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BIOGRAPHICAL SKETCH

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NAME: Bloss, Cinnamon Sue

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

POSITION TITLE: Assistant Professor

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
Smith College	B.A.	05/1997	Psychology
University of Florida	Internship	06/2007	Clinical Psychology/ Neuropsychology
University of California, San Diego (Joint Doctoral Program)	Ph.D.	06/2007	Clinical Psychology
The Scripps Research Institute	Postdoctoral	06/2008	Statistical Genetics/ Genomic Medicine
Medical College of Wisconsin	M.S.	Expected 2016	Bioethics

A. Personal Statement

I am an Assistant Professor in the Departments of Psychiatry (primary) and Family Medicine and Public Health (secondary) at the University of California, San Diego. I hold a joint appointment as a Policy Analyst at the J. Craig Venter Institute, and I am a licensed clinical psychologist. My background is in clinical psychology, neuropsychology, statistical genetics, genomic medicine, biomedical ethics, and health policy, and I have had extensive training in psychometric scale development and validation. I have conducted both candidate gene and genome-wide association studies of neurocognitive phenotypes, as well as empirical work on biomedical ethics topics in the area of genetic testing, genome sequencing, and wireless sensors. Prior to joining UCSD, I was Director of Social Sciences and Bioethics at the Scripps Translational Science Institute, where I was a member of the Scripps Clinical and Translational Science Award Executive Committee. At Scripps, I led the design and implementation of three complex, internally- or CTSA-funded, large scale projects (Scripps Genomic Medicine Initiative, Scripps Idiopathic Diseases of Man Study, and Scripps Wired for Health Study). All three projects involved management of multiple research personnel, clinical collaborators, and industry partners, as well as development and deployment of online surveys and assessment batteries. I have previously been the PI of a NIH/NHGRI R21 grant to study consumer psychological and behavioral response to direct-to-consumer genomic testing. From this work, I published a seminal article in the *New England Journal of Medicine* and presented invited testimony based on the findings before a Food and Drug Administration Advisory Panel to inform consumer genomics policy. I have been a Co-Investigator on several previously funded NIH grants and have published over 50 papers since earning my doctorate 7 years ago. I have mentored over 20 students ranging in training level from high school to post-doctoral fellow. My current research focuses on the individual and societal impacts of emerging biomedical technologies.

1. **Bloss, C.S.**, Schork, N.J., & Topol, E.J. (2011). Effect of direct-to-consumer genomewide profiling to assess disease risk. New England Journal of Medicine, 364(6), 524-534.
2. **Bloss, C.S.** (2013). Does family always matter? Public genomes and their effect on relatives. Genome Medicine. 55(12), 107.
3. **Bloss, C.S.**, Ornowski, L., Silver, E., Cargill, M., Vanier, V., Schork, N.J., & Topol, E.J. (2010). Consumer perceptions of direct-to-consumer personalized genomic risk assessments. Genetics in Medicine, 12(9), 556-566.

4. Akshoomoff, N., Newman, E., Thompson, W.K., **Bloss, C.S.**, McCabe, C., Chang, L., Amaral, D.G., Casey, B.J., Ernst, T.M., Frazier, J.A., Gruen, J.R., Kaufmann, W.E., Kenet, T., Kennedy, D.N., Libiger, O., Mostofsky, S., Murray, S., Sowell, E.R., Schork, N., Dale, A.M., & Jernigan, T.L. for the Pediatric Imaging, Neurocognition, and Genetics Study. (2014). The NIH toolbox cognition battery: Results from a large normative developmental sample (PING). Neuropsychology. 28(1), 1-10.

B. Positions and Honors

Positions and Employment

1997-1999 Research Assistant, Stanford/VA Alzheimer's Center, Stanford University
1999-2000 Research Analyst, Physiological and Structural Brain Imaging Laboratory, SRI International
2000-2001 Research Intern, Division of Molecular Medicine, City of Hope National Medical Center
2001-2004 Research Associate, Laboratory for Research on the Neuroscience of Autism, Children's Hospital San Diego
2004-2007 Graduate Student Researcher, Department of Psychiatry, VA San Diego and UCSD
2004-2006 Lecturer, Department of Psychology, San Diego State University
2006-2007 Clinical Intern, Department of Clinical and Health Psychology, University of Florida
2007-2008 Postdoctoral Fellow, Department of Molecular and Experimental Medicine, The Scripps Research Institute
2008-2010 Research Scientist, Scripps Translational Science Institute, Scripps Genomic Medicine, and Scripps Health
2008-2014 Founder and Director, Scripps Translational Science Institute Summer Undergraduate Research Internship
2010-2014 Assistant Professor, Scripps Translational Science Institute
2010-2014 Assistant Faculty-Research, Scripps Genomic Medicine, Scripps Health
2011-2014 Lecturer, Graduate Program, The Scripps Research Institute
2012-2014 Director, Social Sciences & Bioethics, Scripps Translational Science Institute
2012-2014 Assistant Adjunct Professor (nonsalaried), Department of Psychiatry, University of California, San Diego
2014-2015 Manager and Senior Professional, The Qualcomm Institute/Calit2, University of California, San Diego
2014-present Health Policy Analyst, J. Craig Venter Institute
2014-present Faculty Member, Center for Wireless and Population Health Systems, The Qualcomm Institute/Calit2, University of California, San Diego
2015-present Assistant Professor, Departments of Psychiatry (primary) and Family Medicine and Public Health (secondary), University of California, San Diego

