Towards a Canadian national program for comprehensive genomic profiling of treatment resistant cancers

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The application of "personalized" or "precision" medicine to oncology is a compelling concept based on the success of targeted agents in niche populations that express specific drug targets. To help stratify patients to therapies, single or multiple gene ("panel") tests are now done routinely in cancer laboratories around the world. At the BCCA and in a few other jurisdictions, panels are being complemented with larger scale efforts to assess the feasibility of whole genome analysis to inform treatment planning. In 2010, we reported the successful use of whole genome analysis to inform treatment planning for a rare cancer. This early experience, along with significant advances in technology, led to the launch of the POG pilot project in 2012. The aims of the pilot project were to assess the general feasibility of whole genome analysis in the context of an academic tertiary care cancer centre and to assess the uptake of whole genome technology by medical professionals.

The POG program has so far consented 1086 patients (including 109 pediatric cases) and completed analysis of 742 patients and 50 different tumor types. The majority of medical oncologists in the Province of BC have now enrolled cases in POG. Although oncologists considered the whole genome and transcriptome analysis to be actionable in 78% of cases, success in obtaining treatments for many POG patients lags behind. Our focus now revolves scaling the POG approach to benefit a broader segment of the cancer population in BC while generating data relevant to mechanisms of treatment response and failure.