

NIJ and NetBio—Advancing Rapid DNA Analysis

Bringing Automated Short Tandem Repeat Analysis to Forensics



"The NIJ was the first group to really give us a chance, to believe that there was something to our vision, and the NIJ grants that we were awarded were major building blocks in our development."

Richard Selden
CEO
NetBio

Synopsis of Problem and Solution

Today, most DNA analysis methods require expert users in a controlled laboratory environment and take weeks to months from sample collection and transport to the generation of results. This slow process hinders the efficacy of using DNA within the criminal justice system.

Using research grants provided by the National Institute of Justice (NIJ), NetBio of Waltham, MA, developed a Rapid DNA Analysis (RDA) system that is much faster at developing DNA profiles than traditional methods and can be utilized by a nontechnical operator outside the laboratory. Essentially, the system enables law enforcement agencies to quickly process DNA samples in a police station or laboratory, thereby helping to accelerate the criminal investigation process. These benefits could ultimately solve more crime, solve crimes faster, and potentially reduce recidivism.

Benefits

- Speeds up the process of DNA analysis with an output rate of 5 DNA samples per 85 minutes
- Helps reduce backlogs by processing database samples at the point of collection
- Based in a single-use, self-contained cassette to minimize the potential for contamination and sample mix-ups
- Designed to be used in the field and at the booking station, allowing law enforcement to run a suspect's DNA against unsolved cases while holding them in custody
- Designed to be used by a nontechnical operator, making the need for an on-hand DNA expert unnecessary

The Future

- As use of RDA systems continues to grow, the technology will continue to mature, enabling greater benefits to the forensics community.
- NetBio predicts that RDA will become much more integrated with other biometrics.
- The use of RDA systems in the forensic community has potential to be the model for future integration in clinical diagnostics.

NIJ-Funded Research

NetBio, a leading provider of technologies and products for the emerging field of RDA, was awarded NIJ grants to assist in the development of a fully automated, fully integrated, Short Tandem Repeat (STR) RDA profiling instrument. Additionally, NIJ grants were awarded to develop low copy number (LCN) analysis components that can be integrated into the RDA instrument. LCN analysis is based on developing an STR profile from only a few cells.

NIJ grants allowed NetBio to develop the basic modules of the RDA system. NIJ also exposed NetBio to forensic thought leaders and practitioners. Taken together, NIJ played a fundamental role in NetBio's development. As NetBio's RDA products begin to be utilized routinely, NetBio has the potential to have a major impact on societal safety, to continue to innovate, and to become a successful and growing business.

Bringing Research to Practice

- In October 2012, NetBio launched its RDA system ANDE, or Accelerated Nuclear DNA Equipment. It is being commercialized by NetBio for a variety of rapid DNA applications in military and homeland security markets. DNAscan is being commercialized by NetBio's partner, GE Healthcare, for the law enforcement community.
- In 2014, NetBio and GE announced a multi laboratory developmental validation of the DNAscan RDA system. Leading U.S. and international accredited National DNA Index (NDIS) participating forensic laboratories are evaluating the system to seek NDIS approval.
- The promising results of the NIJ-supported LCN research led to additional funding from the United States Department of Defense.
- NetBio has been actively engaged in the transition process of the LCN technology and plans to commercialize the product in 2015.

More Information

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NetBio's DNAscan RDA system resulted from NIJ's support funding and is designed to be used in the booking station by non technical personnel.