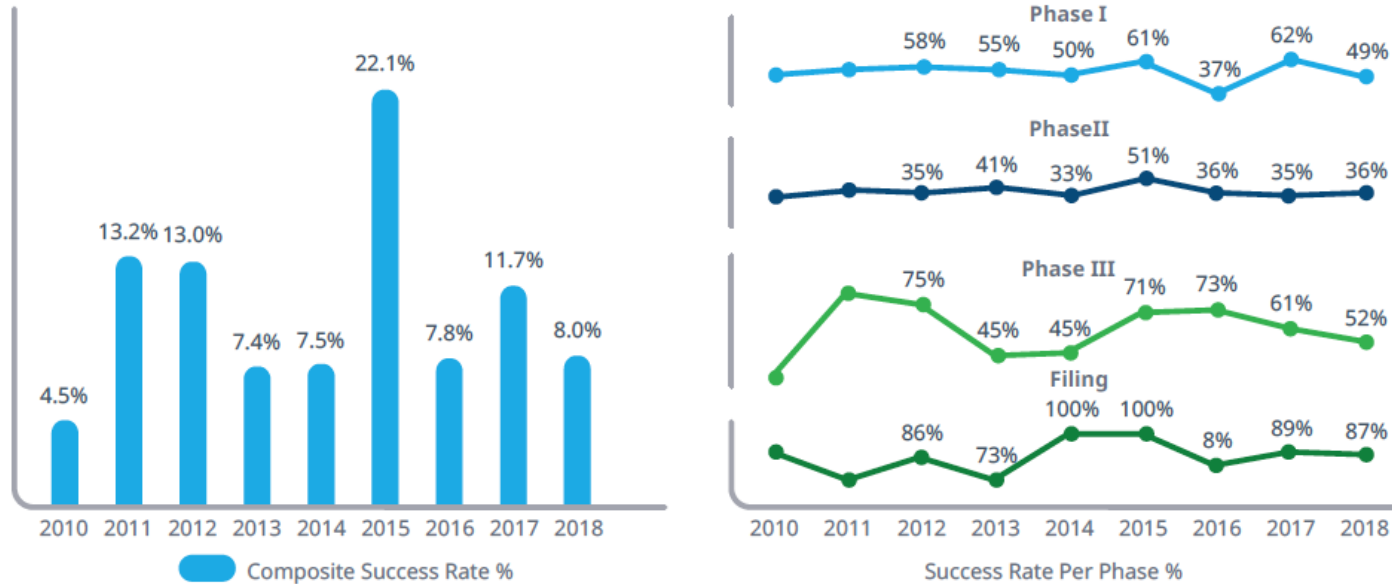
Number of treatment options over time for selected tumors (1996–2016)



Source: Drugs@FDA, Feb 2017; IQVIA, ARK R&D Intelligence, Feb 2017; IQVIA Institute, Mar 2018.

Oncology trials have high risk of failure

Oncology Trial Phase Transition Success Rate by Phase, 2010–2018



Source: IQVIA ARK R&D Intelligence; IQVIA Institute, Apr 2019

Functional testing to recapitulate drug responses

Patient-derived organoids model treatment response of metastatic gastrointestinal cancers

Vlachogiannis *et al.*, *Science* **359**, 920–926 (2018)
of the patients in clinical trials. **Our data suggest that PDOs can recapitulate patient responses in the clinic and could be implemented in personalized medicine programs.**



Hill *et al.*, *Cancer Discovery*, 2018

A Living Biobank of Breast Cancer Organoids Captures Disease Heterogeneity

Cell 172, 1–14, January 11, 2018

SCIENCE TRANSLATIONAL MEDICINE | RESEARCH ARTICLE

Patient-derived organoids can predict response to chemotherapy in metastatic colorectal cancer patients

Ooft *et al.*, *Sci. Transl. Med.* **11**, eaay2574 (2019) 9 October 2019

In vitro patient-derived 3D mesothelioma tumor organoids facilitate patient-centric therapeutic screening

