



University of Minnesota: Use of Fetal Tissue in Research

SPECIAL REVIEW
December 20, 2018

OFFICE OF THE LEGISLATIVE AUDITOR
STATE OF MINNESOTA

State of Minnesota
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OFFICE OF THE LEGISLATIVE AUDITOR

STATE OF MINNESOTA • James Nobles, Legislative Auditor

December 20, 2018

Members of the Legislative Audit Commission:

This report fulfills a request enacted into law in 2017. The Legislature asked the Office of the Legislative Auditor (OLA) to review the use of fetal tissue in research at the University of Minnesota. The legislative request followed inaccurate statements by University officials about the use of fetal tissue in research at the University.

We found that criticism and new legal requirements forced the University of Minnesota to tighten controls over how researchers acquire, use, and dispose of fetal tissue. We also found that very little fetal tissue research is currently being conducted at the University.

The University cooperated fully with our review.

Sincerely,

James Nobles
Legislative Auditor

Elizabeth Stawicki
Legal Counsel



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INTRODUCTION

The Office of the Legislative Auditor (OLA) conducted this special review in response to a legislative request. As part of a law enacted in 2017, the Legislature asked OLA to review the use of fetal tissue in research at the University of Minnesota.¹

To conduct the review, we examined laws, regulations, University policies, and a large number of policy, scientific, and legal articles related to fetal tissue research. In addition, we interviewed University officials and scientists involved with fetal tissue policy and research. We also reviewed and relied on recent reports the University has submitted to the Legislature about fetal tissue research projects, particularly a report completed by an outside consultant. Those reports—and our report—cover the time period from 2010 to 2018.

CHALLENGES

We faced the following challenges conducting this review:

- **Scientific Complexity.** The research that uses fetal tissue is complex, “cutting edge” science. As nonscientists, it was futile for us to even try to comprehend the technical aspects of the research, but we needed to achieve at least a rudimentary understanding of certain terms and concepts. We did this by reading scientific articles about fetal tissue research and checking our understanding with University officials and scientists.
- **Scope.** We had to consider whether to include stem cell research within the scope of our review given the definition of “fetal tissue” in Minnesota law.² We decided not to include stem cell research in the scope of our review for the reasons stated in the footnote below.³ Rather, we provide some basic information about stem cells and the University’s involvement in stem cell research in Appendix A.

¹ *Laws of Minnesota* 2017, chapter 89, art. 2, sec. 27.

² Minnesota law says: “Fetal tissue means any body part, organ, or cell of an unborn human child [except] tissue or cells obtained from a placenta, umbilical cord, or amniotic fluid.” See *Minnesota Statutes* 2018, 137.47, subd. 1(c). By this definition, we could have included stem cell research in our review since scientists working on stem cell research often obtain stem cells from an electively aborted embryo (i.e., “an unborn human child”). We discuss why we did not include stem cell research in our review in the following footnote.

³ We excluded stem cell research for the following reasons: First, the legislative request for an OLA review of fetal tissue research at the University of Minnesota did not reference stem cell research. Second, in its reports to the Legislature on fetal tissue research, the University has not included information on the University’s stem cell research, and we are not aware of any legislative objection to stem cell research not being included in those reports. Third, scientists no longer have to rely exclusively on cells from embryos or fetuses for stem cell research and medical treatments. They can use adult stem cells, as well as cells from “stem cell lines” that have been grown over decades outside a human body.

- **Private Lawsuit Against the University.** We had to ensure that we were not drawn into a lawsuit brought by Pro-Life Action Ministries in late 2016 against the University's use of fetal tissue in research. As an independent audit office in the Legislative Branch, we take every precaution possible not to have our work become part of lawsuits brought by private parties. We must avoid even the perception that OLA is aligned with one side or the other in such litigation. Because of its relevance to the subject covered in our review, we provide a brief discussion of the case in Appendix B.

REPORT PREVIEW

This report presents the following information:

- A review of the 2015 controversy that raised questions about the use of fetal tissue in research at the University and how the University responded.
- A review of projects at the University that have used—and are using—fetal tissue; how much the University paid to acquire the tissue; and how the research projects have been—and are—funded.
- A review of the laws, regulations, and University policies that govern the acquisition, handling, and disposal of fetal tissue.
- Our preliminary assessment of two changes the University made to address concerns about its control over the acquisition, tracking, and disposal of fetal tissue. Those changes involve the roles and responsibilities of the University's Fetal Tissue Research Committee and the Anatomy Bequest Program.
- Our concluding comments about fetal tissue research at the University.

Finally, in Appendix A, we present a brief discussion of stem cells and stem cell research at the University of Minnesota. In Appendix B, we review a lawsuit brought against the University's fetal tissue research activities. In Appendix C, we include the form researchers must submit to the Fetal Tissue Research Committee when a research project proposes to use fetal tissue.

CONCLUSION

Controversy, criticism, and new legal requirements forced the University of Minnesota to tighten controls over how researchers acquire, use, and dispose of fetal tissue. While the changes are intended to—and likely will—create greater transparency and accountability, we cannot give a firm conclusion on their impact. The changes are too recent, and very few research projects have been subject to the new requirements.

THE FETAL TISSUE CONTROVERSY

Although not prohibited by Minnesota or federal laws, the use of fetal tissue in research is controversial because researchers primarily acquire the tissue from elective abortions.⁴ As one expert said, “Fetal research has been the dominant conflict in research ethics since the early 1970s.... The most controversial... aspects of the debate involves research affecting the fetus in elective abortion.”⁵

PLANNED PARENTHOOD VIDEOS

In 2015, legislators and others raised questions about fetal tissue research at the University following the release of undercover videos involving Planned Parenthood of California. The Center for Medical Progress (CMP), a group that opposes legalized abortion, made the videos of Planned Parenthood staff discussing how the organization preserves fetal organs during abortions and the costs to researchers to obtain various fetal organs.⁶ Opponents of elective abortions accused Planned Parenthood of selling fetal body parts for profit.⁷ Planned Parenthood responded that some of its clinics donate fetal tissue to researchers but only with a woman’s consent, and any charges were solely to cover processing and shipping; not to make a profit.⁸

⁴ The fetal tissue controversy has produced a large number of articles. Generally, the articles either support fetal tissue research based on the benefits it has brought and potentially will bring in the future, or they challenge the ethics and morality of the research, while pointing to other methods of conducting medical research. These are a few of the articles we reviewed:

- R. Alta Charo, J.D., “Perspective Fetal Tissue Fallout,” *New England Journal of Medicine* 373, No. 10 (September 3, 2015): 890-891, <https://www.nejm.org/doi/pdf/10.1056/NEJMp1510279>, accessed October 8, 2018.
- Paige Comstock Cunningham, “Bioethics and Fetal Tissue,” written testimony submitted to the U.S. House of Representatives, March 3, 2016, <https://cbhd.org/testimony-bioethics-and-fetal-tissue>, accessed October 8, 2018.
- James F. Childress, “Ethics, Public Policy, and Human Fetal Tissue Transplantation Research,” *Kennedy Institute of Ethics Journal*, Johns Hopkins University Press, 1, No. 2 (June 1991): 93-121.
- James F. Childress, “Deliberations of the Human Fetal Tissue Transplantation Research Panel,” *Biomedical Politics* (U.S. Institute of Medicine, Washington, DC: The National Academies Press, 1991): 215-248, <https://www.nap.edu/read/1793/chapter/7>, accessed October 8, 2018.

⁵ John C. Fletcher, “Ethics and Fetal Research: Past, Present, and Future,” *Fetal Research and Applications: A Conference Summary* (U.S. Institute of Medicine, Washington, DC: The National Academies Press, 1994), <https://www.ncbi.nlm.nih.gov/books/NBK232010/>, accessed October 8, 2018.

⁶ Sandhya Somashekhar and Danielle Paquette, “Undercover video shows Planned Parenthood official discussing fetal organs used for research,” *The Washington Post*, July 14, 2015.

⁷ *Planned Parenthood Exposed: Examining the Horrific Abortion Practices at the Nation’s Largest Abortion Provider: Hearing Before the House Committee on the Judiciary*, 114th Congress 114-41 (2015) (statement of James Bopp, Jr., General Counsel, National Right to Life Committee).

