Improved coverage uniformity with xGen Lockdown Panels

Customizable target capture panels decrease sample dropout, increase coverage uniformity, and lower turnaround time for maximum flexibility and performance

Prof Dr med Dr phil Torsten Haferlach at Munich Leukemia Laboratory (MLL) compared target enrichment and capture to amplicon-based assays for gene dropout and coverage uniformity. His research group works with hospitals, hematologists, and pharmaceutical companies, from all over the world to provide diagnoses and prognoses for leukemia and lymphoma patients using cytomorphology, cytogenetics, FISH, and molecular genetics. Patient samples are investigated by targeted next generation sequencing using either hybridization capture with custom myeloid and lymphoid panels manufactured by IDT and the xGen Exome Research Panel or amplicon sequencing assays (MPN, single amplicons). The researchers found that enrichment and capture technology reduced gene dropout and improved coverage uniformity. Even with a higher mean coverage, amplicon sequencing had greater gene dropout than hybridization capture (Figure 1).

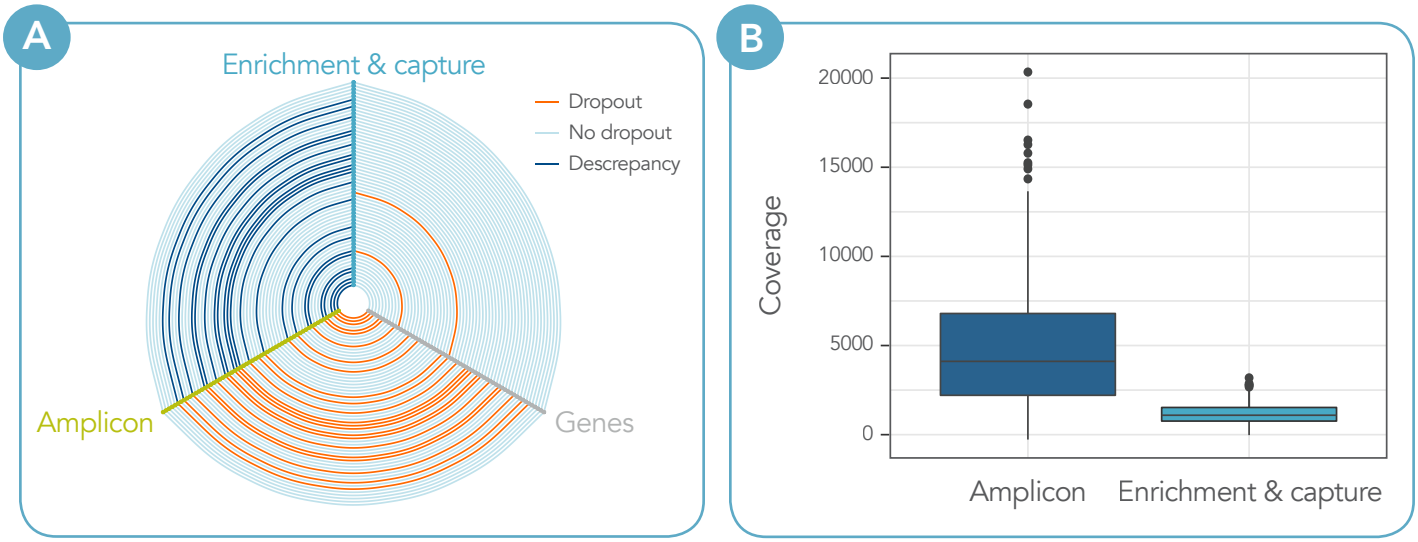

Figure 1. Greater uniformity of enrichment and capture–based libraries in NGS. Data are based on 94 samples. (**A**) Hive plot illustrating the dropouts in the enrichment and capture assay in comparison to an amplicon-based assay. Enrichment and capture has fewer gene dropouts than amplicon-based. If one region of a gene is dropped out, the complete gene is marked as drop out. Order of the genes from inner to outer: *ASXL1, ASXL2, ATM, BCL2, BCOR, BCORL1, BIRC3, BRAF, BTK, CALR, CEBPA, CSF3R, CSNK1A1, CXCR4, DNMT3A, ETNK1, ETV6, EZH2, FBXW7, FLT3, FOXO1, GATA1, GATA2, IDH1, IDH2, JAK2, KIT, KLF2, KRAS, MAP2K1, MPL, MYC, MYD88, NF1, NFKBIE, NOTCH1, NOTCH2, NPM1, NRAS, PHF6, PIGA, PLCG2, POT1, PTPN11, RAD21, RUNX1, SETBP1, SF3B1, SRSF2, STAG2, STAT3, STAT5B, TCF3, TET2, TP53, U2AF1, UBR5, WT1, XPO1, ZRSR2.* (**B**) Box plot illustrating the coverage distribution and mean within the complete panel (all genes). Enrichment and capture sequencing has greater uniformity of coverage than amplicon sequencing demonstrated by narrower coverage range. (Figure courtesy of Munich Leukemia Laboratory.)

"IDT custom xGen Lockdown Panels give us options and flexibility, so panels can be adjusted to the respective pharma company. Our accreditation status is not a barrier to IDT; we rely on IDT quality, so all samples run with IDT products still meet accreditation standards. When we moved over to IDT capture technology, there was a huge improvement in many parameters, including uniformity. The turnaround time is quicker because of the improved uniformity. Adequate coverage using IDT panels ensures that we do not have to repeat sequencing runs to cover specific areas of the genome. That makes a big difference in time to results."

Prof Dr med Dr phil Torsten Haferlach

Cofounder, Munich Hematology Practice and Munich Leukemia Laboratory,
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Custom xGen Lockdown Probes Pools

xGen Lockdown Probes are individually synthesized 5'-biotinylated oligos for hybridization capture enrichment in next generation sequencing. These probes can be used for creating custom capture panels that can be optimized, expanded, and combined with other panels. xGen Lockdown Probe Pools can also be used to enhance the performance of existing capture panels, rescuing poorly represented regions, such as areas of high GC content. Learn more at www.idtdna.com/CustomLockdownPanels.

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