

CURRICULUM VITAE

Julie Anne Sanford Biggerstaff, PhD

EDUCATION

BA, Molecular, Cellular and Developmental Biology, Univ. of Colorado
Boulder, Colorado, 1981

MS, Human Genetics, University of Texas, Grad. School of Biomedical Sciences
Houston, Texas, 1983

PhD, Human Genetics, University of Texas, Grad. School of Biomedical Sciences
Houston, Texas 1987

POSTGRADUATE TRAINING

Predoctoral Fellow

American Legion Auxiliary, University of Texas, GSBS, M.D. Anderson Cancer Center., Dept. of
Cell Biology, Houston, Texas, 1983-1987

Postdoctoral Fellow

Laboratory for Genetic Services, Baylor College of Medicine
Houston, Texas, 1988

Research Postdoctoral Fellow

Department of Pediatrics, Division of Medical Genetics, Univ. of Texas Medical School
Houston, Texas, 1988-1990

PROFESSIONAL APPOINTMENTS

Director, Cytogenetics

Hematologics, Inc.

Seattle, WA

March 2009 - present

Technical Director

Providence Associates Medical Laboratory

Spokane, WA

December 2007- present

Consultant Director

Signature Genomic Laboratories, LLC

Spokane, WA

January- December 2008

Director, Cytogenetics

Idaho Cytogenetics Diagnostic Laboratory

Boise, Idaho

July, 2002-present

Director, Cytogenetics

Sacred Heart Medical Center

Spokane, Washington

September, 1997-September, 2007

Director, Cytogenetics
Genzyme Genetics
1993 - July, 1997

Adjunct Faculty
Houston Community College
Houston, Texas, 1990

Clinical Scientist
Division of Cytogenetics
Duncan Guthrie Institute of Medical Genetics Glasgow University
Glasgow, Scotland, 1992

CERTIFICATION

American Board of Medical Genetics
Clinical Cytogenetics - 1990

MEMBERSHIPS

American Society of Human Genetics
American College of Medical Genetics – Fellow
American Board of Medical Genetics
American Cytogenetic Conference Group

PROFESSION-RELATED ACTIVITIES

Genetic Advisory Committee, Division Maternal and Child Health, State of Washington,
1998 to the present
 President of the committee, 2001 to 2004
Chairperson, March of Dimes Program Services, Inland Northwest Division, 1998 to 2005
Member, Genetics Task Force, Dept. of Health, State of WA, 2002
Ethics and Moral Perspectives Committee Member, Sacred Heart Medical Center
2004 to 2007

PUBLICATIONS

ARTICLES - REFERRED JOURNALS

Teeter LD, **Sanford JA**, Sen S, Stallings RL, Siciliano MJ, Kuo MT: "Multidrug Resistant Phenotype Co-Segregates with an Amplified Gene in Somatic Cell Hybrids of Drug Resistant CHO and Sensitive Murine Cells", "Molec and Cell Biol", 6:4268, 1986.

Sanford JA and Stubblefield E: "General Protocol for Microcell-Mediated Chromosome Transfer", "Somatic Cell and Molec Genet", 13:279, 1987.

Stubblefield E and **Sanford JA**: "A General Survey of Genetics and Cancer", "Anticancer Research", 7:1085, 1987.

Sanford JA and Stubblefield E: "Human Oncogenes in Mouse/Human Microcell Hybrids", "Oncogene Res", 4:195, 1989.

Aulthouse AL, Beck M, Griffey E, **Sanford J**, Arden K, Machado MA, Horton WA: "Expression of the Human Chondrocyte Phenotype in Vitro", (In Vitro) "Cell and Dev Biol", 25:659, 1989.

Yang F, Friedrichs WE, Cupples RL, Bonifacio MJ, **Sanford JA**, Horton WA, Bowman BH: "Human Ceruloplasmin: Tissue-Specific Expression of Transcripts Produced by Alternative Splicing." "J Biol Chem" 266(18):10780, 1990.

Hanna JS, RL Neu and JR Barton: "Difficulties in Prenatal Detection of Mosaic Trisomy 8." Prenatal Diagnosis, 15(12):1196-1197, 1995.

Pardo Julio M and **Julie Sanford Hanna**: "Balanced X-autosome Translocation in a Girl with Short Stature and Ovarian Dysfunction: Response to One Year of Growth Hormone Treatment." Int'l J Ped, 11(1), 1996.