⁸ Planned Parenthood, *Statement from Eric Ferrero, Vice President of Communications, Planned Parenthood Federation of America*, July 14, 2015. The statement said in part: “At several of our health centers, we help patients who want to donate tissue for scientific research, and we do this just like every other high-quality health care provider does - with full, appropriate consent from patients and under the highest ethical and legal standards. There is no financial benefit for tissue donation for either the patient or for Planned Parenthood. In some instances, actual costs, such as the cost to transport tissue to leading research centers, are reimbursed, which is standard across the medical field.” See <https://www.plannedparenthood.org/about-us/newsroom/press-releases/statement-from-planned-parenthood-on-new-undercover-video>, accessed October 8, 2018.

In a letter dated July 20, 2015, a significant number of Minnesota legislators called on Governor Mark Dayton to investigate Planned Parenthood's operations in Minnesota and called on the University of Minnesota to "collaborate with state officials to make sure they are not buying or receiving organs harvested from abortions."⁹ The Governor rejected the request for an investigation and a University spokesperson told legislators and journalists that University scientists were not currently using human fetal tissue in research.¹⁰

When journalists uncovered invoices showing that, in fact, University scientists had recently purchased fetal tissue, University of Minnesota President Eric Kaler directed University Vice President for Research Dr. Brian Herman to review the University's use of human fetal tissue and determine where researchers had obtained the tissue.¹¹

THE UNIVERSITY'S INITIAL RESPONSE

In a memorandum dated October 14, 2015, Herman acknowledged that researchers at the University were using human fetal tissue for research.¹² He said the researchers had obtained tissue from Advanced BioScience Resources (ABR) and Stem Express (both based in California). He said these suppliers had obtained consent from the donors and operated according to federal guidelines that prohibit them from profiting from the tissue.¹³ Herman added:

Research using fetal tissue, which has long been an accepted part of the research world and which helped create breakthroughs such as the polio vaccine, holds great promise for new therapies to cure cancer, heart disease, bacterial and viral diseases, and asthma, to name just a few examples. Information derived from research using fetal tissue allows researchers to examine scientific questions that adult tissues, tissue from miscarriages or existing laboratory stem cell lines cannot address.¹⁴

Herman acknowledged that current University policies did not comprehensively address the disposal of fetal tissue used in research. To ensure the University treated the tissue with the "utmost respect and dignity," Herman said that the University's

⁹ Minnesota Senate Republican Caucus, letter to Governor Mark Dayton, July 20, 2015.

¹⁰ Tim Pugmire, "Dayton rejects Planned Parenthood investigation," *MPR News*, July 28, 2015, <https://www.mprnews.org/story/2015/07/21/planned-parenthood-investigation-minnesota>, accessed October 8, 2018; Erica Mahoney, "U faces questions on source of fetal tissue," *Minnesota Daily*, November 4, 2015; and Jeremy Olson, "After an awkward flip-flop, University of Minnesota defends fetal tissue research," *Star Tribune*, January 30, 2016.

¹¹ See footnote 10.

¹² Brian Herman, Vice President for Research, University of Minnesota, memorandum to Regent Dean Johnson, Chair, Board of Regents; and Regent Laura Brod, Chair, Audit Committee; *Fetal Tissue Research*, October 14, 2015.

¹³ See footnote 12.

¹⁴ See footnote 12.

Anatomy Bequest Program would immediately begin handling the procurement and disposal of fetal tissue.¹⁵

The Board of Regents Chair and Vice Chair followed up by asking President Kaler whether ABR's tissue came from elective (induced) abortions.¹⁶ If so, they said, the Board would potentially consider prohibiting the University from purchasing human fetal tissue resulting from elective abortions.¹⁷

Kaler responded to the Regents that the University did not know all of the sources ABR used to procure fetal tissue but that ABR had obtained tissue from elective abortions at clinics throughout the U.S., including from Minnesota, until July of 2015.¹⁸ Kaler added that prohibiting suppliers that procure tissue from induced abortions would be tantamount to prohibiting all fetal tissue research at the University.¹⁹ Kaler added:

I believe the University of Minnesota should stand with its peers, other major research universities and academic medical centers throughout the country, who have recently endorsed a statement issued by the American Association of Medical Colleges, endorsing the continued legal and responsible use of fetal tissue in medical research.²⁰

To date, the Regents have not taken any action to prohibit University scientists from using fetal tissue obtained from elective abortions.

THE UNIVERSITY'S ADDITIONAL ACTIONS

After acknowledging that scientists at the University were using fetal tissue in research, University officials took the following four major steps to proactively identify fetal tissue research activities and tighten controls over this area of research:

- **Anatomy Bequest Program.** As noted, in 2015, the University put its Anatomy Bequest Program in charge of procuring, tracking, and disposing of fetal tissue for research. The program is the conduit for receiving donations of whole bodies of deceased individuals for anatomy education and research within the University's Academic Health Center, including the Medical School. We will offer some observations on the Anatomy Bequest Program in the assessment section of this report.

¹⁵ See footnote 12.

¹⁶ Dean Johnson, Chair, and David McMillan, Vice Chair, Board of Regents, University of Minnesota, letter to Eric Kaler, President, University of Minnesota, October 20, 2015.

¹⁷ See footnote 16.

¹⁸ Eric Kaler, President, University of Minnesota, letter to Dean Johnson, Chair, and David McMillan, Vice Chair, Board of Regents, University of Minnesota, October 22, 2015.

¹⁹ See footnote 18.

²⁰ See footnote 18.

- **Huron Report.** In early 2016, the University commissioned an outside firm, the Huron Consulting Group, LLC, to identify the University's fetal tissue research going back to January 1, 2010. Huron identified the number of faculty who conducted fetal tissue research at the University, documented sources and storage of fetal tissue, and provided recommendations on tracking the research.²¹ We briefly discuss the Huron report later.
- **Fetal Tissue Research Committee.** In spring 2016, the University created the Fetal Tissue Research Committee (FTR) to review and approve (or not approve) proposals to acquire and use human fetal tissue in non-transplantation research. According to University policy, FTR is to ensure that fetal tissue research adheres to legal requirements, has scientific merit, and is ethically justified. The committee must also advise the University's Institutional Review Board (IRB) when the IRB considers studies that propose to transplant fetal tissue into humans.²² FTR met for the first time in May of 2016, and reviewed and approved several research projects. We will offer some observations on FTR's role in the assessment section of this report.
- **Revised University Policies.** In January 2018, the University issued a revised policy on use of fetal tissue in human transplantation and a policy on the use of fetal tissue in non-transplantation research and teaching. We discuss those policies in a later section.

THE USE OF FETAL TISSUE AT THE UNIVERSITY OF MINNESOTA

Between 2010 and 2018, only a small number of research projects at the University involved the use of fetal tissue. During our review, that number declined even further.

On January 21, 2016, University Vice President Herman sent legislators a letter that said: "Fetal tissue currently is used by approximately 10 researchers at the University of Minnesota who obtain the tissues primarily from Advanced Bioscience Resources Inc."²³ Herman noted that the projects included research on aspects of pediatric cancer, HIV/AIDS, diabetes, Parkinson's and other neural disorders, and spinal cord injuries.

²¹ Huron Consulting Group, *Fetal Tissue Research Assessment* (Chicago, IL, March 17, 2016), 2.

²² Institutional Review Boards (IRBs) are the groups within research institutions established to protect the rights and welfare of human research subjects. They have authority to approve, disapprove, or modify proposals to conduct biomedical and behavioral health research that involve human subjects. See <https://grants.nih.gov/grants/glossary.htm#InstitutionalReviewBoardIRB>, accessed October 8, 2018.

²³ Brian Herman, Vice President for Research, University of Minnesota, letter to Minnesota Legislators, January 21, 2016. Herman added that between 2005 and 2013, two infectious disease researchers had also obtained fetal tissue to research HIV/AIDS, but their research ended in December 2013.

