

# BioTrust Research Report

January 2014, 2nd Edition



The BioTrust Research Report highlights research using blood spots in the Michigan BioTrust for Health (BioTrust). The purpose of this report is to ensure you understand how blood spots are being used in medical and public health research.

15 researchers applied to use blood spots in 2013. So far, 13 have completed the review process and been approved.



## Blood spots are used to study hearing!

Blood spots can be very useful because they provide a snap-

shot of a baby's prenatal world (environment). Researchers can use blood spots to look at prenatal exposures and resulting effects on a newborn. In some cases, this may help guide care and lifestyle choices for a pregnant mother and newborn. One study approved in 2013 is assessing the effect of heavy metals, like lead, on hearing loss in newborns. In the past, higher blood lead levels have been reported in children living in different parts of Michigan. This study will help reveal if these levels and levels of other heavy metals have an effect on newborn hearing.



## Improving Newborn Screening (NBS)

NBS is done on almost every baby shortly after birth to find rare disorders that need early treatment. Blood spots are used to improve NBS programs. An example of this is a study that

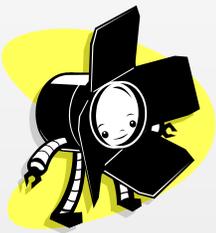


is testing a different method of screening for metabolic disorders. Metabolic disorders are due to a genetic change often inherited from both parents. The body is then unable to break down and use or store the energy from food properly. NBS allows metabolic disorders to be detected as soon as possible. This can save or vastly improve a life.



## Improving Cystic Fibrosis Newborn Screening (NBS)

Cystic fibrosis (CF) is an inherited disorder caused by a gene change that disrupts the normal flow of salt and water in and out of our body's cells. Thick mucus then builds up, affecting the lungs and digestive system. The Wisconsin NBS program has created a Great Lakes Consortium with Illinois, Indiana, Michigan and Minnesota to assess a new method for CF newborn screening using stored blood spots. The method will test for more forms of the CF gene change which could lead to a different method of reporting positive (abnormal) results. The new method may reduce the number of newborns requiring follow-up sweat testing.



# Epigenetics Spotlight

More blood spots are being used in epigenetic studies. Epigenetic studies may look at how a person's genome (the body's complete set of DNA) is switched on and off rather than looking for specific changes in the DNA code itself. At various times inactive segments of DNA (genes) are tightly wrapped so that they are essentially *turned-off* while active genes are unwrapped and *turned-on*. Many factors such as behavior, diet, and toxins can impact this process and have effects on our bodies without changing the underlying DNA code itself.

One study is looking at genetic and epigenetic processes to see if there are changes that can be related to differences in how twins perform tasks involving working memory and attention. Families are asked permission to have children involved in this study including use of their blood spots.



Another epigenetic study is looking at changes in gene expression in blood spots from newborns conceived through assisted reproductive technology (ART). This study will help find out if healthy newborns may still have epigenetic changes that could have effects later in life. This is important information for parents and physicians when discussing the pros and cons of ART.

Much of the work using Michigan's blood spots is still on-going, thus results are not yet available. Personal results from research are not returned, but further details about these studies can be found at [www.michigan.gov/biotrust](http://www.michigan.gov/biotrust) or by calling 517-335-6497.