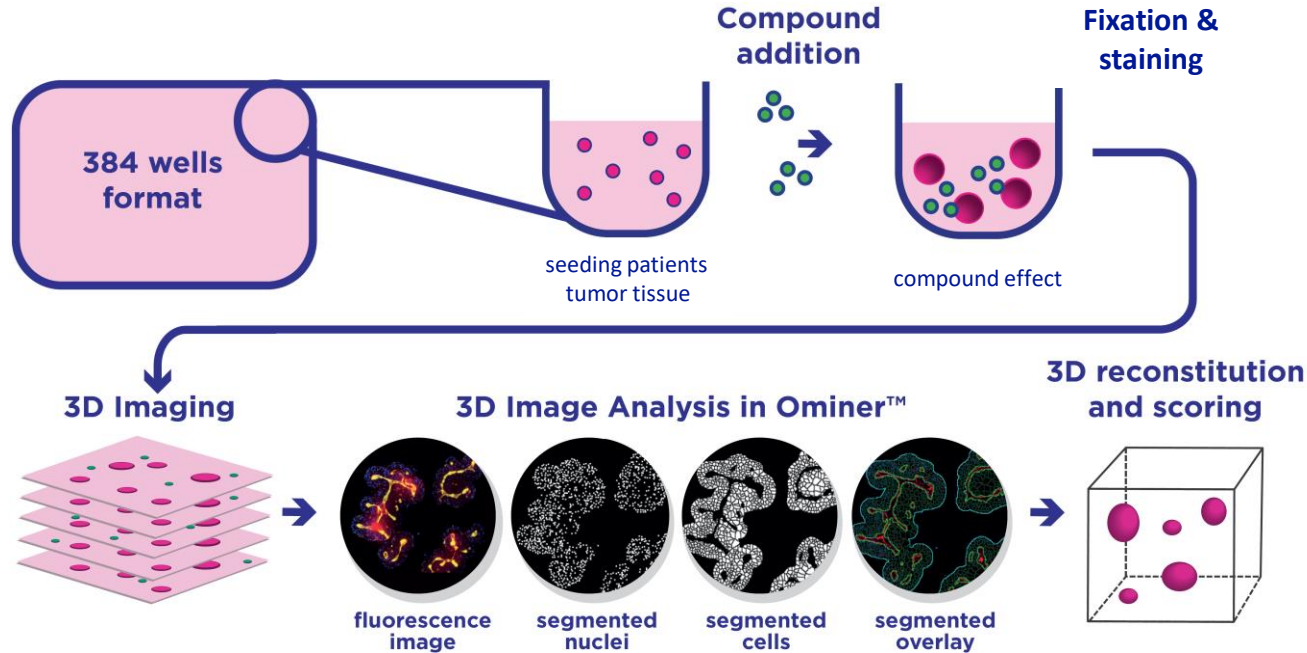
SCIENTIFIC REPORTS | (2018) 8:2886



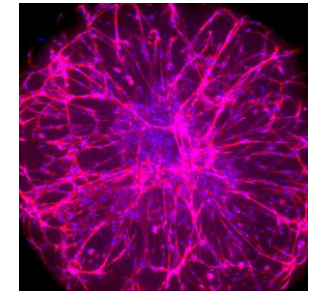
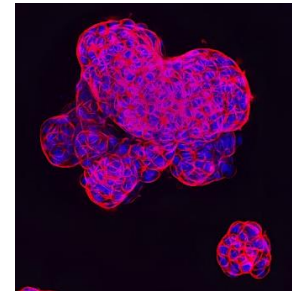
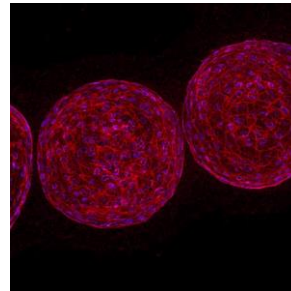
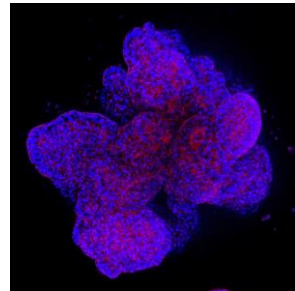
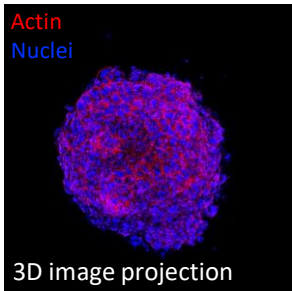
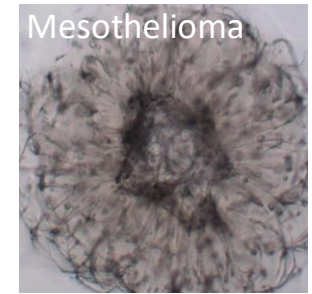
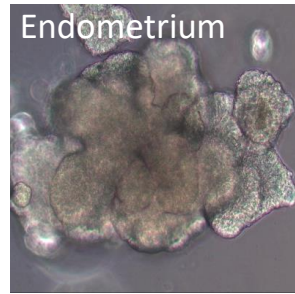
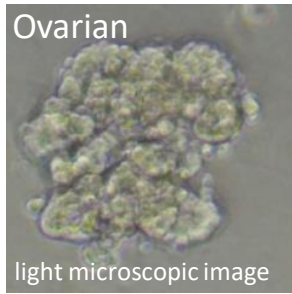
An organoid platform for ovarian cancer captures intra- and interpatient heterogeneity