On March 17, 2016, the University released the Huron report, which said “eight (8) current faculty members are using, or have used since January 1, 2010, fetal tissue for research.” The Huron report noted that two other faculty members who had used fetal tissue were no longer at the University.²⁴

On January 15, 2018, in a report to the Legislature, the University identified four research projects that proposed to use fetal tissue, but only two were active. One involved research on the Zika virus and the other involved research on depression and schizophrenia.²⁵ We interviewed the principal researchers for each project.²⁶ The following is a brief summary of their research goals:

- **Zika Virus.** A University of Minnesota researcher was trying to determine whether the Zika virus directly infects cells in the developing human fetal brain, eyes, and inner ear; and if so, how. There is growing evidence to suggest that the Zika virus causes birth defects that severely damage developing human fetal brains, eyesight, and hearing.²⁷ The hope is that once researchers understand how the Zika virus infects these cells, they can begin to develop drugs that could prevent the virus from causing brain, eye, and hearing damage in fetuses. The researchers recently discontinued this research after exhausting the allotted funding. According to the University, the researchers have not ruled out continuing the research if additional funding becomes available.
- **Depression and Schizophrenia.** A University of Minnesota researcher is testing, in part, the validity of using mice to study the causes and therapies for psychiatric disorders in humans such as schizophrenia and depression. In mouse brains, many of the genes are expressed while the brains are developing, suggesting that abnormal development of certain parts of the brain cause many of the psychiatric disorders. Little is known, however, about when these disease-associated genes are expressed in developing human brains. Without knowing this, it is difficult to determine how useful mouse models are for studying the causes and therapies of human psychiatric disorders. The purpose of the study is to determine the patterns of expression of two important genes implicated in schizophrenia and depression in the developing human brain. The researcher told us the project is still in an early stage but slides that contain human fetal tissue will be examined in a later stage of the research.

²⁴ See footnote 21.

²⁵ University of Minnesota, “Human Fetal Tissue Research,” Report to the Minnesota Legislature, 2018.

²⁶ We do not identify the researchers based on *Minnesota Statutes* 2018, 137.47, subd. 3(b), which directed the University not to disclose any information in reports to the Legislature that would identify researchers using fetal tissue or the location of the laboratory or office.

²⁷ The Centers for Disease Control and Prevention advises that pregnant women should not travel to numerous countries outside the United States because of the Zika risk. See <https://wwwnc.cdc.gov/travel/page/zika-travel-information>, accessed October 8, 2018.

TEACHING COLLECTION OF EMBRYOS AND FETUSES

Outside of the timeframe covered in the University's reports (and our review), we learned that between 1910 and 1996, the University received the remains of thousands of miscarried embryos and fetuses, as well as many newborns (four weeks old or less) who died as the result of being born prematurely or having birth defects. The head of the Anatomy Bequest Program told us that until 1996, the University had a crematory in the basement of Jackson Hall and provided free disposition and cremation services for these embryos and fetuses. Presumably, various medical facilities in Minnesota used this service, but documentation showing exactly which facilities is not available.

The Anatomy Bequest Program director said that in most cases these embryos and fetuses were not used for teaching or research. However, 125 embryos and fetuses were retained for teaching purposes in what University officials have referred to as a "historical teaching collection of fetuses."²⁸ The director told us that in 2014, a University researcher made high resolution scans of some of the fetuses in order to create 3D models for teaching anatomy at the medical school. The researcher completed the scanning portion of the project in 2017, and the University now uses these models as an embryology teaching resource. Later in this report, we will discuss how the University disposed of these embryos and fetuses.

PAYMENTS AND FUNDING

Legislators asked OLA to determine how much the University has paid to obtain fetal tissue. In response, we requested all invoices involving payments for fetal tissue from 2010 through January 2018. The University provided us with 36 invoices, some involving multiple orders of various types of tissue.²⁹ Payment amounts varied depending on the type of tissue involved.

- From 2010 through 2015, the University paid Advanced Bioscience Resources \$17,310 for various kinds of tissue.
- In June 2014, the University paid Stem Express \$3,235 for tissue.
- From 2016 through 2017, the University paid the University of Washington's Department of Pediatrics \$6,100 for tissue.

Although our knowledge of fetal tissue pricing is limited, we did not see payments in the invoices we reviewed that seemed to violate the federal legal requirement, which we will note in the following section, that payments not include a profit for the source providing the tissue.

²⁸ Other academic institutions also collected embryos and fetuses for teaching medical students about human development. See <http://www.medicalmuseum.mil/index.cfm?p=collections.hdac.collections.index>, accessed October 8, 2018.

²⁹ We accepted the documents the University submitted as accurate and complete. We did not attempt to independently query the University's invoice or payment systems.

According to the information we obtained from the University, researchers funded fetal tissue and other research costs from a variety of sources, including federal grants, private foundation grants, and donations made to the University Foundation. We did not independently audit the University's accounting records relative to fetal tissue payments or funding.

LAWS, REGULATIONS, AND POLICIES

The University of Minnesota is subject to myriad complex federal and state laws and regulations that govern how researchers obtain, handle, and dispose of human fetal tissue. We provide a summary of the major laws—both federal and state—including Minnesota's 2017 statute, which tightened controls on the University of Minnesota's research that uses human fetal tissue. We also summarize the University's policies that cover human fetal tissue research.

FEDERAL LAW

Profit Prohibited

Federal law prohibits anyone from making a profit by providing human fetal tissue, whether used in a lab for research or transplanted into an individual.

In the case of non-transplantation research use, federal law bars anyone from acquiring, receiving, or otherwise transferring human fetal tissue “for valuable consideration if the transfer affects interstate commerce.”³⁰ This means the law bans anyone from buying or selling (or obtaining something of value in exchange for) fetal tissue. The law does allow entities to provide it for a reasonable fee, however, to cover the costs of “transportation, implantation processing, preservation, quality control, or storage.”³¹ The law does not define “reasonable.”

Federal law uses similar language to ban the sale of human organs (including those derived from a fetus) for transplantation into humans. It is against the law “for any person to acquire, receive, or otherwise transfer any human organ for valuable consideration for use in human transplantation if the transfer affects interstate commerce.”³²

³⁰ 42 U.S. Code, sec. 289g-2(a) (2012).

³¹ 42 U.S. Code, sec. 289g-2(e)(3) (2012). Congressional Research Service has said the following about this law: “While this provision prohibits the sale or purchase of fetal tissue itself, the term valuable consideration does not include reasonable payments associated with the transportation, implantation, processing, preservation, quality control, or storage of human fetal tissue. Thus, tissue companies may charge researchers to recover the costs associated with these types of activities.”

³² 42 U.S. Code, sec. 274e (2012).

It is unclear whether these laws apply to research that is privately funded, which is the current situation at the University of Minnesota. Nonetheless, the University has decided as a matter of policy to follow these standards regardless of the funding source.

Soliciting Human Fetal Tissue Prohibited

In addition to banning profit-making when providing fetal tissue, federal law also bars anyone involved in interstate commerce from soliciting or knowingly acquiring human fetal tissue from a pregnancy deliberately initiated to provide fetal tissue for research.³³

Federally Funded Fetal Tissue Transplantation Research

The federal government places additional requirements on entities that receive federal funding for research that uses tissue for human transplantation.

As a condition of receiving federal funding, entities such as the University must obtain signed, written statements from various parties ranging from the tissue donor to the attending physician to the researcher.³⁴ For example, the donor must provide a signed, written statement that says she donates the tissue for research, with no restriction on who may receive transplantations of the tissue, and that she does not know the identity of these individuals.³⁵

The attending physician who obtains the tissue from the donor must also provide a signed, written statement that includes several requirements. For example, in cases of an induced abortion, the physician must attest that the woman consented to the abortion *before* the physician requested or obtained consent to donate the tissue for research; the physician did not alter the timing, method, or procedures of the abortion solely to obtain the tissue; and the physician performed the abortion in accordance with state law.³⁶

FEDERAL REGULATIONS

Certain regulations may also apply to fetal tissue research that the U.S. Department of Health and Human Services (HHS) conducts or supports under HHS Regulations for the Protection of Human Subjects.³⁷ For example, regulations prohibit researchers from: attempting to induce a woman to end a pregnancy with money or other means;³⁸ playing a part in any decisions as to timing, method, or procedures to end a pregnancy;³⁹ and determining the viability of a neonate (newborn).⁴⁰ The University

³³ 42 U.S. Code, sec. 289g-2(c) (2012). The law also bans anyone from knowingly acquiring tissue or cells from a human embryo or fetus that was created in the uterus of an animal.

³⁴ 42 U.S. Code, sec. 289g-1 (2012).

³⁵ 42 U.S. Code, sec. 289g-1(b)(1) (2012).

³⁶ 42 U.S. Code, sec. 289g-1(b)(2) (2012).

³⁷ 45 CFR, sec 46 (2018).

³⁸ 45 CFR, sec. 46.204(h) (2018).

³⁹ 45 CFR, sec. 46.204(i) (2018).

⁴⁰ 45 CFR, sec. 46.204(j) (2018).

said in cases where the research is “greater than minimal risk,” it uses these regulations as a framework for review even if the research is not funded by HHS.