Other Experience and Professional Memberships

2006-present Member, American Psychological Association
2006-present Member, International Neuropsychological Society
2009-present Member, American Society of Human Genetics
2009-present Licensed Psychologist, State of California (No. PSY 23085)
2013-present Member, American Society for Bioethics and Humanities

Honors

11/2012 "Special Mention", Children's Leadership Award for the Reliable Interpretation and appropriate Transmission of Your genomic information ("CLARITY" Challenge), Team Member, Scripps Genomic Medicine, Scripps Translational Science Institute
2009 Selected Attendee &Travel Grant Recipient, UCLA Consortium for Neuropsychiatric Phenomics, Symposium on Translational Phenomics in the GWAS Era
2008 Selected Trainee, National Institute on Drug Abuse (NIDA) Short Course on the Genetics and Epigenetics of Addiction
2006 APA Grant Recipient (Student Research Award), First Place, Section IV (Division 12)
2005 Outstanding Doctoral Student Teaching Award, Department of Psychology, San Diego State University
1993-1997 Dean's List, Smith College

C. Contribution to Science

1. A major proportion of my recent work has focused on the psychological and behavioral impacts of direct-to-consumer genomic testing. I conducted the first study of this with individuals who actually underwent testing. In brief, direct-to-consumer genomic testing companies emerged in 2007 and generated a great deal of controversy among scientists and policy experts. Major issues cited were the potential for harms to consumers and the health care system from the provision of genomic risk information to individuals without involvement of health provider intermediary. My work has suggested that there are few adverse or beneficial effects on consumers of undergoing this type of testing. From this work, I published a seminal article in the *New England Journal of Medicine* (listed in the section above) and presented invited testimony based on the findings before a Food and Drug Administration Advisory Panel to inform consumer genomics policy. My role encompassed all aspects of this work, including the study conception, design, execution (including oversight and management of both research personnel and industry collaborators), data analysis, and manuscript preparation.

    a. **Bloss, C.S.**, Topol, E.J., & Schork, N.J. (2012). Association of direct-to-consumer genome-wide risk estimates and self-reported disease. Genetic Epidemiology, 36, 66-70.
    b. Darst, B.F., Madlensky, L., Schork, N.J., Topol, E.J., & **Bloss, C.S***. (2013). Perceptions of genetic counseling services in direct-to-consumer personal genomic testing. Clinical Genetics doi: 10.1111/cge.12166.
    c. **Bloss, C.S.***, Wineinger, N.E., Darst, B.F., Schork, N.J., & Topol, E.J. (2013). Impact of direct-to-consumer genomic testing at long term follow-up. Journal of Medical Genetics, 50(6), 393-400.
    d. Boeldt, D.L., Schork, N.J., Topol, E.J., & **Bloss, C.S.** * (2014). Influence of individual differences in disease perception on consumer response to direct-to-consumer genomic testing. Clinical Genetics.

2. As a post-doctoral fellow in statistical genetics, I conducted high dimensional genetic association studies, including genome-wide association and genome sequencing studies with a range of neurophenotypes. These included eating disorders, bipolar disorder, schizophrenia, and others. I developed and applied novel genetic analysis methodologies, including incorporation of genetic ancestry estimates and gene x environment interaction terms into statistical models.

    a. **Bloss, C.S.**, Berrettini, W., Bergen, A., Magistretti, P., Duvvuri, V., Strober, M., Brandt, H., Crawford, S., Crow, S., Fichter, M.M., Halmi, K.A., Johnson, C., Kaplan, A.S., Keel, P., Klump, K.L., Mitchell, J., Treasure, J., Woodside, D.B., Marzola, E., Schork, N.J., & Kaye, W.H. (2011). Genetic association of recovery from eating disorders: The role of GABA receptor SNPs. Neuropsychopharmacology, 36(11), 2222-32.
    b. **Bloss, C.S.**, Schiabor, K.M., & Schork, N.J. (2010). Human behavioral informatics in genetic studies of neuropsychiatric disease: Multivariate profile-based analysis. Brain Research Bulletin, 83(3-4), 177-178.
    c. Bakken, T.E., **Bloss, C.S.**, Roddey, C.J., Joyner, A.H., Rimol, L.M., Djurovic, S., Melle, I., Sundet, K., Agartz, I., Andreassen, O.A., Dale, A.M., & Schork, N.J. (2011). Association of genetic variants on 15q12 with cortical thickness and cognition in schizophrenia. Archives of General Psychiatry, 68(8), 781-90.
    d. Smith, E.N.,* **Bloss, C.S.**,* Badner, J.A., Barrett, T., Belmonte, P.L., Berrettini, W., Byerley, W., Coryell, W., Craig, D., Edenberg, H.J., Eskin, E., Foroud, T., Gershon, E., Greenwood, T.A., Hipolito, M., Koller, D.L., Lawson, W.B., Liu, C., Lohoff, F., McInnis, M.G., McMahon, F.J., Mirel, D.B., Murray, S.S., Nievergelt, C., Nurnberger, J., Nwulia, E.A., Paschall, J., Potash, J.B., Rice, J., Schulze, T.G., Scheftner, W., Panganiban, C., Zaitlen, N., Zandi, P.P., Zöllner, S., Schork, N.J., & Kelsoe, J.R. (2009). Genome-wide association study of bipolar disorder in European American and African American individuals. Molecular Psychiatry, 14(8), 755-763.
    *Shared first authorship.

