



Research Use of Dried Blood Spots Approved by the Michigan Department of Health and Human Services (*updated May 2016*)

Any blood spot used in approved health research is released only if:

- Consent was granted for use through the BioTrust (blood spots collected after April 30, 2010), *or*
- Waiver of informed consent was granted by MDHHS Institutional Review Board (blood spots collected between July 1984 and May 1, 2010) and no opt-out directive has been received, *or*
- Additional informed consent for use in a specific research study was obtained

2016 Approved Research	
Development of Newborn Screen for Niemann-Pick C1 Disease	
Institution/Agency	Washington University
Year Approved	2016
Samples Requested	20, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	Pending. No samples released to date.
Study Summary	Niemann-Pick C (NPC) disease is a progressive, neurodegenerative disorder. NPC results in a buildup of cholesterol in cells, which, in turn, destroys neurons. Difficulty making the diagnosis (>5 years) leads to significant delays in treatment. NPC is an excellent candidate for newborn screening because therapies are available or entering into clinical trials that modify the disease. There is potential to reduce long-term morbidity and improve quality of life. These researchers have developed a fully-validated newborn screen for NPC. To further validate the screen, they will use blood spots from NPC patients from ~20 states including Michigan.
Determination of dried blood spot-derived DNA yield, quality, and next-generation sequencing capacity for applications in newborn screening	
Institution/Agency	Veritas Genetics
Year Approved	2016
Samples Requested	42
Year Released	Pending. No samples released to date.
Study Summary	Targeted next-generation sequencing (NGS) of genes commonly associated with newborn illness promises to provide benefits to newborn screening by reducing costs and improving patient outcomes. The utility of blood spot-derived DNA must be validated for use in new genetic testing such as NGS. This study will use blood spots to test the suitability of blood spot-derived DNA for NGS. They will test two different DNA extraction methods that vary in handling and age. DNA yield and quality will be measured and the extracted DNA assessed for suitability in NGS assays.

2015 Approved Research	
Genetic Analysis of Human First Trimester Trophoblast in Ongoing Pregnancies	
Institution/Agency	Wayne State University
Year Approved	2015
Samples Requested	50, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	2015
Study Summary	This study is using blood spots to help determine if a new method of prenatal genetic diagnosis is informative. The method retrieves a type of cells, called trophoblasts, from a woman's cervix as early as 5 weeks gestation. Chromosomes in trophoblast cells from recruited patients are currently being evaluated. Patients recruited in the study have



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	consented to allow extraction of DNA from their newborn’s blood spots to compare with the DNA of the trophoblasts.
Collection of Confirmed Positive Specimens for Evaluation in a Clinical Study to Establish Screening Performance of the PerkinElmer NeoBase2 Non-Derivatized MSMS Test System for Inborn Errors of Metabolism	
Institution/Agency	PerkinElmer
Year Approved	2015
Samples Requested	5
Year Released	Pending. No samples released to date.
Study Summary	De-identified blood spots from newborns diagnosed with certain metabolic conditions detected by newborn screening are used for a method comparison study. This type of study is done to determine if this company’s new testing technology performs as well or better than the current testing. This could help improve current laboratory tests used to detect disorders through newborn screening.
The Impact of HepG2 Dnase I hypersensitivity site-associated variants on risk of hepatoblastoma	
Institution/Agency	University of Minnesota
Year Approved	2015
Samples Requested	360
Year Released	Pending. No samples released to date.
Study Summary	Hepatoblastoma (HB) is a rare liver tumor that occurs most commonly in children under five years of age. Very little is known about the causes of HB, and genetic factors may play a role. Researchers will first use their existing bank of HB samples to identify genetic variants that increase risk of HB. They will then use Michigan’s newborn blood spots to validate their initial findings.
Neonatal Dried Blood Spot Testing	
Institution/Agency	Translational Genomics Research Institute
Year Approved	2015
Samples Requested	90
Year Released	2016
Study Summary	The study will use blood spots for RNA extraction and analysis. The requested spot will be from 2014, 2010, 2008, 2005, and 1995. This time frame will encompass spots that have been stored at ambient temperature and in a -20° freezer. This study will investigate how storage conditions and age affect the amount and quality of the RNA.
Enabling Fragile X screening using blood spot cards	
Institution/Agency	Asuragen
Year Approved	2015
Samples Requested	10,000
Year Released	2016
Study Summary	This study is using blood spots to assess the accuracy of a rapid, high-throughput, and cost-effective newborn screening test for fragile X syndrome. Fragile X syndrome (FXS) is the most common form of inherited intellectual disability and a known genetic cause of autism. Fragile X Newborn Screening (NBS) provides opportunities for behavioral therapies and other interventions at earlier ages when they may offer a greater benefit, and promises to reduce the “diagnostic odyssey” associated with FXS. In addition, multiple clinical trials are ongoing to assess therapeutics that impact molecular pathways that are disrupted in FXS. Finally, NBS has been favorably received by parents in prospective longitudinal studies. As a result, accurate and cost-effective screening



