Molly Bray, Ph.D. - Director

Mission

The DNA Sequencing and Analysis Core provides automated sequencing and computer analysis services, as well as technical support. It also provides sequence detection and quantitation using real-time PCR assays. The Core operates automated DNA sequencing instruments with multi-capillary systems, a robotic liquid handler for automation capabilities, and a 7900HT Fast Real-Time PCR System. Trained personnel provide critical technical support to facilitate data acquisition and analysis.

Facility Description

The Core is housed in the McCallum Basic Health Sciences Building, Room 850. It currently operates three automated fluorescence-based multicapillary electrophoresis Genetic Analyzers. The laboratories are fully equipped and have access to shared capital equipment in adjoining common equipment rooms. These facilities include fume hoods; ultra-, superspeed-, table-top-, and micro-centrifuges; a cold room and warm room; table top and floor model environmental shakers; incubators; and four GeneAmp thermocyclers. The labs also include desk space for Core personnel and a conference room where Core managers can meet with users to discuss individual projects.

All major equipment is housed in room 852 of the McCallum facility. This equipment includes the following: two ABI 3730xl DNA Analyzers with a 96 capillary array; an ABI 3130xl Genetic Analyzer with 16 capillary array to provide a high throughput automated fluorescence-based DNA sequencing using capillary assisted electrophoresis; a Beckman Coulter Laboratory Automation Workstation (Biomek NX S8), which provides automated liquid handling operations for sequencing reaction set-up and clean-up; four GeneAmp PCR Systems (three dual 96-well 9700, and one 96-well 9800) Thermocyclers, which support all cycle sequencing and RT-PCR reactions that amplify DNA templates through the use of specific primers and Taq polymerase and cycling temperature steps; a Labnet centrifuge (HERMLE Z300), which supports the purification step of sequencing reactions that removes unincorporated dye-labeled terminators from samples that underwent thermocycler-assisted cycle sequencing; two Automated Environment SpeedVac Systems (Savant models AES1010 and DNA120-115), which dry cleaned sequencing reactions before they are re-suspended in an appropriate buffer and electrophoresed in the DNA sequencing instruments; and an ABI 7900HT Fast Real-Time PCR System, which detects and quantifies specific nucleotide sequences by using real-time PCR signal amplificaton as well as allele discrimination capabilities. High throughput quantitation and microarray data validation is supported using commercially available 384-well gene array plates.

Research Information

The DNA Sequencing and Analysis Core provides the latest automated DNA sequence analyses using the dye-terminator methodologies with readouts of 700-800 bp (ABI 3130xl DNA analyzer) and 900-1,000 bp (ABI 3730xl DNA Analyzer). The high accuracy of the base calling (98.5%) and low ambiguity (1 ul per sequence reaction (see guidelines on LIMS - http://www.seqcore.uab.edu/). For other kinds of templates, please contact the Core. Turnaround time is two days. Cost of running the 9700HT Real-Time PCR instrument (the Core does not provide reagents and plasticware) is $40 per run, regardless the number of test wells per plate.

Reaction Submission

DNA Sequencing Core users can now submit sequence requests and retrieve results online via our recently implemented laboratory information management system, dnaLIMS. For detailed instructions on the use and capabilities of this new system, please contact Maria Salazar and/or visit http://seqcore.uab.edu/ .

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