STATE LAW

Minnesota Anatomical Gift Act

In 1991, the Legislature amended the state’s Anatomical Gift Act with language that significantly affects how—and from whom—University researchers may lawfully obtain fetal tissue.⁴¹ The amendment changed the definition of “decendent” to say:

Decendent means a deceased individual whose body or part is or may be the source of an anatomical gift. The term includes a stillborn infant or an embryo or fetus that has died of natural causes in utero.⁴² [New language underlined.]

We asked the director of the University’s Anatomy Bequest Program (ABP) about the law’s impact. She told us it means the program does not accept donations from induced abortions that occurred in Minnesota.⁴³ Consistent with the director’s statement, the University’s policies on the acquisition of fetal tissue says:

ABP will acquire human fetal tissue from tissue procurement organizations or clinics outside Minnesota that operate in compliance with federal law and applicable state laws and certify they do not obtain human fetal tissue from abortions performed in Minnesota. ABP also may accept donations of human fetal tissue obtained from a stillborn infant, or an embryo or fetus that died of natural causes in utero as authorized under applicable state laws.⁴⁴

Human Organism Research Law

Minnesota law also restricts research on in vitro embryos. With two exceptions, the law prohibits research as well as buying and selling any living human conceptus (human organism) conceived either in the human body or produced in an artificial environment from fertilization through the first 265 days thereafter.⁴⁵ The section

⁴¹ The state enacted its Anatomical Gift Law originally in 1969 (*Laws of Minnesota* 1969, Chapter 79). It was modeled after a draft proposed by the National Conference of Commissioners on Uniform State Laws.

⁴² *Laws of Minnesota* 1991, chapter 202, sec. 20, subd. 3. In 2007, the Legislature further amended Minnesota’s Anatomical Gift Act and named it the *Darlene Luther Revised Uniform Anatomical Gift Act* in honor of a former member of the Minnesota House of Representatives who died of cancer in 2002. The limitation on donations from elective abortions remained, and is in current law (*Minnesota Statutes* 2018, Chapter 525A).

⁴³ Angela McArthur, Director, Anatomy Bequest Program, University of Minnesota, interview by Elizabeth Stawicki, Legal Counsel, and James Nobles, Legislative Auditor, Office of the Legislative Auditor, June 1, 2018.

⁴⁴ University of Minnesota, *Acquisition, Use, and Disposition of Donated Human Fetal Tissue for Research (Non-Transplantation) or Teaching* (effective February 2016, revised January 2018). The University’s policy governing fetal tissue for transplantation research contains similar language.

⁴⁵ The section allows experimentation to protect the life or health of the human organism or if it is harmless to the human organism. *Minnesota Statutes* 2018, 145.422, subds. 1 and 2.

defines “living” as showing evidence of life, such as movement, heart or respiratory activity, or the presence of electrical signals in the brain or heart.⁴⁶

2017 Minnesota Law Specific to the University

During the 2017 regular session, the Minnesota Legislature added a provision to the Higher Education Appropriations Act, which tightened controls on the University’s research using human fetal tissue. Among other things, that provision requires researchers to obtain prior approval from review boards and file annual reports to the Legislature.⁴⁷ The provision mandates the University take some actions and requests others.

Fetal Tissue Research Committee (FTR). Specifically, researchers **must** obtain prior approval from the “Fetal Tissue Research Committee” (FTR), a University committee which oversees, reviews, and approves or denies research using human fetal tissue.⁴⁸ FTR **must** consider whether the research could use alternatives to fetal tissue. Researchers wanting to use fetal tissue from abortions **must** also provide a written narrative justifying using tissue from abortions and whether there are alternatives, including fetal tissue not from abortions. FTR **must** submit its decision to a University Institutional Review Board (IRB).⁴⁹ The Legislature *requests* the IRB review FTR’s conclusions to determine if the committee considered all alternatives.⁵⁰

Annual Report to the Legislature. The University’s Board of Regents **must** submit an in-depth annual report to the Legislature that details all of the proposals researchers submitted to FTR or IRB.⁵¹ The report must include:

- All fetal tissue research proposals filed with FTR or IRB (including the written narrative);
- Whether the research proposal involved aborted fetal tissue;⁵²
- The committee or IRB’s action; and

⁴⁶ *Minnesota Statutes* 2018, 145.421, subd. 3.

⁴⁷ *Laws of Minnesota* 2017, chapter 89, art. 2, sec. 19, codified as *Minnesota Statutes* 2018, 137.47.

⁴⁸ *Minnesota Statutes* 2018, 137.47, subd. 2(a).

⁴⁹ Institutional Review Boards (IRBs) are the groups within research institutions established to protect the rights and welfare of human research subjects. They have authority to approve, disapprove, or modify proposals to conduct biomedical and behavioral health research that involve human subjects. See <https://grants.nih.gov/policy/clinical-trials/glossary-ct.htm#InstitutionalReviewBoardIRB>, accessed October 8, 2018.

⁵⁰ *Minnesota Statutes* 2018, 137.47, subd. 2(b).

⁵¹ *Minnesota Statutes* 2018, 137.47, subd. 3. No later than January 15 of each year, the Board of Regents must submit a report to the chairs and ranking minority members of the legislative committees with jurisdiction over higher education policy and finance and health and human services policy and finance.

⁵² The Legislature’s definition of aborted fetal tissue refers to elective or induced abortions only. It does not include spontaneous abortions also known as miscarriages.

- List of all new or ongoing fetal tissue research projects at the University.⁵³

The report **must not** include a researcher's name, other identifying information, contact information, or the location of a laboratory or office.⁵⁴

Education and Training. In addition, the Legislature **requested** that the University conduct education programs for all students and employees performing research using fetal tissue. The Legislature requested that the University conduct training on relevant federal and state laws, university policies and procedures, and professional standards related to “respectful, humane, and ethical treatment of fetal tissue in research.”⁵⁵

Disposal of Aborted or Miscarried Fetuses

Minnesota law regulates the disposal of fetuses that result from either an elective or spontaneous abortion.⁵⁶ The purpose of the law is to provide “for the dignified and sanitary dispositions...of human fetuses in a uniform manner.”⁵⁷ The remains must be disposed of by cremation, internment by burial, or by a manner directed by the health commissioner.⁵⁸

UNIVERSITY FETAL TISSUE POLICIES

The University has two administrative fetal tissue policies.⁵⁹

- *Acquisition, Use, and Disposition of Donated Human Fetal Tissue for Transplantation Research.* Originally effective December 2003, revised January 2018.⁶⁰

⁵³ The list must also include the project's: (1) FTR or IRB approval date; (2) the source of funding; (3) the goal or purpose; (4) whether the fetal tissue used is aborted fetal tissue or non-aborted fetal tissue; (5) the source of the fetal tissue used; (6) references to any publicly available information about the project, such as National Institutes of Health grant award information; and (7) references to any publications that resulted.

⁵⁴ *Minnesota Statutes* 2018, 137.47, subd. 3(b).

⁵⁵ *Minnesota Statutes* 2018, 137.47, subd. 4.

⁵⁶ *Minnesota Statutes* 2018, 145.1621. In addition, the University is subject to *Minnesota Statutes* 2018, Chapter 149A, which regulates “the removal, preparation, transportation, arrangements for disposition, and final disposition of dead human bodies for purposes of public health and protection of the public.”

⁵⁷ *Minnesota Statutes* 2018, 145.1621, subd. 1.

⁵⁸ *Minnesota Statutes* 2018, 145.1621, subd. 4. This section of the law was in dispute between Pro-Life Action Ministries and the University of Minnesota. We discuss the case in Appendix B.

⁵⁹ According to the University, in many cases administrative policies are established to provide rules and guidelines for implementing many Board of Regents policies, but they may also be established “independent of and for reasons other than implementing Board policy.” For example, the Board has not issued a policy on the use of fetal tissue in research and transplantation at the University but, as noted above, there are administrative policies.

⁶⁰ University of Minnesota, *Acquisition, Use, and Disposition of Donated Human Fetal Tissue for Transplantation Research* (effective December 1, 2003, revised January 5, 2018).

