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Precision medicine using drug repurposing platform – the way forward in applying novel drug combinations for Ovarian Cancer treatment

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More than half of the women diagnosed with ovarian cancer ultimately succumb to death after 5 years of diagnosis. Standard platinum-based chemotherapy often results in patient relapse; thus, new therapeutic strategies are required. We aim to establish robust drug screening to pinpoint drugs and drug combinations that are effective in precision medicine for individual ovarian cancer patients. Ovarian cancer cells from 30 patients will be cultured for high-throughput drug screening against a library of clinically relevant drug combinations.

Thereafter, phospho-flow cytometry will be used to identify signalling pathway aberrations and potential biomarkers. This, together with drug screening data, will be used to create a directed phospho-flow screen on a smaller subset of drugs. The drug screening platform will be used to produce drug combination effects for selected drug screening which will be complemented by phospho-flow-based analysis used to characterise cellular heterogeneity and drug effect on ovarian cancers. The drug effects will be validated using functional bioassays and flow cytometry. With the implementation of direct drug sensitivity screening and effective drug combinations for precision cancer therapy, we are optimistic that this may provide relapsed and platinum- resistant ovarian cancer patients with individualised treatment plans.