Ovarian cancer is a histologically complex disease and the multiple sub-types are associated with different clinical outcomes. Our group has a longstanding interest in fundamental, translational and clinical research in epithelial ovarian cancer (EOC). We have established an extensive ovarian tissue repository and have developed unique EOC cell line models. Using these resources we have begun to interrogate the therapeutic responses associated with commercially available drugs such as the PARP inhibitors, as well as new compounds to therapeutic targets identified in our laboratory. In particular, we are focusing on the small GTPase Ran (Ras-related nuclear protein) and recent findings support the notion that a therapeutic index between normal and cancer cells can be defined with tumor cells being more sensitive to the loss of Ran function in comparison to normal cells. Results suggest that aneuploidy is associated with sensitivity to Ran, although additional anomalies also appear to contribute to response. Using an in silico based approach, we have identified with our collaborators two druggable scaffolds that have given rise to a drug development initiative. In parallel, we recently refined a microfluidic based system that can be used with microdissected tumor tissues to empirically test chemotherapeutic responses in tumor tissues. Here we also describe our recent advances in developing an ex-vivo chemotherapeutic platform for personalized medicine.