- *Acquisition, Use, and Disposition of Donated Human Fetal Tissue for Research (Non-Transplantation) or Teaching*. Originally effective February 2016, revised January 2018.⁶¹

Common Provisions

The policies cover tissue that comes from fetuses, including embryos that were stillborn or as a result of an elective abortion or miscarriage. In addition, they both:

- Prohibit research on a living human conceptus in Minnesota law, which includes a living human fetus.⁶²
- Prohibit personnel from offering or paying for any costs associated with a donor's elective abortion.
- Require researchers to obtain prior approval before they can begin their projects. The 2017 law, which tightened controls on this research, included this requirement.⁶³ The non-transplantation policy requires approval from FTR and the transplantation policy requires approval from the IRB, which will also obtain input from FTR.
- Require researchers to notify the Anatomy Bequest Program prior to obtaining human fetal tissue. They must either obtain the tissue from the Anatomy Bequest Program or obtain the program's approval for the source of the tissue. The program will acquire the tissue from organizations outside Minnesota that comply with state and federal laws, and certify that the tissue did not come from elective abortions performed in Minnesota.
- Require all personnel, including students who work with human fetal tissue, to complete training.⁶⁴
- Require a separation of roles between the researcher and the attending physician treating the person undergoing an elective abortion. Researchers may not play

⁶¹ University of Minnesota, *Acquisition, Use, and Disposition of Donated Human Fetal Tissue for Research (Non-Transplantation) or Teaching* (effective February 2016, revised January 2018).

⁶² As discussed earlier, this requirement is in the Minnesota Human Organism Research Law. See footnotes 45 and 46.

⁶³ *Laws of Minnesota* 2017, chapter 89, art. 2, sec. 19, codified as *Minnesota Statutes* 2018, 137.47, subd. 2.

⁶⁴ Minnesota law does not require but does request that the University provide education related to the use of fetal tissue research. The University has mandated training for everyone (including students) who uses human fetal tissue in research or teaching. The Anatomy Bequest Program conducts the training, which covers federal and state laws, policies and procedures, and professional standards related to the respectful, humane, and ethical treatment of human fetal tissue in research. The program reports that as of August 7, 2018, 25 people have taken the training. Currently, the training is for non-transplant use of fetal tissue research. There is no transplantation equivalent because there has not been a research request since the Minnesota law took effect in May 2017. The Anatomy Bequest Program will produce training specific to transplant research involving fetal tissue if and when there is a request to ensure the material is the most current.

any part in the timing, method, or procedures used to end the pregnancy and may have no part in determining fetal viability.

- Require personnel to notify the Anatomy Bequest Program when the research or teaching has ended. They must also contact the program if they need the tissue longer than anticipated.
- Require the Anatomy Bequest Program to dispose of the tissue in a “dignified manner through cremation, burial, or other lawful disposition method.”

Differences

We found the policies have these differences:

- Although the 2017 fetal tissue law requires researchers to justify their need for the tissue, only the University’s non-transplantation policy explicitly requires this justification (the transplantation policy does not contain an explicit requirement).
- The non-transplantation policy requires the University to submit an annual report to the Minnesota Legislature. The transplantation policy does not include this requirement. We were told, however, that the annual report would include fetal tissue transplant research because the same entity that drafts the report—the Anatomy Bequest Program—is the same entity that obtains and tracks fetal tissue for all research at the University.
- In addition, the non-transplantation policy bars personnel who leave the University from transferring human fetal tissue to other institutions. They may not distribute fetal tissue to an internal or external researcher without prior approval from FTR and notifying the Anatomy Bequest Program. The transplantation policy does not include these prohibitions because there is not likely to be any remaining fetal tissue in transplant research because it would have been implanted into the living humans who are research participants.
- The transplantation policy has some additional requirements specific to transplantation. For example, researchers may not accept or use fetal tissue for transplantation into a donor’s relative or another person the donor designates unless the tissue was a result of a miscarriage or stillbirth. In addition, researchers must register with the University’s Research Compliance Office.
- There are also funding restrictions in connection with fetal tissue transplantation as well. For example, federal funds are only allowable when the donor does not know the transplant recipient.

Finally, we note that these two policies address complex subjects, and some provisions are not as clear as they should be. As a result, we had to ask University officials to interpret and clarify several provisions.

PRELIMINARY ASSESSMENT

Prior to 2016, the University did not have a process to oversee the use of fetal tissue in research at the University. As one University leader told us, “Fetal tissue wasn’t on anybody’s radar.”

Legislative questions, criticism, and the enactment of new laws forced the University to pay attention and take action. In this section, we offer a preliminary assessment of two key changes: (1) the creation of the Fetal Tissue Research Committee and (2) putting the Anatomy Bequest Program in charge of acquiring, tracking, and disposing of fetal tissue.

Given the short time these two changes have been in place and the few fetal tissue research projects University scientists have conducted recently, our assessment is preliminary.

FETAL TISSUE RESEARCH COMMITTEE

As noted earlier, both state law and University policy give the University’s Fetal Tissue Research Committee (FTR) an important role in approving and overseeing research that uses fetal tissue. For example, University policy says:

FTR has authority to approve, require modifications to or disapprove proposed research, and to suspend or terminate approved research for serious non-compliance or unanticipated problems.⁶⁵

Justifying Use of Fetal Tissue

State law and University policy also both require researchers to justify using fetal tissue from induced abortions. State law says:

If the proposed research involves aborted fetal tissue, the researcher must provide a written narrative justifying the use of aborted fetal tissue and discussing whether alternatives to aborted fetal tissue, including non-aborted fetal tissue, can be used.⁶⁶

University policy says:

FTR will consider whether alternatives to human fetal tissue would be sufficient for the research and will require researchers to provide a written explanation of the need for human fetal tissue from induced abortions and

⁶⁵ University of Minnesota, *Acquisition, Use, and Disposition of Donated Human Fetal Tissue for Research (Non-Transplantation) or Teaching* (effective February 2016, revised January 2018). The University’s policy governing fetal tissue for transplantation research contains similar language. *Minnesota Statutes* 2018, 137.47, subd. 1(e), recognizes the Fetal Tissue Research Committee as “an oversight committee at the University of Minnesota with the responsibility to oversee, review, and approve or deny research using fetal tissue.”

⁶⁶ *Minnesota Statutes* 2018, 137.47, subd. 2(a).

whether alternatives, including non-aborted human fetal tissue, can be used for the research.⁶⁷

To fulfill these requirements, University researchers applying to use human fetal tissue explain on a form they submit to FTR why the use of fetal tissue is necessary.⁶⁸

We reviewed the forms FTR considered during a meeting in May 2016 and noted that each research proposal included a justification for why the use of fetal tissue was necessary. One of the proposals came from the researcher trying to determine whether the Zika virus directly infects cells in the human fetal brain, and if so, how.⁶⁹

On the FTR form, the researcher was asked:

Is fetal tissue necessary for this research? Are there other methods that could achieve substantially the same aims?

The researcher answered:

Human fetal brain tissue is required to determine whether the Zika virus is directly involved in damaging the development of the human fetal brain. Fetal brain tissue from other species could be used but the receptors and molecular mechanisms in other species may differ from that of the developing human fetal brain.

In addition to reviewing documents, we interviewed the two researchers who had been approved to use human fetal tissue in a research project. We wanted to understand their personal views on using fetal tissue in research, and at no point did we feel that either researcher took the use of human fetal tissue lightly. They said they would use alternatives if possible, but they did not believe meaningful alternatives exist. For example, we asked the faculty member researching depression and schizophrenia whether adult tissue would be an alternative. The researcher told us adult tissue would not work because illnesses such as schizophrenia likely originate at the time the fetal brain is developing. To begin to understand how those illnesses begin means understanding how the brain is developing.

The Zika researcher also told us that he understands that some people object to using fetal tissue in research but it is the only legitimate way to get answers to certain questions. As a neuroscientist, he said he has been shocked to see the damage a virus such as Zika can do to the brain. He said the tissue used for research is already dead and could be disposed of or used to help advance knowledge and help find a cure.

⁶⁷ See footnote 65.

⁶⁸ A copy of the form is in Appendix C.

⁶⁹ As explained in footnote 26, we do not identify researchers based on *Minnesota Statutes* 2018, 137.47, subd. 3(b).

Dates on FTR Application Forms

During our review, we expressed concern that the FTR application forms researchers use to propose, justify, and amend their projects do not include dates. As a result, we could not determine when researchers provided their proposals and amendments to FTR. When we asked about this, FTR's chair told us that proposals come in by e-mail with a time stamp and, therefore, requiring researchers to date the forms was unnecessary.