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	technologies are needed in anticipation of emerging therapeutic options taken together with the existing benefits of early detection.
Genetic Overlap Between Anomalies and Cancer in Kids (GOBACK Study)	
Institution/Agency	Baylor College of Medicine
Year Approved	2015
Samples Requested	300, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	Pending. No samples released to date.
Study Summary	One of the strongest risk factors for childhood cancer is being born with a congenital malformation. The underlying reasons for this association are unknown. This study uses blood spots to attempt to find new genetic mutations (mutations not inherited from the child's mother or father, also known as de novo mutations) that may explain the overlap of these conditions. We anticipate that the results of this study will ultimately lead to the identification of novel cancer predisposition syndromes which could be used in cancer screening strategies for earlier detection of children at high risk for developing cancer. This study will be conducted through collaborative relationships among researchers in Texas, Arkansas, Michigan, North Carolina, Utah, and Washington State.

2014 Approved Research	
Maternal Social Environment and Telomere Length	
Institution/Agency	University of Michigan
Year Approved	2014
Samples Requested	225
Year Released	2015
Study Summary	This study assesses whether it is possible to use a common laboratory method, qPCR, to measure telomere length in blood spots. Telomeres are sections of DNA at the ends of chromosomes. The study also assesses whether telomere length is affected by the maternal social environment during pregnancy.
Molecular Epidemiology of Pediatric Germ Cell Tumors	
Institution/Agency	University of Minnesota
Year Approved	2014
Samples Requested	1,000
Year Released	Pending. No samples released to date.
Study Summary	Pediatric germ cell tumors (GCTs) are thought to result from events in utero. The incidence of GCTs has increased but the underlying causes are unknown. Given the early age of onset, a genetic cause seems likely. These researchers recently completed a large study to evaluate the genetic contribution to GCTs and will use Michigan blood spots to validate their initial findings. This research will be the largest genetic epidemiology study of pediatric GCTs to date, and will evaluate genetic susceptibility.
Genetic and Metabolic Associations with Congenital Hypothyroidism	
Institution/Agency	University of Iowa
Year Approved	2014
Samples Requested	650
Year Released	2014



