Olink® Explore readout on NovaSeq™ 6000 SP vs NextSeq™ 2000/550

Background

The Olink® Explore platform enables protein biomarker analysis of your samples based on PEA technology coupled with NGS readout. When Olink® Explore was first launched, readout was performed on the high performance Illumina® NovaSeq 6000 Sequencing System using the S1 flow cell. Now Olink has expanded the alternatives of NGS instruments compatible with Olink® Explore and added the Illumina NextSeq 550 and NextSeq 2000 Sequencing Systems.

Previously, each sequencing run was performed according to a standard Illumina Sequencing Recipe in combination with the NovaSeq S1 flow cell with the Illumina control Library (PhiX) spiked into every Olink Library.

Definition
A **library** is a pool of DNA fragments with attached DNA adapters that are designed to interact with a specific sequencing platform.

Definition
The **flow cell** is the where the sequencing chemistry occurs. It is a glass slide that contains nano-wells. Each nano-well contains oligonucleotides that provide an anchoring point for the DNA adapters to attach to.

To be able to offer a faster and more simplified sequencing run at a reduced cost and without compromising on data quality, Olink has improved the workflow by introducing a Custom Sequencing Recipe together with Illumina. The Custom Recipe enables sequencing of Olink Libraries without the addition of control Library (PhiX), using the NovaSeq SP flow cell and the High Output and P2 flow cells for the NextSeq 550 and 2000.

Method

There were 216 samples used in the evaluation of the performance of Explore 1536 on the NovaSeq 6000 SP vs NextSeq™ 2000/550. More than half of these were from healthy, normal subjects. Twelve Olink® Explore 384 Libraries were prepared, three for each of the four panels included in an Olink® Explore 1536 Reagent Kit (Explore 384 Inflammation, Explore 384 Cardiometabolic, Explore 384 Oncology and Explore 384 Neurology). The twelve Olink Explore Libraries were sequenced, using NovaSeq 6000 SP vs NextSeq 2000/550. Samples were kindly provided by Prof. Mathias Uhlén (Royal Institute of Technology, Sweden).

Results

The NPX values between samples run using NovaSeq 6000 SP vs NextSeq 2000/550 were highly correlated as shown in Figure 1.
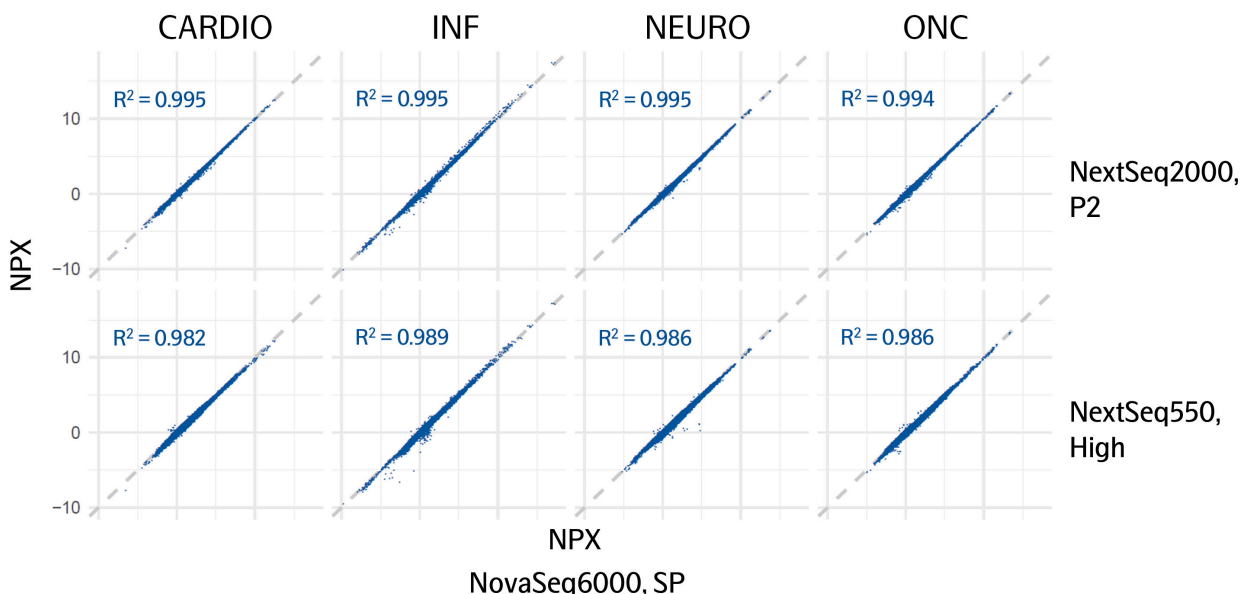

