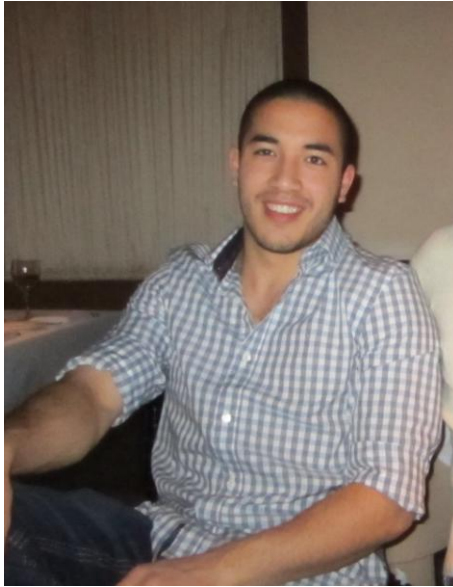


## *A New Approach to Early Amniocentesis: The Amino Project*

By Daniella Newman, Sophomore, History major, Natural Science Minor



Amniocentesis is a medical procedure used in prenatal diagnosis of chromosomal abnormalities and fetal infections. Doctors categorize early amniocentesis as occurring before the 15<sup>th</sup> week of pregnancy. Nathaniel Isaac Sugiyama, a senior majoring in Business Administration at the Marshall School of Business at USC with a minor in natural science in Dornsife College, is currently researching the risks associated with early amniocentesis with Dr. Cristiane Guberman. Dr. Guberman completed her obstetrics and gynecology residency at the Keck School of Medicine in 2006 and is currently a fellow at Harbor-UCLA.

Whereas current literature focuses on weeks 11 through 13 and 15 weeks and beyond of pregnancy, Nathaniel and Dr. Guberman are analyzing the risks of amniocentesis between 13 and 15 weeks. Although the research is still in its early stages, the researchers have not seen a significant increase in common risks associated with regular amniocentesis.

### **From Business to Medicine: Sugiyama's journey**

Unlike many pre-medical students at USC, Nathaniel Isaac Sugiyama was originally interested in business, particularly finance. But, after an internship at Linda S. Cowan M.D., A.P.C. maternal fetal medicine clinic in downtown Los Angeles, he found his passion for medicine. This internship at a maternal fetal medicine (MFM) clinic propelled him to add a natural science minor in his junior year and become a pre-medical student. Two years later, Nathaniel was promoted to business manager of the medical practice and currently works there in addition to being a full time student. Nathaniel is also involved on campus in community service organizations such as Peer Health Exchange. As a senior health educator in Peer Health Exchange, Nathaniel teaches high school students in the community about health related topics and how to make well informed decisions.

Nathaniel's background, working at a MFM clinic, research, and teaching in Peer Health Exchange, provide a strong foundation for working as a physician in an underserved urban environment. In the future, Nathaniel plans to work in downtown Los Angeles as a perinatologist. He has a particular interest in working with diabetics, derived from his experience interning at the high-risk maternal fetal medicine clinic.

