



**MIKE DEWINE**  
OHIO ATTORNEY GENERAL



**Battelle**  
*The Business of Innovation*

## Frequently Asked Questions

### Ohio Bureau of Criminal Investigation and Battelle Next Generation Sequencing (NGS) DNA Technology

#### **Why are BCI and Battelle working together?**

The Ohio Attorney General's Bureau of Criminal Investigation (BCI) and Battelle are working to implement next generation sequencing (NGS) in the BCI forensic laboratory in London, Ohio. This new technology will be used in missing persons cases.

#### **What does the project involve?**

Battelle has spent five years implementing NGS technology in the field for the U.S. Department of Defense and was chosen to lead a National Institute of Justice (NIJ) project evaluating NGS methods in forensic labs around the country.

The project between BCI and Battelle leverages Battelle's NGS expertise and experience to implement the technology in compliance with BCI's forensic laboratory accreditation requirements. The technology will be used only in missing persons cases after the validation process and if the FBI approves the NGS technology data for entry in the Combined DNA Index System (CODIS) for missing person samples.

#### **What is next generation sequencing (NGS)?**

NGS refers to a range of new technologies that have revolutionized genomic research over the past decade. Also known as Massively Parallel Sequencing (MPS), NGS enables millions of fragments of DNA from a single sample to be sequenced in unison rather than one at a time.

#### **What are the benefits of NGS technology?**

For Ohio families, NGS technology can bring answers about their missing loved ones and shed new light on cases previously considered unsolvable. Compared to traditional DNA testing methods, NGS is significantly faster, more sensitive, and allows for more detailed information to be generated from DNA.

There are three main types of DNA sources that require DNA testing in missing persons cases: testing of unidentified human remains (such as skeleton or bones); testing of samples from a missing person (such as a toothbrush or teeth); and testing of DNA from family members of missing people.

Currently, specialized DNA testing is necessary in most missing persons cases, which BCI sends to a federally-funded lab out-of-state and results may take up to six months. With this partnership, NGS testing will be done at BCI, which would speed up results. And while the current specialized DNA testing does not always return a result if samples are extremely degraded, NGS testing can often do better and return a DNA profile.

NGS technology also has the potential to provide information, from DNA alone, on individuals' traits including hair color, eye color, and other facial features, which may assist in generating law enforcement leads.

### **What is the impact for missing persons cases in Ohio?**

The Ohio Attorney General's Office includes BCI's Missing Persons Unit. Ohio currently has approximately 600 missing children and 600 missing adults in the BCI Missing Persons Unit database and 118 long-term missing people in the BCI Project LINK (Linking Individuals Not Known) Program.

Currently in Ohio, family members of long-term missing persons (missing 30 days or longer), can submit DNA (through their local law enforcement agency) to the Project LINK Program. Usually loved ones' DNA is sent out-of-state for mitochondrial DNA testing, a very specialized test BCI does not currently perform.

In most cases unidentified human remains also must also be sent out of state for mitochondrial DNA testing. It can take up to six months to return results. The results are then entered into a national database to try to find a match.

Implementing new technology for faster and better forensic investigation is a priority for BCI. NGS is the next logical step in continuing BCI's mission to serve Ohio families.

### **What does Battelle provide?**

Battelle provides experts in NGS and forensics, NGS instrumentation, reagents, and software to educate and train BCI forensic scientists on the technology. Battelle experts are also working directly with BCI forensic scientists to validate NGS in BCI's London, Ohio laboratory.

### **What does BCI provide?**

BCI provides expertise in forensics, an internationally accredited (American Society of Crime Laboratory Directors/Laboratory Accreditation Board) forensic laboratory, NGS reagents, and qualified forensic scientists to ensure NGS technology is validated and implemented in accordance with BCI's forensic accreditation.