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Study Summary	Congenital hypothyroidism (CH) is partial or complete loss of thyroid function. If untreated, it results in damage to the brain and abnormal growth, but with treatment results in normal growth and development. Treatment must begin in the 1 st months of life, so CH is part of newborn screening. This study assesses the risk for secondary problems like type 2 diabetes in people with CH. Results could improve follow-up screening for CH, help to better understand neonatal metabolism and later-life chronic conditions like type 2 diabetes.
Healthy Families	
Institution/Agency	University of Michigan
Year Approved	2014
Samples Requested	140, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	2014, <i>partial release</i>
Study Summary	This study is part of a larger one exploring aspects of a child's biology, diet, physical activity, environment and family relationships to find factors that impact observable satiety cues (a child being full). Blood spots are used to study changes over time in epigenetic markers, genetic changes that influence whether and when certain genes are turned on or off. The study may reveal whether certain environments affect the expression of certain genes and contribute to obesity. Findings hope to support development of tailored interventions that can help parents better guide their children through healthy development and reduce childhood obesity.
ARCH Study	
Institution/Agency	Michigan State University
Year Approved	2014
Samples Requested	TBD
Year Released	Pending. No samples released to date.
Study Summary	The purpose of ARCH is to create an archive of health and biological data primarily for use in case control studies. Data is collected during pregnancy and then annually for five years to identify health conditions that develop in early childhood. ARCH is a resource for investigators. Blood spots may be used in future ARCH studies after IRB and Scientific Advisory Board review and approval of each study.
Measuring Orotic Acid in Newborn Screening Specimens as an Indicator for OTC Deficiency	
Institution/Agency	Wisconsin Newborn Screening Program
Year Approved	2014
Samples Requested	6
Year Released	2014
Study Summary	The purpose of this study is to determine if orotic acid can be measured in newborn screening blood spots and whether the amount of orotic acid in the blood spots is greater in patients with ornithine transcarbamylase (OTC) deficiency or carriers of the disease than the normal population. OTC deficiency is an inherited disorder that causes ammonia to build up in the blood.
Neonatal Environmental Exposures and Epigenetics and Childhood Brain Tumor Risk	
Institution/Agency	University of Michigan
Year Approved	2014
Samples Requested	200
Year Released	Pending. No samples released to date.



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Study Summary	This study will use blood spots to assess the association of prenatal heavy metal (cadmium, lead, mercury) exposure and prenatal gene-specific DNA methylation (environmentally sensitive modification of DNA often altered in cancer) with childhood glioma risk. Known risk factors explain only 5-10% of childhood glioma, the most common malignant brain tumor in children. Finding other risk factors may help better understand its cause and improve detection, treatment, and prevention. The prenatal environment may play a role in childhood glioma development but prenatal risk factors have not been extensively studied. This project can advance childhood cancer research by establishing new methods for metal exposure assessment and measuring DNA methylation in neonatal bloodspots.
Development of an Improved Biotinidase Activity Assay	
Institution/Agency	Future Diagnostics Solutions
Year Approved	2014
Samples Requested	100
Year Released	2014
Study Summary	Biotinidase deficiency is an inherited disorder in which the body cannot recycle or reuse the vitamin biotin. Children found through newborn screening and treated can maintain normal health and development. This study will use blood spots to develop an improved assay to detect biotinidase deficiency through newborn screening.
Frequency of 11p15.5 Gene Transcription Abnormalities in Newborns with Isolated Omphalocele	
Institution/Agency	University Hospitals Case Medical Center
Year Approved	2014
Samples Requested	45
Year Released	Pending. No samples released to date.
Study Summary	An omphalocele is a defect in the wall of the abdomen where the bowel and other organs are outside of the body. It is usually thought to be a sporadic birth defect, but an overgrowth condition known as Beckwith-Wiedemann syndrome (BWS) is present in 20% of fetuses diagnosed with an apparently isolated omphalocele. Typical features of BWS include large size, asymmetry of the body, omphalocele, and a large tongue. This study will assess blood spots from newborns with isolated omphalocele to determine the frequency of BWS-related genetic changes in these infants.
Molecular Genetics of Acute Lymphoblastic Leukemia in Patients with Down Syndrome	
Institution/Agency	Baylor College of Medicine
Year Approved	2014
Samples Requested	300
Year Released	Pending. No samples released to date.
Study Summary	Children with Down syndrome (DS) have a 10-20 fold increased risk of leukemia. While there is a clear genetic basis for the increased acute lymphoblastic leukemia (ALL) risk in DS, the exact gene(s) involved remain largely unknown. Recent studies have identified a number of genes that influence ALL susceptibility in children. There are no published studies to date on susceptibility genes specific to children with DS. This study will assess whether there are unique genes that predispose to ALL in combination with a genetic background of DS, which differ from those that predispose to ALL in the non-DS population. This could shed light on leukemia development in children with DS.