Figure 1 NPX results for 88 samples run on Olink® Explore 1536 with NovaSeq 6000 (with SP flow cell), NextSeq 2000 (with P2 flow cell) and NextSeq 550 (with High Output flow cell).

There were no block or panel effects identified.

The detectability for each assay was compared among the three instruments with their separate flow cells and similar results were attained, as shown in Figure 2.

These results show that NovaSeq 6000 with the SP flow cell gives the same quality of results as NextSeq 2000 and 550, and that the number of reads is sufficient when Olink Libraries are sequenced without the addition of PhiX.

If the cost-benefit outweighs the minor information loss, NextSeq 550 may be a favorable option.
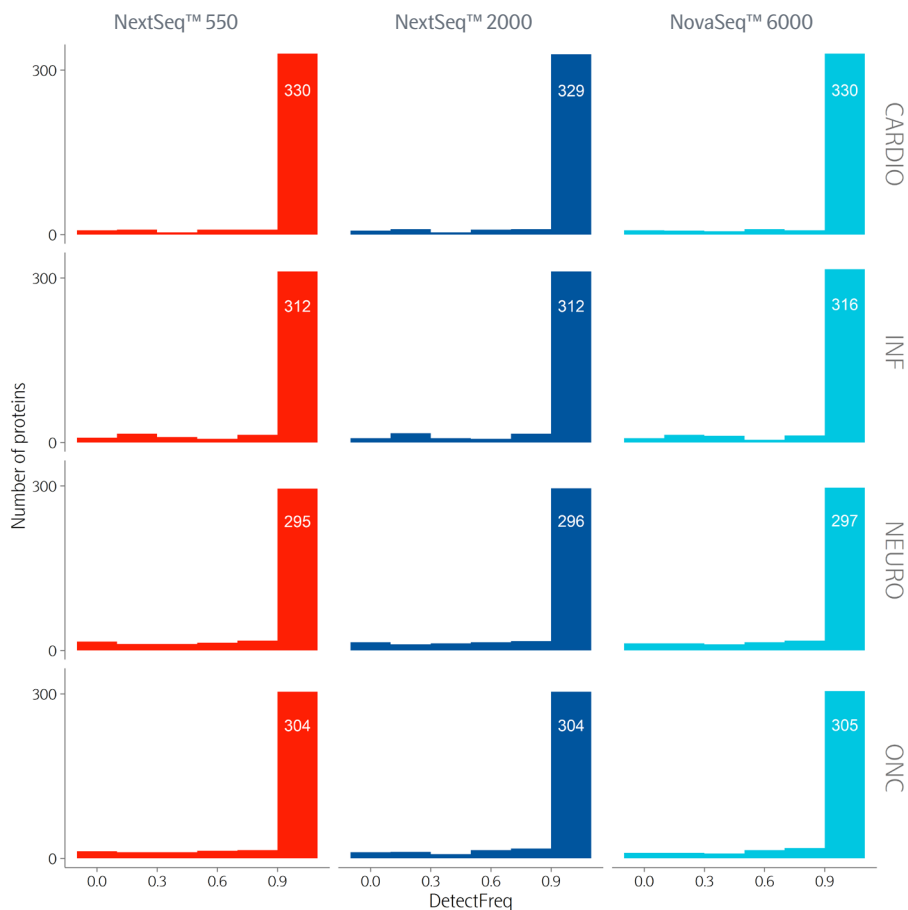
Figure 2 The detection frequency for the assays on the four different Explore 384 panels (Cardiometabolic, Inflammation, Neurology and Oncology).

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