BIOGRAPHICAL SKETCH

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NAME: Y. Katherine Bianco, MD, FACOG, FACMG

eRA COMMONS USER NAME (credential, e.g., agency login): BIANKATH

POSITION TITLE: Associate Professor, Stanford University

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Santiago of Leon of Caracas High School	BS	1984-89	
"Luis Razetti" School of Medicine, Central University of Venezuela	MD	1990-97	
NIH/ NICHD – Perinatology Research Branch	Postdoc Research Fellow	1998-2000	Perinatology
Yale University School of Medicine	Intern	2000-2001	Ob/Gyn & RS
Yale University School of Medicine	Resident	2001-2004	Ob/Gyn & RS
UCSF Epidemiology and Biostatistics Department	Postdoc course	2004	Training in Clinical Research/ Introduction to Statistical Analysis
UCSF Dept. Radiology in Medicine	Fellow	2004-2005	Ultrasound
UCSF Dept. Ob/Gyn & Reproductive Sciences	Fellow	2004-2008	Maternal-Fetal Medicine
Stanford University/ UCSF Human Genetics	Fellow	2004-2008	Medical Genetics

A. Personal Statement

The goal of the proposed research is to study mechanisms of aneuploid placentation in terms of trophoblast (TB) dysfunction. The strategy is to use transcriptomic and proteomic approaches and a novel model of human placentation—namely, human trophoblast progenitors cells (TBPCs)—to identify targets that play important functional roles. This project is part of my long-term goal of pursuing a career as a physician-scientist, investigating the development of adverse perinatal outcomes in the setting of chromosomal aberrations and/or epigenetic modulations. I am interested in whether the targets we identify can be used to attain an improved understanding of faulty placentation in the presence of aneuploidy with possible implications for the pregnancy complications that are common in these conditions, including recurrent miscarriages and adverse perinatal outcomes. Supported by a K08 award, I derived sets of TBPCs from T13, T18, and T21 placentas and profiled their transcriptomes. In conjunction with the

expertise of the Winn lab, we propose that by examining human variance associated with recurrent pregnancy loss and the functions of the differentially expressed genes, we will uncover mechanisms that are crucial for normal TB function that when awry lead to pregnancy complications. We will uncover mechanisms that are crucial to aneuploid and normal TB functions. My past research experience, in combination with the multidisciplinary team of experts partaken in this fine project, will help us deliver tangible results which expand the knowledge base of human reproductive biology, and can be further translated to improve women's reproductive health care.

B. Positions and Honors

Positions and Employment

1992	Research Assistant, Luis Razetti School of Medicine**.** Pathology Department, Bioexperimental Sciences Institute, Caracas, Venezuela
1996	Principal Student Investigator, Secretary of Health, Government of Venezuela**,** Amazonian Initiative, Orinoco River area, Puerto Ayacucho, Venezuela
2000-04	Leader Facilitator, Centering Pregnancy Program for Minority and Teen Pregnant Population, Yale University School of Medicine, New Haven, CT
2000-01	Internship, Ob/Gyn & Reproductive Sciences, Yale University School of Medicine, New Haven, CT
2001-04	Residency, Ob/Gyn & Reproductive Sciences, Yale University School of Medicine, New Haven, CT
2002	Research Assistant, Biomolecular Resource Center: Susan J Fisher Lab**,** UCSF School of Medicine, San Francisco, CA
2004-06	Postdoctoral Fellow, NIH Perinatal Training Grant, UCSF School of Medicine, San Francisco, CA
2006-08	Postdoctoral Fellow, Institute for Stem Cell and Tissue Biology and Institute for Human Genetics: Renee Reijo-Pera Lab, UCSF/Stanford University School of Medicine, San Francisco, CA
2004-08	Clinical Instructor, Dept. Ob/Gyn & Reproductive Sciences, UCSF School of Medicine, San Francisco, CA
2008-15	Assistant Professor, Dept. Ob/Gyn & Reproductive Sciences, UCSF School of Medicine, San Francisco, CA
2015-now	Associate Professor, Dept. Ob/Gyn, Stanford University School of Medicine, Palo Alto, CA