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2013 Approved Research	
ARCH Sub-Study: Effects of Maternal Physical Activity on Methylation Patterns in Offspring Blood Spots	
Institution/Agency	Michigan State University
Year Approved	2013
Samples Requested	42, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	2014
Study Summary	More and more people are obese and suffer from chronic disease. Studies have shown that events during pregnancy and the state of the pregnancy may play a role. These factors may affect the way a newborn's cells work later in life. This study looks at whether a pregnant woman's physical activity has any effect on offspring's cells. The study also looks at the effect of maternal body mass index.
Bloodspot Environmental Epidemiology Project (BLEEP)	
Institution/Agency	Michigan State University
Year Approved	2013
Samples Requested	35, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	2014
Study Summary	This study assesses twins and their siblings' behavior to see if there is a link between prenatal factors and mental health outcomes. The study uses blood spots to assess genetic and uterine factors that may have had an effect on the child's mental health. Neighborhood poverty levels are also assessed.
Clinical Database of Children with Krabbe Disease: A World-Wide Registry	
Institution/Agency	University at Buffalo/ Hunter James Kelly Research Institute
Year Approved	2013
Samples Requested	<20, <i>Specific parental consent and authorization was provided for use in this study.</i>
Year Released	2014
Study Summary	Hunter's Hope Foundation helps support research and families of children with Krabbe which is an often fatal inherited nervous system disease. Hunter's Hope, with the University at Buffalo, created the Hunter James Kelly Research Institute to find better treatments and a cure for Krabbe and related diseases. This study develops a database of children with Krabbe. This will help doctors better understand signs and tests that can predict the type of Krabbe. Enrolled parents can ask for their child's blood spot, stored for their personal use, to do genetic testing for Krabbe.
Ecologic Stressors, PTSD and Drug Abuse In Detroit	
Institution/Agency	University of Michigan
Year Approved	2013
Samples Requested	200, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	Pending. No samples released to date.



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Study Summary	This project is part of a bigger study known as the Detroit Neighborhood Study (DNHS). DNHS is ongoing and began in 2007. Several DNHS projects have been done. The most recent asks subjects to grant consent for using part of their child's blood spots. The blood spots will be tested for markers of maternal immune response during pregnancy. Subjects also complete surveys about upsetting events during pregnancy and mental health outcomes. This project may help shed light on when steps can be taken to lower the chance of a child developing the same mental health challenges as their parent(s).
Evaluation of the Effects of Prenatal Exposure to Non-Essential Heavy Metals on Hearing	
Institution/Agency	University of Michigan
Year Approved	2013
Samples Requested	700
Year Released	200 Released in 2013 and 500 pending release.
Study Summary	This study assesses the level of heavy metals such as lead in blood spots. Hearing screening results are matched to the coded blood spots and assessed to see whether heavy metals such as lead may impact hearing.
Gene-Environment Interplay and Young Children's Executive Functioning	
Institution/Agency	Wayne State University
Year Approved	2013
Samples Requested	30, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	Pending. No samples released to date.
Study Summary	This study will use blood spots from twins to assess whether certain genes are active versus inactive. Parents are asked how twins perform tasks involving working memory and attention and differences are studied. Researchers are trying to see if there is a genetic role or other factors explaining any of the differences seen.
Identification of Genetic Causes of Tetralogy of Fallot Using Massively Parallel Sequencing	
Institution/Agency	University of Michigan
Year Approved	2013
Samples Requested	390
Year Released	2014
Study Summary	The high morbidity and mortality from severe congenital heart defects is prompting a search for their cause. This study uses blood spots from children with a severe heart defect (tetralogy of Fallot) to assess genes known or thought to be involved with heart development. These genes are not known to be implicated in cancer or other life-threatening conditions.
Improving IRT/DNA Newborn Screening for Cystic Fibrosis to Reduce False Positive Results by a New Molecular Strategy	
Institution/Agency	Wisconsin Newborn Screening Program
Year Approved	2013
Samples Requested	300
Year Released	2013 and 2014
Study Summary	A group of states is working to assess a new process for cystic fibrosis (CF) newborn screening. CF is an inherited chronic disease that affects the lungs and digestive system. Over 1800 changes in the CF gene can cause this disorder. Many states use a panel of about 40 of the most common CF gene changes to find babies with this disorder. This study will assess whether a panel of 157 CF gene changes improves the overall process.