Kopper *et al.*, 2019

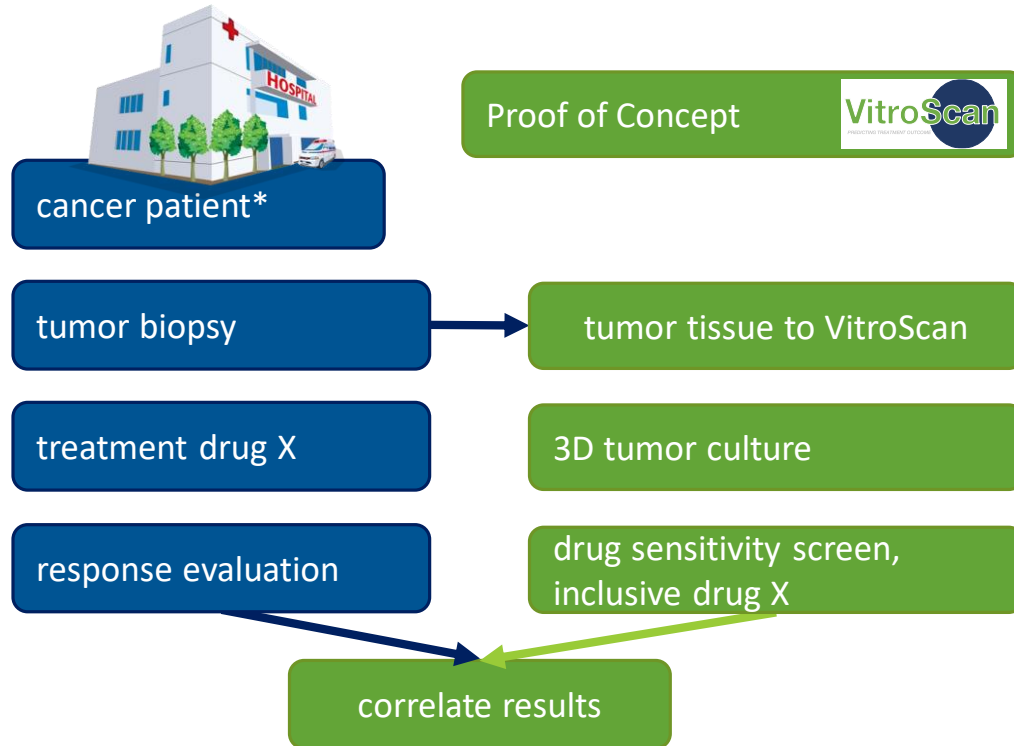
Ex vivo drug response platform



Potential to test all solid tumors

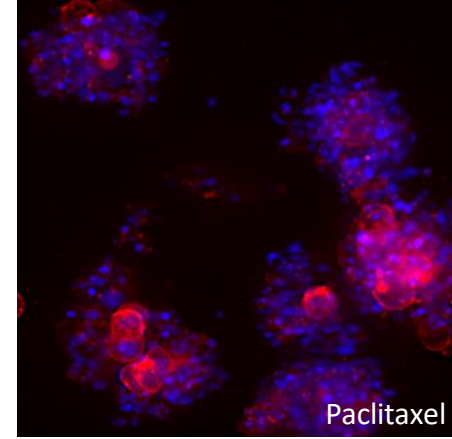
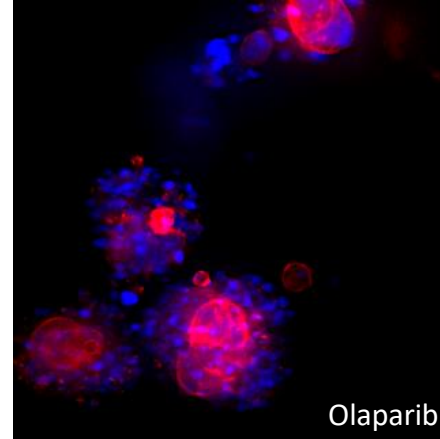
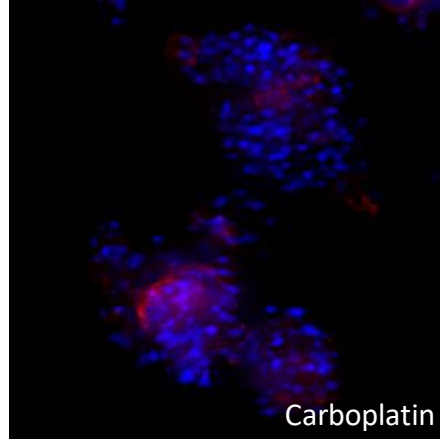
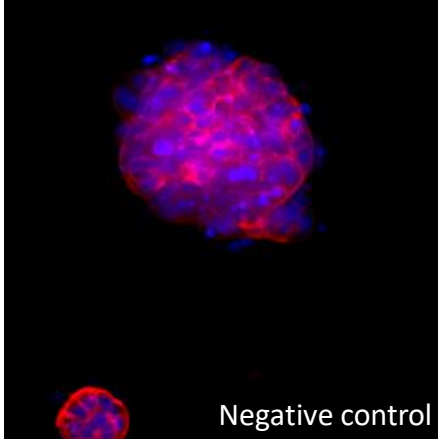