Other Experience and Professional Memberships

2000-04	Member, Ob/Gyn & Reproductive Sciences Residency Admission Committee, Yale University
2000-04	Member, Ob/Gyn & Reproductive Sciences Residency Curriculum Committee, Yale University
2000-Now	FACOG, American College of Obstetricians and Gynecologist
2003-07	Member, American Institute of Ultrasound in Medicine
2004-Now	Member, Maternal-Fetal Medicine Fellowship Admission Committee, UCSF
2003-Now	Member, Society of Maternal-Fetal Medicine
2005-08	Member, International Society of Stem Cell Research
2005-10	Designed curriculum and achieved accreditation for the combined program UCSF / Stanford University Fellowship in Maternal Fetal Medicine and Medical Genetics
2006-08	Member, Medical Genetics- Fellowship Admission Committee, UCSF School of Medicine
2008-Now	Member, Ob/Gyn & Reproductive Sciences Residency Admission Committee, UCSF School of Medicine
2010	Member, Maternal-Fetal Medicine Perinatal Research Oversight Committee
2011-21	FACMG, American College of Medical Genetics
2012-15	Chair, Diversity Committee, Dept. Ob/Gyn, & Reproductive Sciences, UCSF School of Medicine
2015-now	Dean Office, Office for Faculty Development and Diversity, OBGYN Leader
2017-Now	Director, Maternal Congenital Heart Program, Stanford Health Center/Stanford Children's Health

Awards

1994	"Surgery Internship for Medical Students" Venezuelan Red Cross Organization

1999 “Gran Mariscal of Ayacucho Scholar Foundation Award” Scholar, Venezuela Secretary of Health
2001 “Peter A. Grannum, M.D Memorial Award” Excellence in Teaching, Yale University
2004 “Chief Resident,” Obstetrics and Gynecology Residency Program, Yale University
2004 “Perinatal Medicine Fellowship Award” Scholar NIH/NICHD
2008 “Lysosomal Diseases and Brain Scholar Award” Children’s Gaucher Research Foundation
2008 “Reproductive Science Development Award” NIH/NICHD Scholar
2009 “Outstanding Faculty Award” in Medical Student Teaching, UCSF School of Medicine
2010 “Leadership and Management in Science Scholar”, The David. J. Gladstone Institute
2013 “Outstanding Faculty Award” in Medical Student Teaching, UCSF School of Medicine
2015 “Outstanding Faculty Award” in Medical Student Teaching, UCSF School of Medicine

C. Contributions to Science

My clinical interest in pregnancies complicated with birth defects has led my underlying research interests in genomic abnormalities in the human trophoblast carrying to faulty placentation. The latter began with initial work during K12 and KO8 funding. I took a great interest in the human placenta as it carries potential advantages over other tissues sources: first, this highly metabolically active organ is the potential source of many transcripts. Second, the placenta forms at a very early stage of embryonic development, potentially allowing detection of primary alterations as compared to secondary changes that may mask the underlying causal phenomena. Finally, studying early placentation may provide targets for development of novel molecular approaches, such as up-regulate or down-regulate genes, the protein products of which could potentially serve as molecular surrogates for diagnosis and treatment of pregnancy complication such as miscarriages, pre-eclampsia, pregnancy induced hypertension and intrauterine growth retardation. This work has led to the first Trisomy 21, Trisomy 18, trisomy 13 cell lines established from human placentas making it possible to apply gene editing in the early stages of human trophoblast development.

1. **Bianco K**, Caughey AB, Shaffer BL, Davis G, Norton ME. History of miscarriage and increased incidence of fetal aneuploidy in subsequent pregnancy. Obstet Gynecol.2006.107: 1098-102. PMID: 16648416.
2. Zhou Y, Laroque N, Gormley M, **Bianco K**, McMaster M, Fisher SJ. Culturing cytotrophoblasts reverses gene dysregulation in preeclampsia revealing possible causes. J Clinical Investigation. 2013 Jul 1; 123 (7): 2862-72. PMID: 23934129.
3. Integrative analysis of 111 reference human epigenomes. Roadmap Epigenomics Consortium et al; Nature. 2015 Feb 19; 518(7539):317-30. PMID: 25693563.
4. **Bianco K**, Gormley M, Farrell J, Zhou Y, Oliverio O, Tilden H, McMaster M, Fisher SJ. Placental transcriptomes in the common aneuploidies reveal critical regions on the trisomic chromosomes and genome-wide effects. Prenat Diagn. 2016 Jun 21. PMID: 27328057.
5. Martinez-Leon D, Gormely M, McMaster M, Fisher SJ, **Bianco K**. Trisomy 21 is associated with Caspase-2 upregulation in cytotrophoblasts at the maternal-fetal interface. *In submission.*

As my primary clinical responsibility involves treating patients needing medical care and support through their high risk pregnancies, I am interested in factors that may impact outcomes, such as prenatal screening and diagnosis, maternal heart conditions, labor and delivery management, and safety approaches for the second stage of labor. In investigating length of labor and approaches to shorten the second stage, I have found methods of improving perinatal outcomes in diverse maternal populations.