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Lab-On-A-Chip for Multiplexed Newborn Screening of Metabolic Disorders-Assay Development	
Institution/Agency	Advanced Liquid Logic
Year Approved	2013
Samples Requested	12
Year Released	2013
Study Summary	Blood spots were used to assess a new method of newborn screening for metabolic disorders. Metabolic disorders affect the way the body gets or uses energy from the food we eat. Metabolic disorders on newborn screening panels must be found shortly after birth. This allows treatment to prevent damage to the body. This study is complete. No results are available to date.
Neural and Genetic Factors Contributing to Variants of Pediatric Anxiety Disorder	
Institution/Agency	Wayne State University
Year Approved	2013
Samples Requested	179, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	Pending. No samples released to date.
Study Summary	Changes that affect how a cell's gene activation and inactivation will be studied as well as the actual sequence of DNA in certain genes. Results will help link genes to behavior and develop better interventions for children at risk for adverse emotional development. Study closed until funding becomes available.
Newborns Conceived Through IVF Technology and the Incidence of Genomic Anomalies: A Pilot Study in Epigenetics	
Institution/Agency	Wayne State University
Year Approved	2013
Samples Requested	150
Year Released	2014
Study Summary	Genetic material in blood spots from children born to mothers aided by assisted reproductive technology is being assessed. Actual changes in the sequence of the DNA are not studied. Instead changes that affect the activation or inactivation of genes are studied to find out whether these changes affect children as they develop. These details could then be given to parents who are considering assisted reproductive technology.
Neurotoxin Exposure and Brain Development	
Institution/Agency	University of Michigan
Year Approved	2013
Samples Requested	300
Year Released	Pending. No samples released to date.
Study Summary	Early contact with toxins (lead and mercury) during development is associated with intellectual and memory impairment, developmental delays in language and attention deficit disorder. This study will assess the effects these neurotoxins have on neural function by assessing their levels at different stages in development in people with typical development and those with Autism Spectrum Disorders. It will also explore the possible role of genetic processes and neurotoxin exposures to the impairments associated with such exposure and to the etiology of Autism Spectrum Disorders. Study closed until funding becomes available.



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2012 Approved Research	
Astoria-Pacific, Inc.- Total Galactose Screening Method Comparison	
Institution/Agency	Astoria-Pacific, Inc.
Year Approved	2012
Samples Requested	11
Year Released	2012
Study Summary	This study aimed to show the Food and Drug Administration (FDA) that a new test could detect newborns with galactosemia as well as the current kit on the market. This would allow more newborn screening solutions that are safe and effective. Galactosemia is an inherited condition in which babies are not able to break down a sugar found in breast milk and most formulas. A special diet begun soon after birth will prevent damage to the body. <i>This study is done. The FDA approved Astoria-Pacific's kit. It is currently being used in one newborn screening lab and expected in others in the near future.</i>
Twins and Siblings Study	
Institution/Agency	Michigan State University
Year Approved	2012
Samples Requested	200, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	Pending. No samples released to date.
Study Summary	This study will use blood spots from twins and their siblings to assess the level of androgen (a hormone) and whether androgen-related genes are activated. This work may show how prenatal and genetic factors impact acting out behaviors in children.