Outline Proof of Concept



*written informed consent

Ovarian cancer- patient specific drug sensitivity

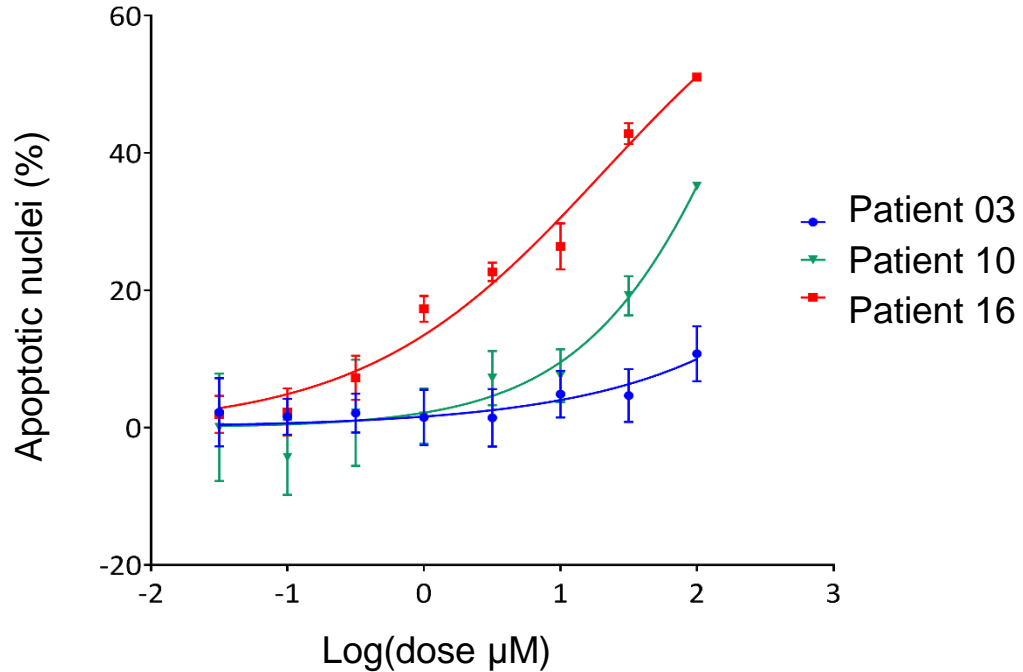


Conclusie cytology ascites:

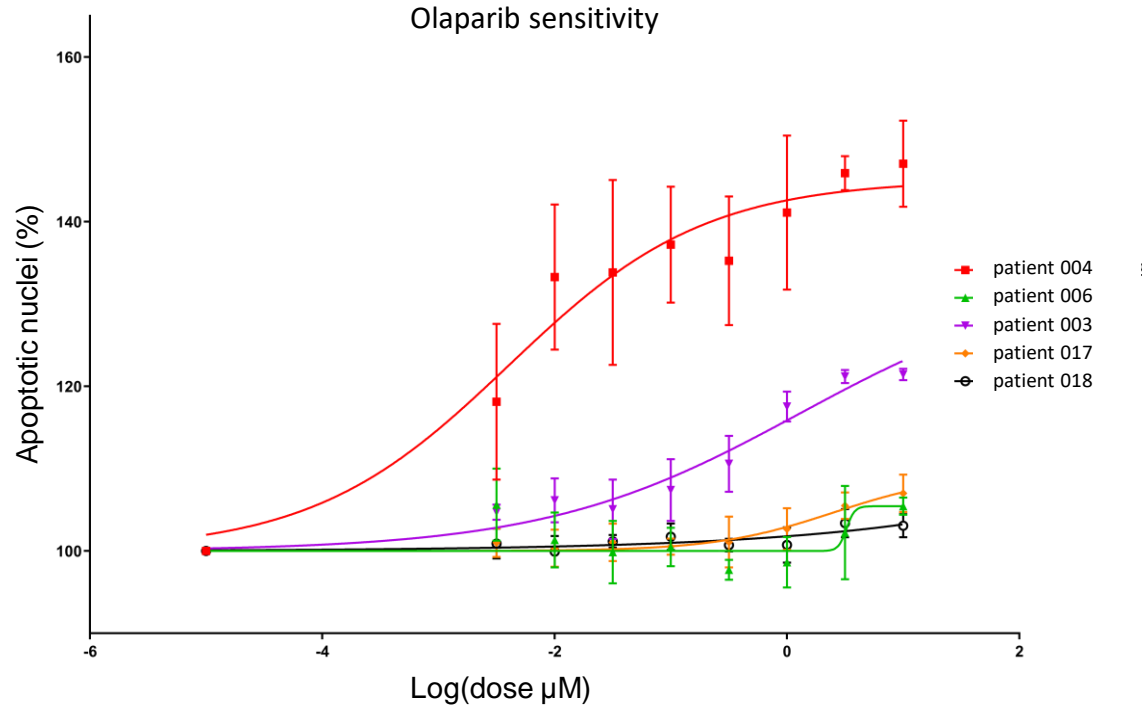
Ascites met maligne celbeeld. Er is lymfocytose aanwezig. Na immuuncytochemisch onderzoek mogelijk passend bij een metastase/localisatie van een adenocarcinoom van het ovarium. Oestrogeen-progesteron receptor negatief.