Sanford Hanna J, Richard L Neu and David H Lockwood: "Prenatal Cytogenetic Results from Cases Referred for 44 Different Types of Abnormal Ultrasound Findings." Prenatal Diagnosis, 16:109, 1996.

Heuther Carl A, Rebecca Martin, Susan Stoppleman, Sharon D'Szoua, Jennifer Bishop, Claudine Torfs, Fred Lorey, Kristin May, **Julie Sanford Hanna**, Patricia Baird and JoAnn Kelly. "Sex Ratios in Fetal and Livebirth Autosomal Aneuploids." J Med Genetics, 63:492, 1996.

Sanford Hanna J, Shires P, Matile G.: "Trisomy 1 in a Clinically Recognized Human Pregnancy." Am J Med Genetics, 68(1):98, 1997.

Estabrooks, L.L., **J. Sanford Hanna**, A.N. Lamb: "Overwhelming Maternal Cell Contamination in Amniotic Samples from Patients with Oligohydramnios Can Lead to a False Positive Interphase FISH Results." Prenatal Diagnosis, 19:178, 1999.

Sanford-Hanna, Julie A, Ball, S., Pagan, R.A., Donlan, M: "Mother to son transmission of del(1)(q42.1q42.3)." Am. J. Med. Genetics, 98:103, 2001.

DeTar, Mike, **Sanford Biggerstaff, J.**, "Congenital Renal Rhabdoid Tumor with Placental Metastases: Immunohistochemistry, Cytogenetic, and Ultrastructural Findings", Pediatric and Developmental Pathology, 9(2):161, 2006.

DeTar, Mike, **Sanford Biggerstaff, J.**, "Congenital Trisomy 21 associated Myeloproliferative Disease: Diagnostic Placental Pathology with Confirmation by FISH (fluorescent in situ hybridization)" in preparation.

Sanford Biggerstaff, J., Liu, W., Slovak, M.L., Bobadilla, D., Bryant, E., Glotzbach, C., and Shaffer, L. G. "A dual color FISH assay distinguishes between ELL and MLLT1 (ENL) gene rearrangements in t(11;19) positive acute leukemia", Leukemia, 20:2046, 2006.

Mikhail, F. M., Sathienkikhanchai, A., Robin, N.H., Prucka, S., **Sanford Biggerstaff, J.**, Komorowski, J., Andersson, R., Bruder, C.E.G., Piotrowski, A., Dian de Stahl, T., Dumanski, J.P. Carroll, A.J. "Overlapping phenotype of Wolf-Hirschhorn and Beckwith-Wiedemann Syndromes in a girl with der(4)t(4;11)(pter;pter)", Am. J. Medical Genetics, Aug 1;143(15):1760-6, 2007

Tsuchiya, K.D., Shaffer, L.G., Aradhya, S., **Sanford Biggerstaff, J.**, Gastier-Foster, J., Patel, A., Rudd, M.K., Sanger, W., Schwartz, S., Tepperberg, J., Thorland, E., Torchia, B., Brothman, A.R. "Variability in Interpreting and reporting copy number changes detected by array-based technology in Clinical Laboratories" Genetics in Medicine, Nov. 2009.

Wells, D.A., Jevon, A.C., deBaca, M.D., Kalnosky, M.H., Eidenschink, L., Ghirardelli, K.M., Zehentner, B.K., **Sanford Biggerstaff, J.**, Loken, M.R., "Flow cytometric scoring system strongly correlates phenotype with genotype in patients with unexplained cytopenias" . Submitted, Leukemia Research, November , 2009.

ARTICLES - NON-REFERRED JOURNALS

Sanford Hanna, Julie: "Analysis of Products of Conception: Cytogenetic and Laboratory Perspectives." The Genetic Viewpoint, 3(1):3, 1996

Sanford Hanna, Julie: Genetics related topic articles for "Scope", the Sacred Heart Medical Center Physician newsletter, published bi-monthly, 1997 to 2006.

ABSTRACTS

Sanford JA and Stubblefield E: "Microcell-Medicated Chromosome Transfer Using a Human Lymphoblast Cell Line as the Chromosome Donor." AM J Hum Genet, 35(6):151A, 1983.

Sanford JA and Stubblefield E: "Comparison of Microcell Mediated Chromosome Transfer and DNA Transfection for Detecting Transforming Genes on Chromosomes of Human Tumor Cell Lines." AM J Hum Genet, 39(3):41A, 1986.

