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## RAS/MAPK GENE PANEL - TECHNICAL INFORMATION

**Design:** The Ras/MAPK gene panel was designed as part of a custom probe set from Twist Bioscience (TE-92106986 and TE-95970401) to cover 20 genes associated with Ras/MAPK pathway disorders such as Noonan syndrome, Costello syndrome and cardio-facio-cutaneous syndrome. This panel design provides coverage of 100% of the coding regions and flanking intronic sequences (+/- 15bp) for the 20 genes listed below.

**Method:** Library preparation and target enrichment was performed using the custom designed probe set (Twist Bioscience) and Nextera Flex for Enrichment (Illumina). Sequencing was performed using a 150bp paired-end sequencing kit on a MiSeq (Illumina). All stages of the workflow were performed according to the manufacturer's instructions.

**Coverage criteria:** For each sample reported, >95% of the target coding and flanking intronic regions of the 18 genes were covered to a minimum depth of 20 reads (20X). Specific details of coverage and depth for individual tests are available from the laboratory on request.

**Variant identification and interpretation:** Sequence data were mapped and variants identified using GenomeAnalysisToolKit (GATK) and NextGENe (Softgenetics) with hg19 (GRCh37) human genome as the reference. Variants identified were subsequently classified according to recent ACGS Best Practice Guidelines for Variant Classification using all available evidence. Any clinically significant variants were confirmed by Sanger sequencing.

**Variant reporting:** Variants were reported according to HGVS guidelines using the accession numbers listed below. Variants categorised as non-pathogenic, likely non-pathogenic or cold/cool VUS were not included in the clinical report. Details of these variants are available from the laboratory on request.

### Genes included and associated sequence accession numbers:

**BRAF** (NM\_004333.6); **CBL** (NM\_005188.4); **HRAS** (NM\_005343.4; NM\_176795.5); **KRAS** (NM\_033360.4; NM\_004985.5); **LZTR1** (NM\_006767.4); **MAP2K1** (NM\_002755.4); **MAP2K2** (NM\_030662.4); **MRAS** (NM\_001085049.3); **NF1** (NM\_001042492.3); **NRAS** (NM\_002524.5); **PPP1CB** (NM\_002709.3); **PTPN11** (NM\_002834.5); **RAF1** (NM\_002880.4); **RIT1** (NM\_006912.6); **RRAS2** (NM\_012250.6); **SHOC2** (NM\_007373.4); **SOS1** (NM\_005633.4); **SOS2** (NM\_006939.4); **SPRED1** (NM\_152594.3); **SPRED2** (NM\_181784.3).

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