Aanvullend: BRCA2 mutant

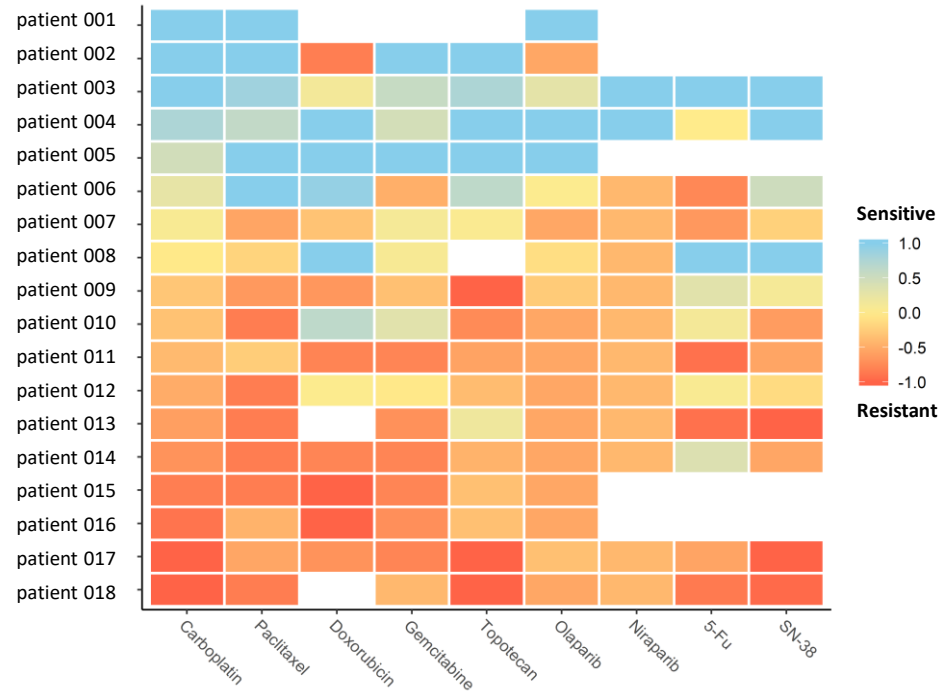
Variation carboplatin responses



Variation PARPi responses



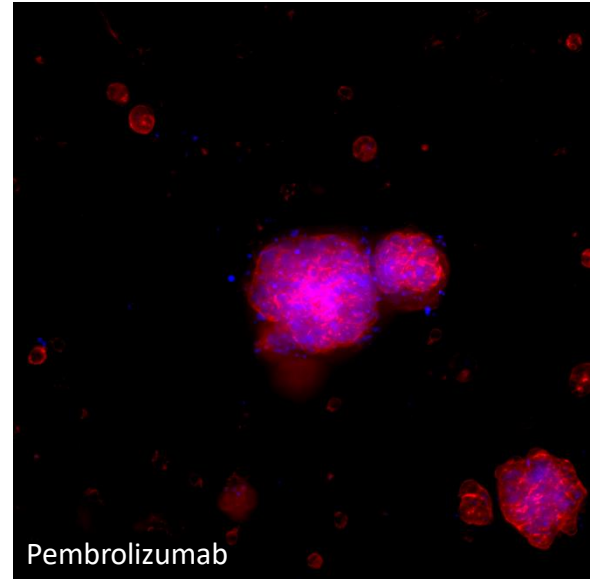
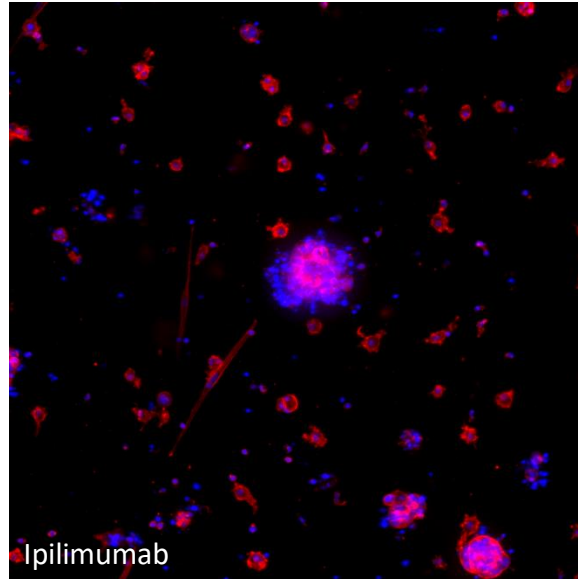
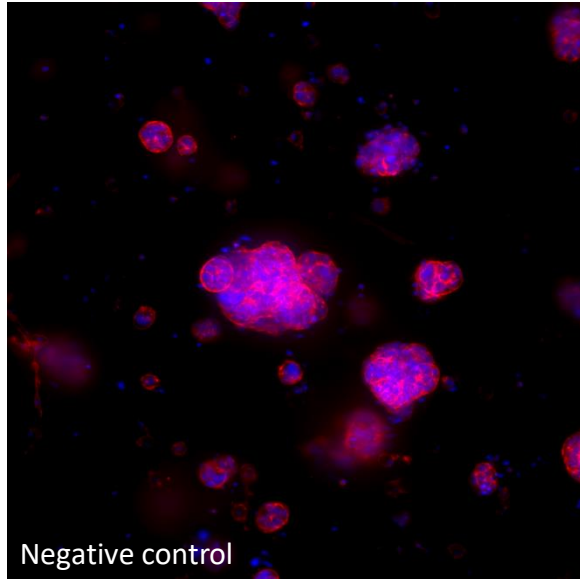
Patient specific sensitivity to standard of care



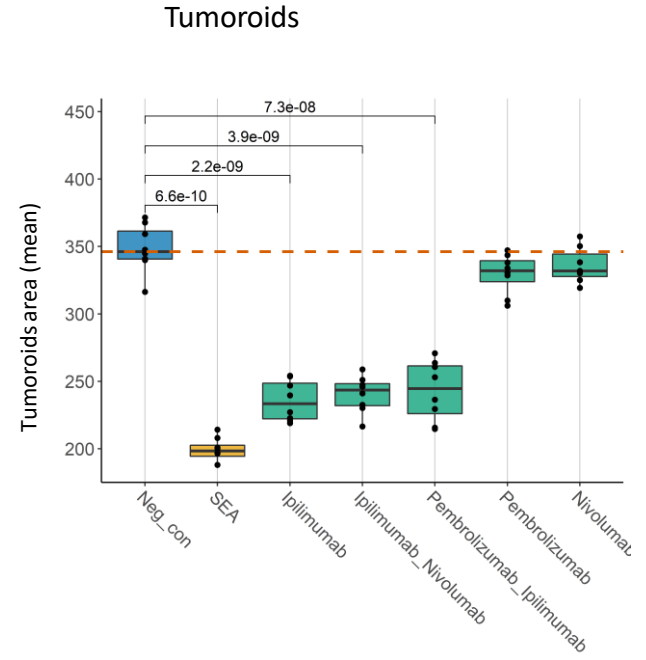
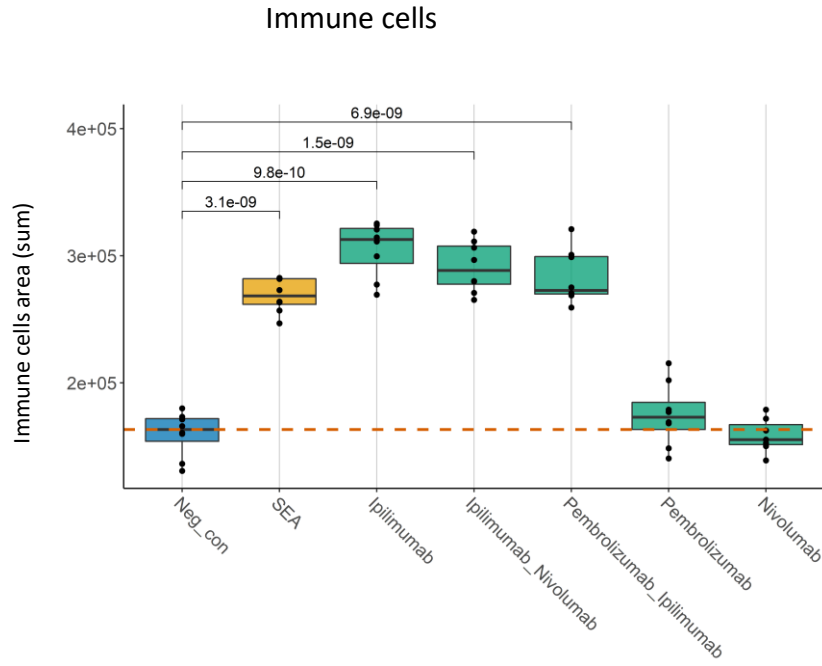
Heatmap:

- Colors represent deviation of AUC
- Selected set of features
- Relative sensitivity is ranked per drug

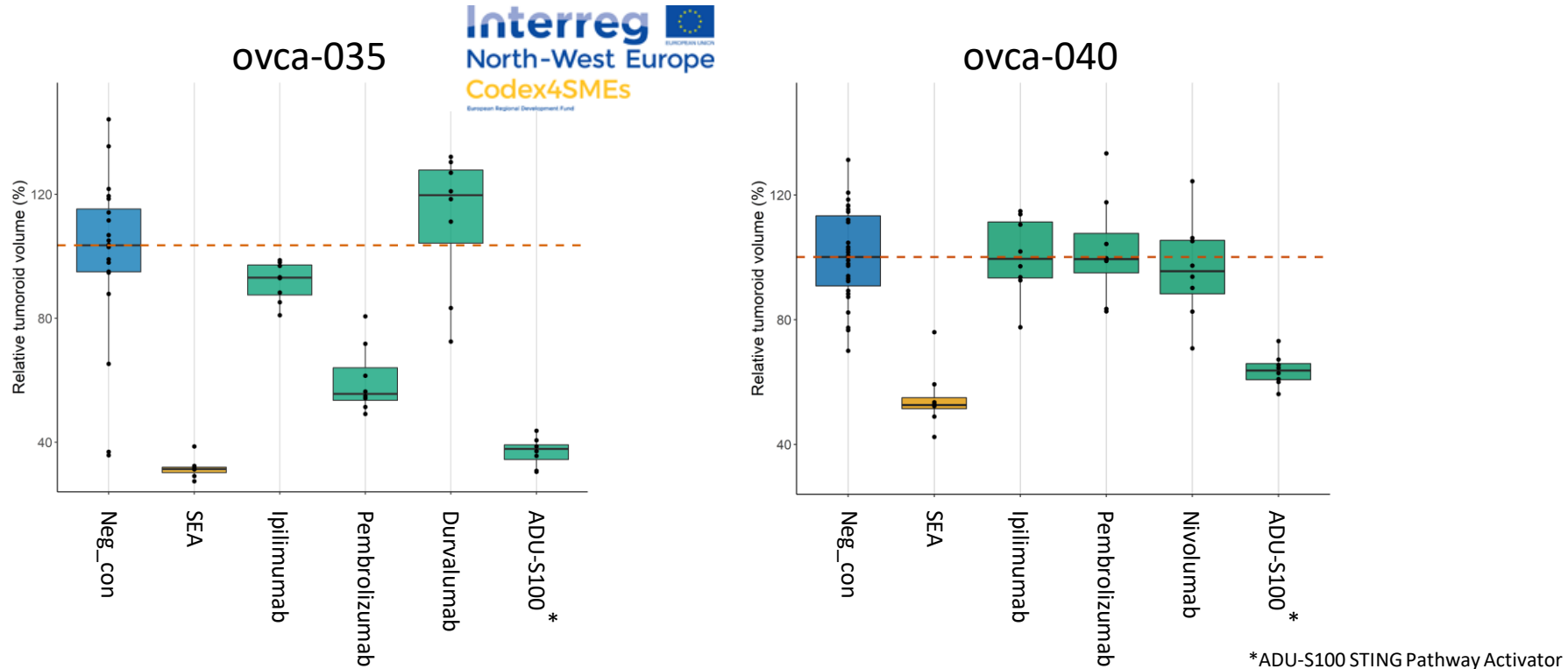
Can we predict the efficacy of immune drugs?