### **Dr. Cristiane Guberman**

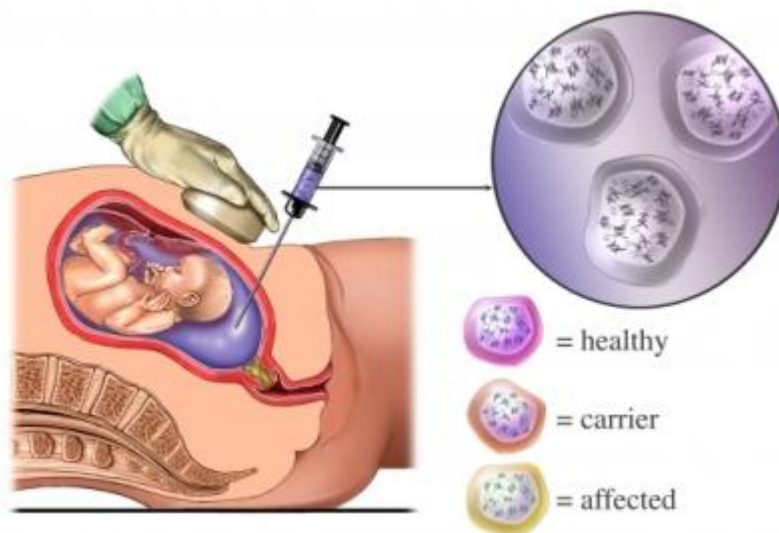
Nathaniel's mentor, Dr. Cristiane Guberman, was born and raised in Brazil. There, she completed her medical degree, and immigrated to the USA to pursue her passion for research. Dr. Guberman completed her obstetrics and gynecology residency at the Keck School of Medicine in 2006. She then worked in private practice in Appalachia Kentucky, a severely underserved area, until 2010, when she began a maternal fetal medicine fellowship at Harbor-UCLA.

To date, Dr. Guberman has published more than 4 peer review articles, 2 book chapters, and 10 abstracts. She continues to dedicate herself to research particularly, regarding the management of high-risk pregnancies and public health.

## The Amino Project

Currently, the Amino Project is in its early stages, the study has the potential to reveal major implications for prenatal care. The Amino Project aims at making early amniocenteses a more common practice.

Amniocentesis is a medical procedure used in prenatal diagnosis of chromosomal abnormalities, a procedure that involves fetal infections, which can also be used to determine the sex of the fetus. This procedure is conducted by sampling a small amount of amniotic fluid (approximately 20ml) by inserting a needle through the mother's abdominal wall, the wall of the uterus, and then finally into the amniotic sac. Once the amniotic fluid has been extracted the fetal cells are separated from the sample, the cells are grown, fixed, and stained. The chromosomes are examined for abnormalities. Some of the most common abnormalities detected include Down syndrome (trisomy 21), Edwards syndrome (trisomy 18), and Turner Syndrome (monosomy X). This is a very low risk procedure, and the puncture heals and the amniotic sac replenishes the fluid within 48 hours.



Currently, literature on early amniocentesis concentrates on 11-13 weeks and literature on amniocentesis focuses on 15 weeks and beyond. Very little research has been published on the time in between. Nathaniel and Dr. Guberman are directing their research to this in-between period. The team is reviewing clinical data from the Linda S. Cowan M.D., A.P.C. maternal fetal medicine clinic in downtown Los Angeles. This clinic is a high volume clinic where physicians see between 80-100 high-risk pregnancy patients daily. High-risk pregnancies include triplets, conjoined twins, diabetics, and late age pregnancies.

## Methods

Currently Nathaniel and others are reviewing and analyzing clinical data collected over the past five years. The researchers are still in early stages of research, but have not seen a significant increase in common risks associated with 15 week and beyond amniocentesis.

The researchers hypothesize that the reason for the improved results is because of the unique technique that the Linda S. Cowan M.D., A.P.C. Clinic uses, which has not been disclosed.

## Research Implications and Future Projects

The benefits of early amniocentesis are far reaching. Early amniocentesis will allow parents to know if their children have genetic disorders earlier on in the pregnancy. With this information, parents can chose to terminate pregnancies or seek guidance to help manage the pregnancy more efficiently, overall leading to more healthy babies and more healthy families.

Nathaniel's mentor Dr. Guberman is also working on an additional research project. The project is also in its early stage. Dr. Guberman and others are applying for Institutional Review Board (IRB) approval to analyze sustainability of a risk reduction program in diabetic pregnant patients, with the goal of analyzing breast-feeding, contraception, and healthy weight gain during pregnancy. This research attempts to determine the sustainability of a new program in diabetes in pregnancy.

Sustainability is an important public health topic today because it does not require constant inputs of capital. Health costs have never been greater, and the government is trying to reduce the amount of money that they have to pay to take care of citizens. The success of this program and people understanding how it works will hopefully lead to the success of other programs, and thus reduce the cost of healthcare overall.