Ellard JT, Machado MA, **Sanford JA**, Putnam EA, Campbell DF, Horton WA: "Comparative Studies of In Vivo and In Vitro Human Chondrocytes." Texas Soc. for Electron Microscopy, Austin, TX, March, 1989.

Horton WA, **Sanford JA**, Ellard J: "Expression of the Cartilage Matrix Fibril Dysplasia (CMFD) Chondrodysplasia Phenotype in Vitro." David Smith Meeting, Madrid, Spain, March 1989.

Sanford JA, Ellard J and Horton WA: "Type II Collagen Abnormalities in a Bovine Model of a Chondrogenesis Type II (Langer-Saldino)." Am J Hum Genetics, 49(4):239A, 1989.

Sanford Hanna J and Lockwood D: "A Retrospective Study of Risks for Chromosome Abnormality with Hydrops and Associated Anomalies." Am J Hum Genet, 53(3):598, 1993.

Benn P, Craffey A, Ciarleglio L, Lamb A, **Sanford Hanna J**, Krasikov N: "Maternal Serum Triple Screening for Down Syndrome (DS) may also preferentially Identify some Fetuses with Supernumerary "Marker" Chromosomes (SMCs)." Am J Hum Genet, 53(3):1382A, 1993.

Murphy RA, **J. Sanford Hanna** and P Bayliss: "Prenatal detection of a unique case with unbalanced mosaic cell lines." Applied Cytogenetics, 20(3):89, 1994.

Neu RL, **Sanford Hanna J** and Lockwood D: "Cytogenetic Laboratory Experience with 2,378 Early Amniotic Fluid and 3669 Chorionic Villi Specimens." 7th International Conference on Early Prenatal Diagnosis, Israel, May 1994.

Hanna JS, BA Allitto, M St Amant, FH Coleman and AN Lamb: "Prenatal diagnosis of satellited Yp: Clinical significance and report of two cases." Second Joint Clinical Genetics Meeting - 26th Annual March of Dimes Clinical Genetics Conference and American College of Medical Genetics Second Annual Meeting, March 6-9, 1995, Los Angeles, CA.

Sanford Hanna J, PM Shires and G Matile: "Trisomy 1 in a spontaneous pregnancy loss at 9 weeks gestation." Second Joint Clinical Genetics Meeting - 26th Annual March of Dimes Clinical Genetics Conference and American College of Medical Genetics Second Annual Meeting, March 6-9, 1995, Los Angeles, CA.

Elliott CM and **JS Hanna**: "Fetal Demise Specimens: Failure and abnormality rates of amniotic fluid specimens and products of conception over a seven year period." Applied Cytogenetics, 21(3):110, 1995.

Schaefer NM, JA Higgins and **JS Hanna**: "Maternal inheritance of a pericentric inversion of chromosome 11 resulting in Beckwith-Wiedemann syndrome." Applied Cytogenetics, 21(3):89, 1995.

Medina MJ, RA Murphy and **J Sanford Hanna**: "Prenatal Diagnosis of Prader-Willi/Angelman syndrome with a de novo t(15;17)." Applied Cytogenetics, 21(3):88, 1995.

Sanford Hanna J, L Estabrooks, K Hire, J Sandow and S Roaf: "De novo complex chromosome rearrangements in a products of conception specimen." Am J Hum Genetics, 57(4):A125, 1995.

Schaefer N, S Mundt, D Lieberman, P Fairbrother and **J Sanford Hanna**: "Prenatal diagnosis of 11p15.3 rearrangements: laboratory experience and a report of three cases." Am J Hum Genetics, 57(4):A288, 1995.

Lamb AN, M Pettenati, **J Sanford Hanna**, N Krasikov, R Neu, N Rao, M Weinstein, J Weiser and L Estabrooks: "Six

cases of satellited long arm of chromosome 2 detected during prenatal chromosome diagnosis." Am J Hum Genetics, 57(4):A282, 1995.

Olney PN, J Korotkin, **J Sanford Hanna**, A Lamb, BA Allitto, R Hirsch and K Kupke: "Prenatal diagnosis of a 46,XX male with the SRY probe and FISH." Am J Hum Genetics, 57(4):A286, 1995.

Clark BA, A Foster, CA Crowe, GG Ashmead, J Steward, JJ Weiser and **J Sanford Hanna**: "Triple mosaic aneuploidy at amniocentesis and phenotypically normal pregnancy outcome." Am J Hum Genetics, 57(4):A277, 1995.