Despite the indirect dating that an e-mail submission provides, we still failed to understand why the University would not include a date on the forms and recommended that they do so. To us, not including a date raised questions about transparency. While not agreeing with our transparency concern, University officials agreed that requiring forms to be dated could be easily done and said "we will do so."⁷⁰

Ongoing Oversight

During our review, we asked about ongoing oversight of fetal tissue research projects by FTR and were told:

The researchers are given an approval letter for what they proposed to do. [But] FTR doesn't have inspectors...to see if the researchers are doing what they said they're supposed to be doing.⁷¹

We told University officials that this statement by the FTR chair concerned us and, as a result, we questioned whether there was adequate ongoing oversight of research using fetal tissue. We received the following response:

While the FTR does not conduct inspections, we disagree with any suggestions that this equates to inadequate oversight.... FTR's primary role is to review the scientific merit and ethical justification for research that uses fetal tissue and to consider whether alternatives to fetal tissue would be sufficient. This necessarily is done before the research (or any amendment to the research) begins. The Anatomy Bequest Program (ABP) plays an active role in ongoing oversight of the procurement, use and disposition of this tissue once the research has been approved. To the extent ABP identifies serious problems with respect to use of the tissue, it would report this to the Office of the Vice President for Research (which includes FTR) and the Academic Health Center leadership. At that point, FTR would review the non-compliance and determine whether it was

⁷⁰ Frances Lawrenz, Associate Vice President for Research, University of Minnesota, letter to James Nobles, Legislative Auditor, October 30, 2018.

⁷¹ Greg Park, Assistant Director Biotechnology Activities Oversight and Chair of Fetal Tissue Research Committee, University of Minnesota, interview by Elizabeth Stawicki, Legal Counsel, and James Nobles, Legislative Auditor, Office of the Legislative Auditor, July 13, 2018. Frances Lawrenz, Associate Vice President for Research, University of Minnesota, also participated in this interview.

serious enough to warrant suspending or terminating the approved research (an action also within the authority of senior leaders).⁷²

Again, we cannot assess whether this approach to oversight will be effective since there is little experience by which to judge. On the other hand, we are impressed with the professionalism of the University's Anatomy Bequest Program.

ANATOMY BEQUEST PROGRAM

The Anatomy Bequest Program is within the Office of Medical Education and also reports to the Dean of the Medical School and Vice President for Research. The program's director, Angela McArthur, is a national expert on ethical standards for anatomical donation for education and research.⁷³ She has been with the Program for 16 years and has served as director for the past 7 years.

In an interview with us, McArthur said that the program emphasizes that whole body donations are gifts, not cadavers. "When you start to think of the word donor, it's to remind you that it's a gift," she said. McArthur told us that she views fetal tissue in the same way.⁷⁴

Vetting Fetal Tissue Suppliers

Since the Anatomy Bequest Program took responsibility for obtaining fetal tissue for University of Minnesota researchers, McArthur began personally vetting suppliers. Her vetting included the nonprofit Advanced BioScience Resources, Inc. (ABR), which had been a prominent supplier in the past.

McArthur said she visited ABR in California to audit their procedures. As part of the audit, she said she toured the facility and viewed a variety of documents, including the forms used to obtain consent from patients, how staff were trained, and how the consent forms were stored. In the end, she did not approve ABR as a supplier to the University because it did not meet her standards.

In addition, McArthur contacted StemExpress, another previous supplier, and asked if she could visit and audit their documents and she said they did not return her call. As a result, she did not approve StemExpress as a supplier either.

McArthur, however, has approved two other suppliers: the University of Washington and Newcastle University in the United Kingdom. McArthur said she did not personally visit their locations but performed what is known as a desktop audit—she looked in-depth at all of their policies, procedures, manuals, and consent documents, as well as interviewing staff members. She said she was impressed with both

⁷² See footnote 70.

⁷³ McArthur served as a subject matter expert in developing national standards for the American Association of Tissue Banks. She also served several years on the Leadership Council for the American Association of Clinical Anatomists.

⁷⁴ Angela McArthur, Director, Anatomy Bequest Program, University of Minnesota, interview by Elizabeth Stawicki, Legal Counsel, and James Nobles, Legislative Auditor, Office of the Legislative Auditor, June 1, 2018.

organizations and consequently approved them to provide tissue. She said Newcastle, for example, has a strong tracking mechanism.

Tracking Fetal Tissue

When the Huron Group released its report in 2016, the University had no one central entity to track where researchers acquired fetal tissue, who was using it, for what purpose, and where the tissue was located. McArthur used the Huron Report results to take an inventory and follow up with researchers, including those who had left the University.

The Anatomy Bequest Program tracks fetal tissue as part of the same database it uses to track adult donors.⁷⁵ The program creates a documented chain of custody for that tissue from arrival to disposition. Once the program receives the fetal tissue, it enters a number of key pieces of information into its database. These include: an acquisition number; the provider's unique identifier (e.g., Newcastle University); dates when the tissue was produced, shipped, and received; fetus age; sex if known; researchers who requested the tissue; payment invoice number; and date of cremation. If research divides the tissue, those portions will receive subsequent acquisition numbers. For example, if fetal tissue has the number FS114, the program will assign those portions as FS114-01, FS114-02, and so on.

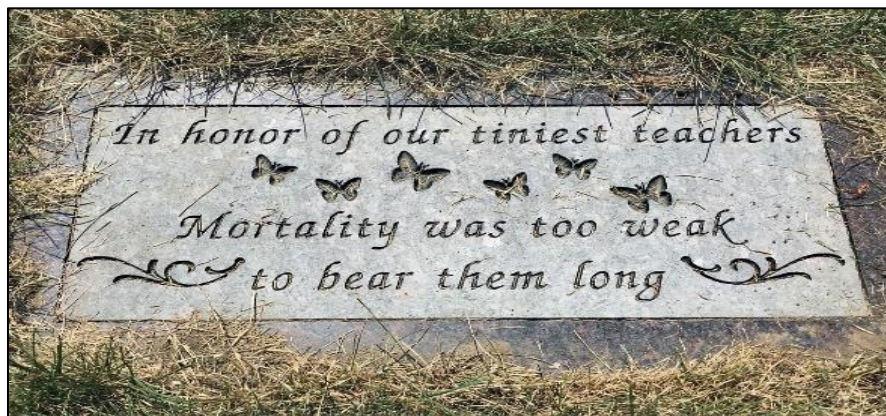
In addition, the University created a separate shared database in which researchers and the Anatomy Bequest Program managers can enter and edit the information. The program reconciles this data. McArthur said she performs periodic audits and manually backs up this data.

Disposal of Fetal Tissue

The University disposes of the individual fetal tissue remains by cremating them at an off-site location where the University also cremates the remains of whole-body donations. We did not view any cremations, but McArthur told us that the fetal tissue remains are cremated individually, returned in marked urns, and are currently stored at the Anatomy Bequest Program. We did see what appeared to be containers with numbers at the program office. Eventually these fetal tissue remains will be buried at Lakewood Cemetery in Minneapolis where the University has two marked gravesites. One of those gravesites is for whole-body donations.⁷⁶ Another site is for the fetuses and embryos from the historical teaching collection, which we referenced in the Introduction of this report. That site is designated with the grave marker shown in the following photo and will at some time in the future include the fetal tissue remains used in research.

⁷⁵ McArthur said that only a limited number of managerial staff perform the data entry related to fetal tissue.

⁷⁶ In some cases, families prefer to have the donated remains buried at Lakewood, a burial which the University provides free of charge.



Office of the Legislative Auditor Photo

McArthur told us—and we verified with the President of Lakewood Cemetery—that the University held a memorial service and burial for the 125 embryos and fetuses at Lakewood on March 3, 2017.

Newcastle University requires the University of Minnesota to return the tissue it provides. McArthur said that if the fetal cells are still in vials, the vials themselves would be sent back to Newcastle as well. She said the University of Washington does not require the tissue be returned but does require the University to explain how it disposed of the tissue.

CONCLUDING COMMENTS

As we have noted in this report, controversy forced the University of Minnesota to tighten its controls over how researchers acquire, use, and dispose of fetal tissue. In addition to changes the University initiated, the Legislature mandated requirements that will create more transparency and accountability.

It is too early to offer a definitive conclusion on what impact these changes will have on their intended objective. However, it does appear that the controversy over the use of fetal tissue in research at the University of Minnesota, and possibly some of the added outside controls and oversight, has caused some researchers to stop using fetal tissue or leave the University. While some people will see this as a positive development, others will be troubled that the University of Minnesota has minimal involvement in this important area of biomedical research.

