THE Ames Laboratory

Creating Materials & Energy Solutions

Multiplexed Capillary Electrophoresis

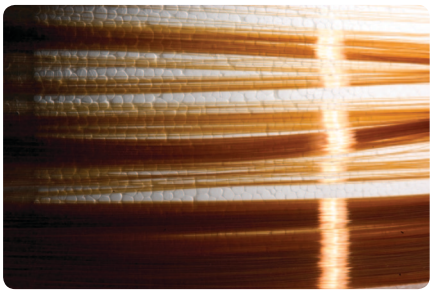
- Key analytical tool for DNA analysis, enabling technology for the Human Genome Project.
- Developed in a 1998 Basic Energy Sciences project at the Ames Laboratory.
- Winner of four R&D 100 Awards.
- Marketed first by SpectruMedix, Inc. and later by Applied Biosystems.

Basic Energy Sciences-funded research at the Ames Laboratory brought one of the most important bioanalytical technologies of the last 10 years to the marketplace.

The breakthrough followed a group of scientific publications and a key patent developed by Ames Lab scientist Ed Yeung and his coworkers. The technology is a DNA sequencer based on capillary electrophoresis and fluorescence detection. The key inventions are the innovative, highly parallel optical detection designs for fluorescence coupled to novel, high-speed separation schemes that provide simplicity, ruggedness, sensitivity, low cost and broad applicability. This invention has already significantly impacted the understanding of the origin of diseases, facilitating early diagnosis and the design of new clinical therapeutics.

Ames Laboratory's technology is now the "gold standard" of DNA sequencing instrumentation and is found in virtually every DNA sequencing and genetic analysis laboratory. The DNA sequence defines the genome, which is essentially the roadmap of all biological functions, including diseases.

Not only did this technology play a role in the success of the Human Genome Project, but the current and future use of such genetic information is also greatly facilitated. Furthermore, the invention allows high-speed, high-throughput characterization of proteins, metabolites and pharmaceuticals that are the next frontiers for understanding and maintaining human health. Exponential growth in this area is unavoidable because of the complexity of proteins, the success of combinatorial drug development and the push for personalized medicine. With its broad range of applications, the economic and the social impacts of this work will remain highly significant.



Fine glass capillaries like these allow for quick, accurate chemical analysis of substances using a technology known as multiplexed capillary electrophoresis that was developed at Ames Laboratory.

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