Priest JH, WR Adams, **J Sanford Hanna**, HH Hobart, DF Saxe, T Sanders, L McGavran, AA Perszyk, EB Spector and JF Stone: "The nature of recurrent triploidy in humans." Am J Hum Genetics, 57(4):A123, 1995.

Mulla WR, R Kline, A Genin, DAH Whiteman, MD Jones, EB Rand, **J Sanford Hanna** and NB Spinner: "Chromosome 20 Deletions: molecular cytogenetic analysis and correlation with phenotype." Am J Hum Genetics, 57(4):A121, 1995.

Estabrooks, LL, CH Lytle, M Sapeta, J Sandow, J Takacs, **J Sanford Hanna**, R Neu, J Weiser, B Ward, K Rao, A Lamb: "Partial Aneuploidy detected by Prenatal Interphase FISH Analysis." Am J Hum Genetics, 59(4):A2090, 1996.

Sanford Hanna, J., K. Waters, and W. Busch. "Prenatally Detected Interstitial Deletion 6q and Clinical Outcome." 28th Annual March of Dimes Clinical Genetics Conference and ACMG 4th Annual Meeting, February, 1997, FT. Lauderdale, FL.

Sanford Hanna, J., K. Dasse, D. Eller, P. Rogers and G. Webb. "Prenatal Diagnosis of Mosaic De novo Trisomy 1q." 28th Annual March of Dimes Clinical Genetics Conference and ACMG 4th Annual Meeting, February, 1997, Ft. Lauderdale, FL.

Takacs, J., M. Kaemper, J. Weiser, and **J. Sanford Hanna**. "Mosaic Deletion 9q31: True Mosaicism or an Extreme Case of Fragile Site Expression". Assoc. Genetic Technologists Meeting, June, 1997. Applied Cytogenetics, 1997.

George L, **Sanford Hanna J**, Shaffer LG, and N Asterbadi: "A Prenatal Example of Extreme Pseudomosaicism?" AJHG, 61 (4): A874, 1997.

Sanford Hanna J, J Takacs, JJ Weiser, MK Runde, S Mundt: "Frustrating Fragile Sites: Mosaic Deletions in Prenatal Studies." AJHG, 61(4): A926, 1997.

Sanford Hanna, J., Gaskin, S., and Martin, J: "Detection of Tissue-limited Mosaicism: A Case report of Mosaic Trisomy 12" American Cytogenetics Conference, Santa Fe, NM, April, 2002.

Patternson, Lynda, Timm, Nadine, Holquin, Rafael, **Hanna, J.S.**, "The Importance of Routine Chromosome Analysis screening in Infertility Clinic Patients" Association of Genetic Technologists meeting, Spring, 2003.

Holquin, Ralf, **Sanford Hanna, J.**, "Issues with FISH probe Validation" American Cytogenetics Conference meeting, Stevenson, WA, April 2004.

Sanford Biggerstaff, J., Liu, W., Glotzbach, C., Shaffer, L.G., "Development and Clinical Validation of a "Home-Brew" Dual-Color FISH probe assay to differentiate between ELL and ENL gene rearrangement in Leukemia". American Society of Hematology Meeting, Atlanta, GA, December, 2005.

Sathienkijkanchai¹, N.H. Robin¹, S. Prucka¹, **J.S. Biggerstaff⁴**, J. Komorowski³, R. Andersson³, C. Bruder^{1,2}, A. Piotrowski^{1,2}, T. Diaz de Stahl², J.P. Dumanski^{1,2}, A.J. Carroll¹, F.M. Mikhail¹." "Combined phenotype of Wolf-Hirschhorn and Beckwith-Wiedemann Syndromes in a female with der(4)t(4;11)(pter;pter)" ASHG, October 2006.

Johnson, E.V., Huber, S., Liu, W., **Sanford Biggerstaff, J.**, Laffin, J., Raca, G., Dyer Montgomery, K., "Two different t(11;19)-Subtle cytogenetic variation with marked clinical differences". Assoc. Genetic Technologist meeting, Denver, June, 2007.

Sol-Church, K., Stably, D.L., Conard, K., Nicholson, L, **Sanford Biggerstaff, J.**, Liu, W., Campbell, J.B., Meyer,

W.H., Gripp, K.W. "LOH of maternal alleles on chromosome 11 is associated with aggressive ERMS in two patients with Costello Syndrome" Am. Society of Human Genetics meeting, San Diego, CA October 2007.