

**2000-2001  
SUMMARY OF ACTIVITIES  
BIOPOLYMER LABORATORY**

The Biopolymer Laboratory serves as a core facility for molecular biology research. It is equipped to provide support for a wide range of projects involving nucleic acid research.

### **DNA SYNTHESIS**

DNA synthesis is accomplished with two instruments: an Applied Biosystems Model 381A and a Beckman Model 1000M. The ABI 381 is a single column instrument dedicated to the synthesis of specialty DNA. The Beckman 1000M is a fully automated synthesizer with a built-in Trityl monitor and extensive diagnostic functions to monitor the synthesis process and ensure the quality and purity of the synthesized oligonucleotides. It has the capability to synthesize 8 oligonucleotides sequentially with fast and economical cycle time. DNA of defined sequence is custom-made automatically using solid phase/phosphoramidite chemistry. Synthetic DNAs are used as probes for gene screening, primers for DNA sequencing, and in directed site mutagenesis.

### **DNA SEQUENCING**

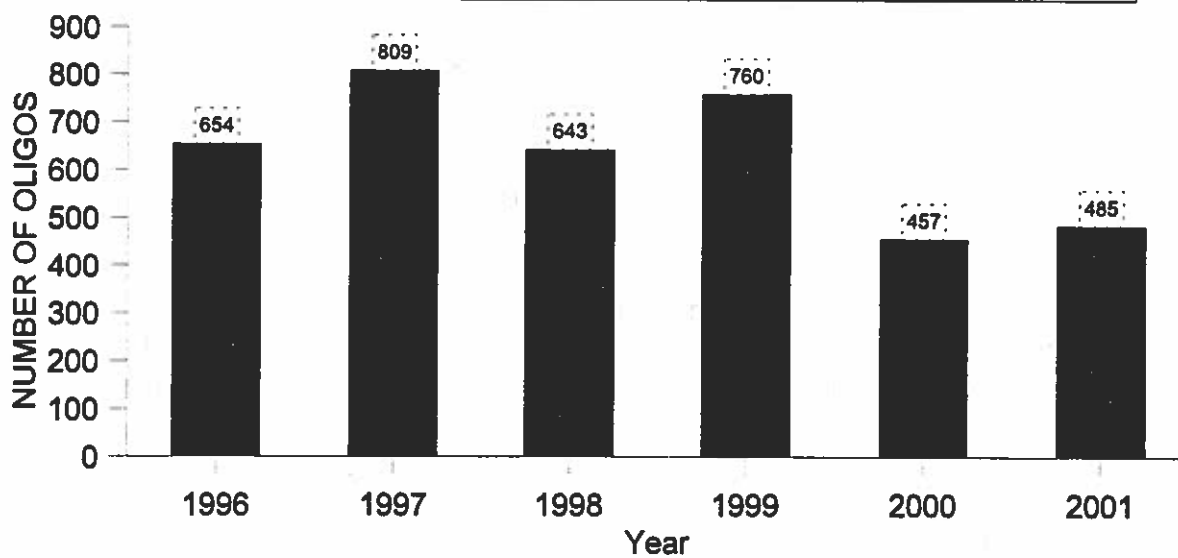
The Biopolymer Laboratory performs DNA sequencing analysis using the automated sequencer model ABI 373XL from Perkin Elmer/Applied Biosystems. The use of the "Big Dye" technology by Applied Biosystems has allowed more accurate and long reads in automatic sequencing. The completion of the sequencing of the human genome and other genomes have drastically reduced the demand for DNA sequencing. The number of DNA templates sequenced during the fiscal year 2000-2001 is down 50% from last year. The technology remains in use mainly to detect mutations and to confirm the genes' locations.

## **MICRO-ARRAY TECHNOLOGY**

The advent of the human genome project has drastically changed the landscape in all areas of biomedical research. Massive amounts of sequence data are now widely available to researchers. In response to this progress, a new DNA microarray system has been installed in a dust free and climate controlled room in the CSAB building. The printing of custom DNA arrays on glass slides is performed on a Microsys 5100 arrayer from Cartesian Technologies. The fluorescence scanning is carried out on a three laser scanner, the ScanArray 4000XL from Packard BioScience. The Image and gene expression analysis are processed with the QuantArray software also from Packard BioScience. This new technology will allow USA scientists to interrogate thousands of genes simultaneously. The microarray technology is fast becoming the tool of choice for basic research and medical diagnostics.

In addition to the services mentioned above, the Biopolymer Center can provide biotechnical advice to all researchers using the facility. Technical files on strategies for molecular cloning and the latest developments in Biotechnology are available upon request. For further information contact Dr. Tin Cao at 460-7264.

## DNA Synthesis in Biopolymer Lab



## DNA Sequencing in Biopolymer Lab