Ipilimumab response pattern



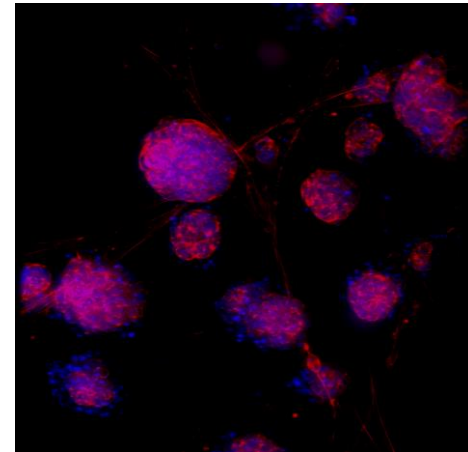
Pebrolizumab & STING pathway activator response pattern



Next stage...

- Deliver Proof of Concept for standard of care drugs
- In development: trials for novel (immune modulatory) drugs
 - Lung cancer
 - Ovarian cancer
 - Cervical cancer
- Increase success rate of clinical trials &

Offer the best drugs to patients!



Collaborators



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Radboudumc

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Pulmonology: Robin Cornelissen

Medical oncology: John Martens



Rijnstate



Nij Smellinghe
Ziekenhuis Drachten



Reinier de Graaf



VieCuri
medisch centrum



catharina
een santeon ziekenhuis



laurentius



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Contact

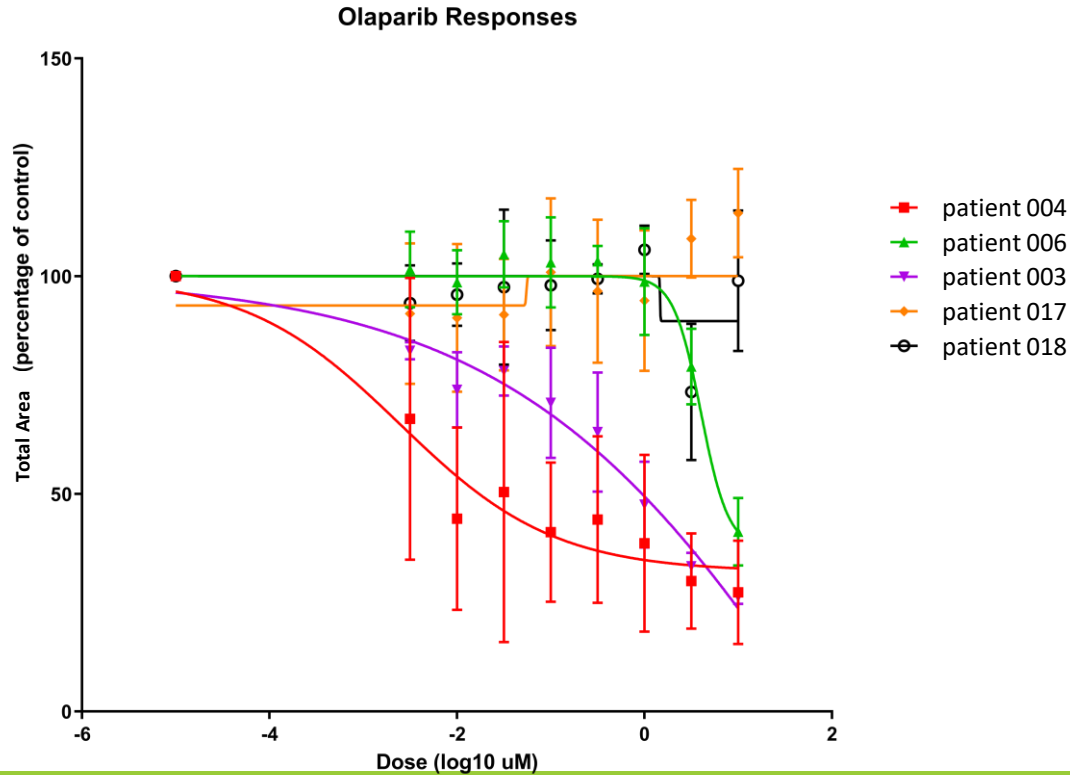


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Variation PARPi responses



Ipilimumab response pattern (cryopreserved)