The University officials we interviewed did not express alarm that the University's involvement in fetal tissue has declined. We think this reflects the fact that the University is heavily involved in the use of stem cells in both research and medical treatments. Officials told us that the University would be extremely concerned about any negative impact on its stem cell programs.



APPENDIX A

STEM CELL RESEARCH AT THE UNIVERSITY OF MINNESOTA

As noted earlier in this report, we did not include stem cell research within our review. But given the many common characteristics between the stem cell and fetal tissue research, we use this appendix to provide some basic information about stem cells and stem cell research at the University of Minnesota.

Stem Cells

Stem cells are simple cells with enormous potential. They contain the essential biological material and mechanisms that allow more complex organisms to develop. They are called stem cells because they are the beginning—the stem—from which further growth and specialization occurs. According to the National Institutes of Health:

Stem cells have the remarkable potential to develop into many different cell types in the body during early life and growth. In addition, they serve as a sort of internal repair system, dividing essentially without limit to replenish other cells as long as the person or animal is still alive. When a stem cell divides, each new cell has the potential either to remain a stem cell or become another type of cell with a more specialized function, such as a muscle cell, a red blood cell, or a brain cell.¹

Given these properties, scientists have been studying and experimenting with stem cells for several decades. They started by obtaining stem cells from mice; then, in 1998, scientists at the University of Wisconsin derived stem cells from five-day-old embryos produced by in vitro fertilization.² More recently, researchers have discovered ways to obtain stem cells from adults and to genetically reprogram certain specialized cells to give them stem-cell-like characteristics. Scientists call these reprogrammed cells “induced pluripotent stem cells” (iPSCs).³

This reprogramming breakthrough has potentially given scientists and medical professionals the ability to take cells from a patient with a serious medical condition (e.g., Parkinson’s disease, diabetes, cardiovascular disease, etc.) and reprogram them to be therapeutic agents within the patient’s body. According to one stem cell researcher,

¹ National Institutes of Health, *Stem Cell Basics I. Introduction: What are stem cells, and why are they important?*, <https://stemcells.nih.gov/info/basics/1.htm>, accessed October 8, 2018.

² Judith A. Johnson, Specialist in Biomedical Policy, and Edward C. Liu, Legislative Attorney, *Stem Cell Research: Science, Federal Research Funding, and Regulatory Oversight*, Congressional Research Service (Washington, DC, 2012), 3. In vitro fertilization is a process in which medical professionals remove eggs from a woman’s ovary and fertilize them with sperm in a laboratory procedure. The fertilized eggs (technically called “blastocysts” but generally referred to as embryos) that are not implanted in a woman’s uterus are discarded or donated to scientists for research.

³ See National Institutes of Health, *Stem Cell Basics VI. What are induced pluripotent stem cells?*, <https://stemcells.nih.gov/info/basics/6.htm>, accessed July 9, 2018. Also see Charles A. Goldthwaite, Jr., Ph.D., *The Promise of Induced Pluripotent Stem Cells (iPSCs)*, National Institutes of Health, https://stemcells.nih.gov/info/Regenerative_Medicine/2006Chapter10.htm, accessed October 8, 2018.

the reprogramming technique promises to become a powerful new way to treat common but complex diseases. The researcher, Dr. Charles Goldthwaite, added:

[I]nduced pluripotent stem cells have captured the imagination of researchers and clinicians seeking to develop patient-specific therapies. Reprogramming adult tissues to embryonic-like states has countless prospective applications to regenerative medicine, drug development, and basic research on stem cells and developmental processes.⁴

Despite these and other benefits, stem cell research has a controversial history triggered largely by its initial use of stem cells from discarded embryos created in fertility clinics.⁵ The controversies have made stem cell research the subject of intense policy debates and regulatory actions by Congress and Presidents.

Regulation of Stem Cell Research

The regulatory structure that governs stem cell research is complex, and it has changed significantly over time. Because we excluded stem cell research from the scope of our review, we did not conduct a comprehensive examination of the laws, regulations, and policies that govern stem cell research.

For an overview of the stem cell regulatory structure and the history of its development, we suggest *Stem Cell Research: Science, Federal Research Funding, and Regulatory Oversight*, prepared by the Congressional Research Service.⁶ It covers actions by Congress, executive administrations, and the courts starting in 1978 through the Obama Administration.

Stem Cell Research at the University of Minnesota

In December 2003, the University adopted an administrative policy, *Conducting Research with Human Embryos and Embryonic Stem Cells*. The University has revised the policy several times, with the last revision in 2017.⁷ According to the University, it based its policy primarily on the National Academies of Science Guidelines for Embryonic Stem Cell Research.⁸

⁴ Charles A. Goldthwaite, Jr., Ph.D., *The Promise of Induced Pluripotent Stem Cells (iPSCs)*, National Institutes of Health, https://stemcells.nih.gov/info/Regenerative_Medicine/2006Chapter10.htm, accessed October 8, 2018.

⁵ For an overview of the stem cell controversy, see John A. Robertson, “Embryo Stem Cell Research: Ten Years of Controversy,” *The Journal of Law Medicine & Ethics*, 38, no. 2 (Summer 2010): 175-190. All the articles in the Summer 2010 issue of *The Journal of Law Medicine & Ethics* are about various controversies related to stem cell research.

⁶ Judith A. Johnson, Specialist in Biomedical Policy, and Edward C. Liu, Legislative Attorney, *Stem Cell Research: Science, Federal Research Funding, and Regulatory Oversight*, Congressional Research Service (Washington, DC, 2012), 3.

⁷ In 2015, the University amended the policy to cover certain additional types of stem cell research not dependent on embryos as their source.

⁸ See <https://nas-sites.org/stemcells/national-academies-guidelines>, accessed September 8, 2018.

The policy expressly authorizes University researchers to engage in stem cell research “for therapeutic purposes,” but it also imposes a range of requirements. For example:⁹

- The University’s Stem Cell Research Oversight (SCRO) Panel must review and approve the research, regardless of eligibility for federal funding, before the research begins.
- When required by other University policies or federal regulations, researchers must also obtain approval from other University regulatory bodies, such as the Institutional Review Board (IRB).
- Federal and state money may only be used on research if the embryonic stem cells involved in the research were derived from discarded embryos created for reproductive purposes.
- Research projects that do not use federal or state money must still “register” their project with the University and meet certain other requirements.

While the University’s stem cell policy appears to establish comprehensive controls and requirements, we learned that oversight of stem cell research projects and record keeping is limited. For example, the assistant director of the University’s Office of Biotechnology Activities Oversight (OBAO) told us:

The OBAO does keep a record of human embryonic and human stem cell research conducted at the University, but these records are limited to the research that is subject to review by the Stem Cell Research Oversight (SCRO) Panel.... As such, the majority of the stem cell research performed at the University is excluded from oversight....

As a result, we were unable to obtain a comprehensive list of stem cell research projects or an overall assessment of the extent of stem cell research at the University. Nevertheless, the University’s participation in stem cell research appears significant.

For example, in 1999, the University established a Stem Cell Institute that facilitates collaboration among University faculty and staff that are involved in stem cell research. According to the Institute’s website, the Institute “draws together 50 investigators and 25 collaborating University departments to participate in stem cell research.”¹⁰

⁹ We have paraphrased the requirements to improve readability.

¹⁰ See <https://www.stemcell.umn.edu/>, accessed October 16, 2018.



