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An Overview of the Capillary Electrophoresis Process at the DOE Joint Genome Institute Production Genomics Facility: The Dual Operation of the AB 3730xl & GE MegaBACE 4500 DNA Sequence Analyzers

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At the center of the Department of Energy's (DOE) Joint Genome Institute (JGI) Production Genomics Facility (PGF), lies a highly efficient and automated production line devoted to the generation of high-quality genomic DNA sequence. The JGI utilizes a dual platform of DNA sequence analyzers within its Production Capillaries group: seventy Applied Biosystems 3730xl and thirty-six GE Healthcare MegaBACE 4500 instruments. The Capillaries group is comprised of eleven employees that are responsible for operating and maintaining both platforms; the group is also involved in the daily monitoring of performance stats and the troubleshooting of DNA sample and instrument related issues. The operation of these high-throughput fluorescence-based DNA sequence analyzers will be assessed on the strengths and benefits of each platform, including instrument overviews of operational parameters and mechanical/component specifications. In addition, instrument setups for production operation, operation schedules, loading, and maintenance strategies as well as the various sequencing strategies for each platform will be compared. Throughput numbers and sequencing quality results will be presented.