2011 Approved Research	
Dried Blood Spots to Determine the Effect of Pb on DNA Methylation in Children	
Institution/Agency	Wayne State University
Year Approved	2011
Samples Requested	51, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	2013
Study Summary	Blood spots were tested for lead levels. The effect on gene expression (active versus inactive genes) was also compared between blood spots and current blood samples from the children. Results may provide data to help children exposed to lead. <i>This study is done. Results "suggest that lead exposure during pregnancy affects the DNA methylation status of the fetal germ cells, which leads to altered DNA methylation in grandchildren's neonatal dried blood spots. This is the first demonstration that an environmental exposure in pregnant mothers can have an epigenetic effect on the DNA methylation pattern in the grandchildren."</i> <i>D. Ruden, et al. Multigenerational epigenetic inheritance in humans: DNA methylation changes associated with maternal exposure to lead can be transmitted to the grandchildren. Scientific Reports; 5. September 2015</i> http://www.nature.com/articles/srep14466
Newborn DNA Methylation and Biochemical Status in Autism, ADHD and Cerebral Palsy	
Institution/Agency	Wayne State University
Year Approved	2011



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Samples Requested	119, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	2012
Study Summary	DNA methylation is a biochemical process that affects the genetic activity within a cell. Factors such as diet, stress, drugs, toxins and aging may have an effect on which pieces of DNA in a cell are active. This study compares the degree of methylation in specific genes between persons with and without attention hyperactivity disorder (ADHD), autism and cerebral palsy. Biochemical testing combined with methylation studies soon after birth could help predict risk.
Prenatal Alcohol Exposure: The Influence on Epigenetic Processes	
Institution/Agency	Wayne State University
Year Approved	2011
Samples Requested	18, <i>Additional study specific informed consent was obtained for this research.</i>
Year Released	2011
Study Summary	Fetal Alcohol Spectrum Disorders are studied in this project. Epigenetic factors, resulting from inherited changes in gene expression (active versus inactive genes), are being assessed in the blood spots. Different epigenetic factors may help diagnose infants. They may also help explain why certain signs of fetal alcohol spectrum disorders develop in some children but not others. These epigenetic factors may also shed light on the risks from alcohol use just prior to and during pregnancy.
Technology Enhancement and Implementation of Michigan Newborn Screening for Severe Combined Immunodeficiency (SCID) and Related Disorders	
Institution/Agency	Michigan Department of Community Health
Year Approved	2011
Samples Requested	2,500
Year Released	2011 and 2012
Study Summary	Severe Combined Immune Deficiency (SCID) is the most severe type of primary immunodeficiency. It is rare and can be lethal. Early treatment improves survival. The Michigan NBS laboratory used blood spots to validate its screen for SCID and related disorders. This study is done. Resulted in addition of SCID to Michigan's newborn screening panel in 2011. After two years, over 230,000 MI newborns were screened for SCID and 34 newborns with immune deficiencies were detected. The study also resulted in improved methods for SCID screening which have been shared at a number of national events to help other newborn screening programs begin SCID screening.

2010 Approved Research	
Assessment of the SMN1 and 2 Genes in Spinal Muscular Atrophy Affected Patients and a Carrier Frequency Study	
Institution/Agency	ARUP Laboratories
Year Approved	2010
Samples Requested	3,000
Year Released	2011 and 2012
Study Summary	Spinal muscular atrophy (SMA) is a group of inherited disorders that cause progressive weakness and wasting of muscles. Muscles of the limbs and trunk are affected. Feeding, swallowing and breathing can become impaired. This study used blood spots to develop a newborn SMA screening test. The study is done. The screening test was able to identify all cases of SMA and did not incorrectly identify any normal samples as SMA cases. The



