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SHORT COMMUNICATION ARTICLE

AUTOMATION OF NEXT-GENERATION SEQUENCING SAMPLE PREPARATION

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ABSTRACT

To stay aware of interest for sample arrangement, numerous high-throughput sequencing labs have computerized specimen arrangement strategies. The point when selecting a robotization stage, clients might as well recognize the specialized exhibition of the fluid handler and its demonstrated exhibition for NGS test procedure. NGS test arrangement stages may as well offer clients a critical decrease in involved time and the adaptability to run numerous methodologies. In light of the fact that the sample readiness protocol for NGS are quickly developing, a perfect robotization framework ought to be good with reagents for different requirements on advancing sequencing stages.

KEYWORDS: NGS, genome sequencing, BenchCel Workstation, Benchbot Robot, Bravo platform, automation protocols

INTRODUCTION:

Next generation sequencing (NGS) has changed genomics, empowering whole genomes and exomes to be sequenced more proficiently than at any time in the past. The quick expand in sequencer speed and limit has made an expanding interest for high-throughput NGS test planning. Current library readiness strategies incorporate DNA/RNA purification, connector ligation, different quality control steps, and target-improvement steps. These strategies incorporate different redundant cleansing and pipetting steps that stance expense, throughput, and variability assessments. Conventional manual routines for specimen planning could be amazingly prolonged with various chances for mistake and high work overhead, and they make it challenging to generate imposing amounts of libraries.

To stay aware of interest for sample arrangement, numerous high-throughput sequencing labs have computerized specimen arrangement strategies. The point when selecting a robotization stage, clients might as well recognize the specialized exhibition of the fluid handler and its demonstrated exhibition for NGS test procedure. NGS test arrangement stages may as well offer clients a critical decrease in involved time and the adaptability to run numerous methodologies. In light of the fact that the sample readiness protocol for NGS are quickly developing, a perfect robotization framework ought to be good with reagents for different requirements on advancing sequencing stages.

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The Agilent Bravo fluid handling stage mechanizes library arrangement, permitting one research center technician to arrange entire genome libraries for up to 1,000 specimens for every week. The robotization can lessen variability in specimen planning. As indicated Figure 1, the NGS Bravo can diminish variability in library planning yield by just about 39%, contrasted with manual preparation.

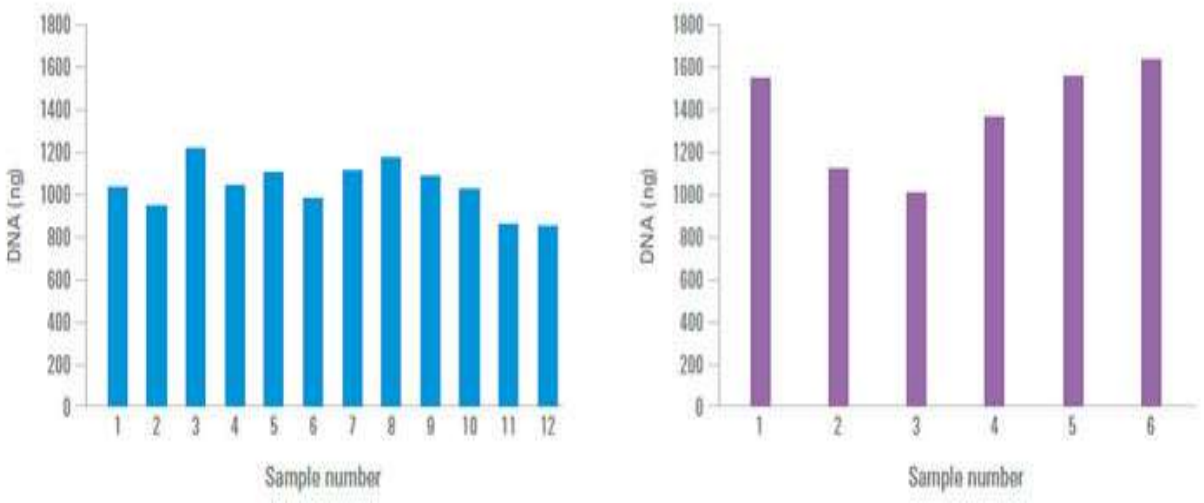

Figure 1: DNA yields in NGS libraries ready on the Bravo (left) show higher reproducibility as indicated by an easier coefficient of difference contrasted with manual preparation (right).

The Bravo platform is good with generally economically ready NGS reagents and sequencing stages. A graphical user interface is utilized to make methodologies, interface and configure devices, run methodologies, and screen progress. The adaptable scheduling programming decreases preparing time and research centers can scale up to completely robotized sample readiness in three days after instrument installation. By redesigning the framework with a BenchCel automated plate handler, the workstation maximizes research productivity by decreasing over 50 manual mediations to load lab ware throughout library preparation. Lab ware storage and a micro plate handling robot could be added to make a BenchCel Workstation, increments walk-away time. A Benchbot Robot might be utilized to make more perplexing or custom robotic configurations.

The Bravo stage characteristics streamlined computerization protocols for SureseleCTXT library preparation and target improvement with Illumina and SOLiD sequencers. Agilent has additionally developed methodologies for other standard NGS reagents. The Bravo stage has been indicated to be instrumental in scaling up to process 1,200 samples for every week.[1]

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