6. Henry DE, Cheng YW, Shaffer BL, Kamaili AK, **Bianco K**, Caughey, AB. Perinatal Outcomes in the Setting of Active Phase Arrest. Obstet Gynecol. 2008. 112(5): 1109-15. PMID: 18978113.
7. Cheng YW, Shaffer BL, **Bianco, K**, Caughey AB. "Timing of operative vaginal delivery and associated perinatal outcomes in nulliparous women". J Matern Fetal Neonatal Med. 2011. 24(5): 692-7. PMID: 21401312.
8. Ye L, Valderramos S, Pena S, Cheng YW, **Bianco K**. Perinatal outcomes in euploid pregnancies with "double-positive" first trimester prenatal screening for trisomy 18 and 21. J Perinatology. 2013 Nov; 33 (11): 836-40. PMID: 23887195.

9. Henry D, Harris IS, Bosco V, Killion M, Thiet MP, **Bianco K.** Maternal Arrhythmia and Perinatal outcomes: A Pregnancy and Cardiac Disease Treatment (PACT) program. J Perinatol. 2016 Jun 16. PMID: 27309629.

With regards to my interest in fetal medicine, I have worked in collaboration with other specialists such as radiologists and pediatric cardiologists utilizing imagining studies to assess and determine successful perinatal care and fetal survival.

10. **Bianco K**, Small M, Julien S, Copel JA. Second trimester Ductus Venosus measurement and adverse perinatal outcome in fetuses with Congenital Heart Disease. J Ultrasound Med.2006. 25: 9 79-82. PMID: 16870891.
11. Orit G**, Bianco K,** Barkovich AJ, Callan PW, Parer JT**.** Fetal Cerebellar Hemorrhage in Parvovirus-Associated Non-Immune Hydrops. Journal of Maternal-Fetal & Neonatal Medicine. 2009:769-72. PMID: 17763280.
12. Arunamata A, Axelrod DM, **Bianco K**, Balasubramanian S, Quirin A, Tacy TA. Chronic antepartum maternal hyperoxygenation in a case of severe fetal Ebstein's anomaly with circular shunt physiology. Ann Pediatr Cardiol. 2017 Sep-Dec;10(3):284-287. PMID: 28928616.

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

1. SeraCare Life Sciences Precision Medicine (co-PI) 03/01/2017- 03/30/2019

Completed Research Support

1. **NIH/NICHD (K08 HD069518-01**) (PI): Katherine Bianco, MD.
09/2011-09/2014.
The goals of the proposed research were to establish TBPC lines from T13, T18 and T21 placentas and to study their functions (e.g., stage-specific antigen expression) in terms of self-renewal and differentiation, cytotrophoblast invasion and syncytiotrophoblast fusion.

2. NIH/NICHD Reproductive Sciences Development Career Program. (K12HD-000849) March of Dimes/ NICHD/NIH Development Award.
07/2008-06/2011.
(PI): Katherine Bianco; Mentor: Susan Fisher, PhD
The objective of this research was defining candidate genes for the development of biochemical markers diagnostic of aneuploidy in the maternal blood stream and identifying candidate genes whose misexpression is critical to either human placentation and/or fetal development.
Role: Principal investigator

3. **NIH Perinatal Training Grant** (T32 HD-07162) in Perinatal Medicine
(PI): Joseph Kitterman, MD, Julian T Parer, MD, PhD. University of California at San Francisco
07/2004-06/2006
The objective was to provide comprehensive training in perinatal science and mentored career development for obstetricians with MD or MD,PhD degrees and who are committed to an academic career with a strong research component. The program provides advanced research training for clinicans in basic laboratory science, clinical investigation or studies in epidemiology, health services or health policy related to maternal, fetal and neonatal illnesses.
Role: Post-doctoral Fellow

4. **NIH/ NICHD – Perinatology Research Branch.**
(PI): Roberto Romero, MD
07/1998 - 06/2000

The objective of this work was to examine markers of inflammation at the maternal-fetal interface of pregnancies complicated by premature labor, premature rupture of membranes and pre-eclampsia. Role: NIH Intramural Postdoctoral Fellow.