APPENDIX B

Pro-Life Action Ministries v. Regents of the University of Minnesota

On October 19, 2016, Brian Gibson and Pro-Life Action Ministries (PLAM) petitioned a Hennepin County judge to order the University of Minnesota to show its authority for “procuring and using human fetal tissue for transplantation research.”¹ PLAM contended that the University was violating the state’s fetal disposal law. Specifically, PLAM argued that the law regulating the disposal of fetal remains from abortions and miscarriages limits laboratory tests on fetal tissue to three areas, and transplantation research is not one of them. The law at issue, *Minnesota Statutes* 2018, 145.1621, says:

Hospitals, clinics, and medical facilities in which abortions are induced or occur spontaneously or accidentally and laboratories to which the remains of human fetuses are delivered must provide for the disposal of the remains by cremation, interment by burial, or in a manner directed by the commissioner of health. The hospital, clinic, medical facility, or laboratory may complete laboratory tests necessary *for the health of the woman or her future offspring or for purposes of a criminal investigation or determination of parentage prior to disposing of the remains* [emphasis added].²

PLAM asked a Hennepin County judge to order the University to show why its research using fetal tissue outside these limits did not violate state law.³

On April 26, 2017, the judge dismissed the case on several grounds, including that PLAM lacked standing as a Minnesota taxpayer to bring the action and that PLAM failed to provide any evidence that the University’s research program violated state law.⁴

About a week after the judge’s dismissal, PLAM notified its attorney that certain state legislators had been making inquiries about the University and fetal tissue research and had obtained further information. In early July, the attorney wrote a letter to the judge that he found an e-mail that “revealed the University is procuring fetal tissue for the

¹ *Pro-Life Action Ministries, Inc. v. Regents of the University of Minnesota*, No. 27-CV-16-15359 (Hennepin County Dist. Ct. Oct. 19, 2016) (Petition for Writ of Quo Warranto). Writ of Quo Warranto means “by what authority,” which is a special legal action to challenge an ongoing exercise of official power. Bryan A. Garner, Editor in Chief, *Black’s Law Dictionary* (St. Paul: Thomson Reuters, 2014), 1447.

² *Minnesota Statutes* 2018, 145.1621, subd. 4.

³ *Pro-Life Action Ministries, Inc. v. Regents of the University of Minnesota*, No. 27-CV-16-15359 (Hennepin County Dist. Ct. Oct. 19, 2016) (Petition for Writ of Quo Warranto).

⁴ *Pro-Life Action Ministries, Inc. v. Regents of the University of Minnesota*, No. 27-CV-16-15359 (Hennepin County Dist. Ct. Apr. 26, 2017) (Order granting motion to dismiss).

unauthorized research complained about in its underlying” earlier request.⁵ (The e-mail included descriptions and sources of fetal tissue the University had obtained.)⁶

PLAM asked the judge to reconsider the case based on “newly discovered” evidence (the e-mail thread) but the judge denied PLAM’s request. The judge said that the e-mail did not qualify as newly discovered evidence because PLAM could have obtained that information “through discovery techniques with due diligence.”⁷

PLAM appealed its case to the Minnesota Court of Appeals. The University responded in court documents that the Legislature’s enactment of a Fetal Tissue Research law in 2017 rendered PLAM’s petition moot because the new law expressly contemplates that the University conducts research using fetal tissue.⁸

On August 20, 2018, the state Court of Appeals dismissed PLAM’s appeal. The Court agreed with the University that the Legislature’s passage of the Fetal Tissue Research law in 2017 rendered PLAM’s petition moot. The Court said PLAM’s purpose in pursuing its case was to require the University to answer how the University’s fetal tissue research is legal in light of the limitations contained within *Minnesota Statutes* 2018, 145.1621.⁹

The Court agreed that the Legislature addressed the question by the law it enacted in 2017. The Court said:

[F]etal-tissue research is permitted at the university so long as certain conditions are met and procedures are followed. The purpose of appellants’ petition has been satisfied—the legislature has expressly provided the authority whereby the university may conduct fetal-tissue research.¹⁰

PLAM has not filed an appeal to the Minnesota Supreme Court.

⁵ Erick G. Kaardal, Attorney, Pro-Life Action Ministries, letter to The Honorable Daniel C. Moreno, Hennepin County District Court, July 6, 2017.

⁶ Declaration of Erick G. Kaardal, *Pro-Life Action Ministries, Inc. v. Regents of the University of Minnesota*, No. 27-CV-16-15359 (Hennepin County Dist. Ct. 2017).

⁷ *Pro-Life Action Ministries, Inc. v. Regents of the University of Minnesota*, No. 27-CV-16-15359 (Hennepin County Dist. Ct. Aug. 3, 2017) (Order denying motion for reconsideration).

⁸ *Laws of Minnesota* 2017, chapter 89, art. 2, sec. 19.

⁹ *Pro-Life Action Ministries, Inc. v. Regents of the University of Minnesota*, Nos. A17-0971, A17-1958, 2018 Minn. App. Unpub. LEXIS 700, at *14 (August 20, 2018).

¹⁰ Same as footnote 4.

APPENDIX C

Fetal Tissue Research Committee Project Application Form

Application Number (assigned by Admin):

Principal Investigator Name:

Co-Investigator Name(s):

x500s or email addresses for all names:

Title of Application:

1. **Have you read and understood the policies related to the oversight of Fetal Tissue Research?**
<[Hyperlink](#)> or <<http://policy.umn.edu/research/fetalresearchnontrans>>

2. **Is the proposed research in compliance with University of Minnesota policies?**

3. **Is your proposed research funded? If so, please provide the source of the funding.**

4. **Has the proposed research undergone scientific review?**

5. **Please provide the scientific question or hypothesis to be tested.**

6. **Please provide a lay summary of the goals and methods for your application.**

7. **Please describe the human fetal tissue required for your research and the amount needed.**

*Please note that what you describe must match what you procure through the Anatomy Bequest Program.

8. University policy requires a written explanation of the need for human fetal tissue from induced abortions and whether alternatives, including non-aborted human fetal tissue, can be used for the research. The answers you provide below will be used verbatim in a required annual legislative report. This is also a requirement under Minnesota law. Thus, please answer “yes” or “no” to each question **and** provide a justification.

a. **Is fetal tissue necessary for this research?**

b. **Are there other methods or alternatives to use of human fetal tissue from induced abortions that could achieve substantially the same aims?**

- c. Minnesota law (Minn. Stat. 137.47) defines “non-aborted fetal tissue” as fetal tissue that is available as a result of a miscarriage or stillbirth, or fetal tissue from a living unborn child.” However, fetal tissue from a living unborn child may not be used in research except to protect the life or health of the fetus. Therefore, can fetal tissue from a miscarriage or stillbirth be used for your research (scientific justification, availability, etc.)?

9. Please check the following to confirm compliance with state and federal law:

☐ I will not perform research on a human fetus that meets the definition of a living human conceptus under Minnesota law (i.e., shows movement, heart, or respiratory activity, or the presence of electroencephalographic or electrocardiographic activity).

☐ I will not offer or provide payment for any costs associated with a donor’s induced abortion, nor have any part in decisions as to the timing, method or procedures to terminate a pregnancy, nor have any part in determining the viability of a donor’s fetus.

Please provide the materials submitted to funding sources for your project(s).

Please complete this document and email all files to fttr@umn.edu.

Please note that you must arrange for the procurement and disposal of the fetal tissue through the Anatomy Bequest Program (ABP) or obtain approval from ABP to use fetal tissue supplied by a research sponsor or collaborator.

Please note that after approval by the FTR Committee, the next step is to contact the Anatomy Bequest Program (ABP) for an ABP proposal form at bequest@umn.edu or 612-625-1111.

December 13, 2018

James Nobles
Office of the Legislative Auditor
658 Cedar Street, Room 140
St. Paul, MN 55155

Dear Mr. Nobles:

This letter is the University of Minnesota's formal response to the December 2018 audit report by the Office of the Legislative Auditor (OLA), *University of Minnesota: Use of Fetal Tissue in Research*.

Since early 2016, the University has worked hard to improve its oversight of fetal tissue research. We have implemented a centralized system requiring prior review and approval for the research and a centralized process for acquisition, tracking and respectful disposition of the fetal tissue. We further revised our policies and procedures in January 2018 in order to comply with the requirements of the new law passed by the Legislature last year. We appreciate OLA's acknowledgement of the numerous steps taken by the University in this regard.

Based on OLA observations in the report, the University will make a minor change to its fetal tissue research application form and will evaluate its two fetal tissue research policies to clarify language and correct any discrepancies that may exist.

The University is mindful of the sensitivity of this research and the importance of treating fetal tissue respectfully. As the University's faculty pursues this area of scientific inquiry for therapeutic research purposes, the University is dedicated to honoring our obligations under the law.

Sincerely,



Eric W. Kaler
President

EWK/js

cc: Christopher Cramer, Vice President for Research
Frances Lawrenz, Associate Vice President for Research
Gregory Park, Assistant Director, Office of Biotechnology Activities Oversight
Angela McArthur, Director, Anatomy Bequest Program
Brian Slovut, Deputy General Council
Gail Klatt, Director, Office of Internal Audits



For more information about OLA and to access its reports, go to: www.auditor.leg.state.mn.us.

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