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	<p>researchers concluded the test had features that would make it suitable for newborn screening. <i>S. Dobrowolski, et al. Newborn Screening for Spinal Muscular Atrophy by Calibrated Short-Amplicon Melt Profiling. Clinical Chemistry 2012; 58:1033-1039</i></p>
DNA Methylation in Sudden Unexplained Infant Death Syndrome	
Institution/Agency	Wayne State University
Year Approved	2010
Samples Requested	24
Year Released	Pending. No samples released to date.
Study Summary	<p>Sudden Unexplained Infant Death Syndrome (SUIDS) is the sudden unexplained death of an infant or young child. SUIDS is a complex disorder with genetic, environmental, biochemical and social causes. There is strong evidence of a role played by prenatal factors such as maternal smoking and infection. A number of genes have also been linked to SUIDS. The aim of this study is to assess whether a difference exists in gene activation in blood spots from newborns who expired as a result of SUIDS. This could improve understanding of the causes of SUID including prenatal factors and potential risk factors.</p>
Methods Comparison of Luminex Multiplex Newborn Screening Assay to Delfia	
Institution/Agency	Luminex Corporation
Year Approved	2010 and 2012
Samples Requested	2,210
Year Released	2011 and 2013
Study Summary	<p>Hormone levels were assessed to determine accuracy of technology designed by Luminex Corporation to screen for congenital adrenal hyperplasia, congenital hypothyroidism and cystic fibrosis. This study is done. Luminex discontinued their newborn screening program in 2013 after company restructuring. No results were provided from this study.</p>
High Throughput Methods to Measure Disparities in Childhood Exposure to Tobacco	
Institution/Agency	University of Minnesota
Year Approved	2010
Samples Requested	350
Year Released	2010
Study Summary	<p>Children are exposed to tobacco in utero by maternal smoking and during childhood from second hand smoke (SHS). SHS is associated with health problems such as low birth weight, asthma, ear and lower respiratory infections and sudden infant death syndrome. SHS exposure and its health effects vary by race, ethnicity and socio-economic status. Efforts to stop childhood exposure to SHS are critical for reducing health disparities. Blood spots enable thousands of samples to be assessed for exposure levels across a population. This project will use blood spots from several states to study differences in childhood exposure to SHS. Findings will provide estimates of the US population prevalence of in utero tobacco toxin exposure by race. This study is done. Data from the study confirmed that parental reporting of smoking during pregnancy is an imperfect way to measure prenatal exposure to tobacco smoke. Detailed results are in <i>Pediatrics</i> at http://pediatrics.aappublications.org/content/133/6/e1632.full.html</p>
HLA-Typing of Neonatal Blood Spots	
Institution/Agency	Genomics USA
Year Approved	2010
Samples Requested	40
Year Released	2010



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Study Summary	A larger study is being done to develop a new technology to perform very-low-cost genetic testing. The testing targets the HLA locus, the set of genes responsible for person-to-person variation in the immune system, the basis for a tissue-match in organ transplants and possibly for personal variation in response to certain vaccines or infection. This study will not discover disease correlations with HLA-type. Instead the study will try to determine if a new approach to HLA-typing can be done using blood spots collected on a Guthrie card, the card used for newborn screening. Michigan’s blood spots were used for a pilot study to show that HLA-typing data can be obtained from blood spots.
Metabolic Newborn Screening for Congenital Heart Defects	
Institution/Agency	Wayne State University
Year Approved	2008 and 2010
Samples Requested	24
Year Released	2010
Study Summary	Prenatal risk factors such as maternal alcohol use, maternal fever, inflammation and diet are thought to play important roles in congenital heart defects (CHD). Recent studies report a link between certain classes of CHD in offspring and a deficiency in the vitamin, folic acid, in the mother. Folic acid deficiency could change essential gene functions and suppress important cardiac development leading to CHD. The aim of this study is to see if there is a relationship between changes in essential gene functions in blood spots of children with CHD.

The studies listed in this report began after the start of the Michigan BioTrust for Health. For a list of studies that began after the public health code was amended in 2000 to allow use of blood spots in health research but prior to the start of the BioTrust, please visit www.michigan.gov/biotrust and view the Blood Spot Research page.