**S1 Table: Assays used for validation by cohort**

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| --- | --- | --- | --- | --- |
| **Cohort** | **Diagnostic / Confirmatory Testing** | **Tumour Type** | **Technique** | **Gene(s)** |
| Retrospective: Cohort 1 | DiagnosticConfirmatory | CRCGISTMelanomaNSCLCCRCGISTMelanomaNSCLC | PyrosequencingSanger sequencingPyrosequencingFragment AnalysisPyrosequencingPyrosequencingSanger sequencingPyrosequencingPyrosequencingSanger sequencingSanger sequencing | *BRAF / KRAS**KIT**BRAF / KRAS**EGFR**EGFR / KRAS**BRAF**APC / CSF1R / CTNNB1 / MET / PIK3CA / TP53**KIT**KIT / NRAS**ATM / CSF1R / RET / STK11 / TP53**ATM / EGFR / PIK3CA / TP53* |
| Retrospective: Cohort 2 | DiagnosticConfirmatory | CRCGISTNSCLCCRC | Sanger sequencingSanger sequencingFragment analysisAlternative NGS assaySanger sequencing | *BRAF / FBXW7 / KRAS / NRAS / PIK3CA / TP53**KIT**EGFR**APC / ERBB2 / FBXW7 / FLT3 / KRAS / PIK3CA / TP53**ATM / GNAS / MET* |
| Prospective | Diagnostic | CRCMelanomaNSCLC | cobas cobascobas  | *KRAS**BRAF* *BRAF / EGFR / KRAS* |

Assay type and scope used with the different patient cohorts in diagnostic (i.e. testing prior to the Panel) or confirmatory capacities (i.e. testing performed to confirm novel mutations detected using the Panel).