3. As part of my dissertation work, I conducted one of the first studies of the relationship between the APOE-e4 genetic risk factor for Alzheimer's disease and cognitive functioning in typically developing children. Prior to my study, virtually all research on APOE-e4 and cognitive functioning had been limited to studies of adults. My work found that on average, children with the e4 variant outperformed noncarriers on some

cognitive tests. This work was among the first to put forth the notion that the APOE-e4 variant has antagonistic pleiotropic effects, that is, different phenotypic effects at different ages and developmental stages. These findings have prompted a body of follow-on work investigating this hypothesis. My role encompassed all aspects of this work, including the study conception, design, execution (including recruitment of nearly 200 children and adolescents through a local group of charter schools), data analysis, and manuscript preparation.

a. **Bloss, C.S.**, Delis, D.C., Salmon, D.P., & Bondi, M.W. (2008). Decreased cognition in children with risk factors for Alzheimer's disease. Biological Psychiatry, 64(10), 904-906.
b. **Bloss, C.S.**, Delis, D.C., Salmon, D.P., & Bondi, M.W. (2010). APOE genotype is associated with left-handedness and visuospatial skills in school-aged children. Neurobiology of Aging, 31, 787-795.
c. Morgan, E.E., Woods, S.P., Letendre, S.L., Franklin, D.R., **Bloss, C.**, Goate, A., Heaton, R.K., Collier, A.C., Marra, C.M., Gelman, B.B., McArthur, J.C., Morgello, S., Simpson, D.M., McCutchan, J.A., Ellis, R.J., Abramson, I., Gamst, A., Fennema-Notestine, C., Smith, D.M., Grant, I., Vaida, F., & Clifford, D.B. CNS HIV Antiretroviral Therapy Effects Research (CHARTER) Group. (2013). Apolipoprotein E4 genotype does not increase risk of HIV-associated neurocognitive disorders. Journal of Neurovirology, 19(2), 150-6.

4. Early in my graduate school training, I conducted one of the first studies of (neuroanatomy in young girls with autism. Prior to my study, most papers in this area had focused on neuroanatomy in boys with autism, in large part due to the preponderance of boys with the disorder (a 4:1 male:female ratio). My work suggested that while girls with autism have the same profile of neuroanatomical differences from typically developing girls as do boys with autism versus typical boys, the differences in girls are more pronounced.

a. **Bloss, C.S.**, & Courchesne, E. (2007). MRI neuroanatomy in young girls with autism: A preliminary study. Journal of the American Academy of Child and Adolescent Psychiatry, 46, 515-523.
b. Schumann, C.M., **Bloss, C.S.**, Carter Barnes, C., Wideman, G.M., Carper, R.A., Akshoomoff, N., Pierce, K., Hagler, D., Schork, N., Lord, C., & Courchesne, E. (2010). Longitudinal magnetic resonance imaging study of cortical development through early childhood in autism. Journal of Neuroscience, 30(12), 4419-27.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1hMqF5OZ5YkAk/bibliography/47386305/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

Robert Wood Johnson Foundation (71693) Patrick (PI) 06/01/2014-01/31/2017
Health Data Exploration Project
This research aims to accelerate the use of personal health data derived from wearable sensors and smartphone apps in health research through studies and activities designed to explore and understand the methodological and infrastructural barriers.
Role: Co-Investigator

Legler Benbough Foundation Friedman (PI) 10/1/2014-06/1/2015
San Diego Network on Policy and Societal Implications of 21st Century Biomedical Advances
The aim of this project is to organize and catalyze a San Diego-based forum for examining the societal and policy implications of cutting-edge biomedical research.
Role: Co-Investigator

CTRI Pilot Grant, University of California, San Diego Laurent (PI) 4/1/2014-3/31/2015
Whole Exome Sequencing for Prenatal Diagnosis
This project evaluates the use of exome sequencing for prenatal diagnosis of fetal abnormalities identified on ultrasound, including patient preferences and behavioral and psychological response to return of results.
Role: Co-Investigator

1R01 DA035736-01 Cherner (PI) 4/1/2013-3/31/2016
CYP2D6 Genotype & Cognitive Deficits in Methamphetamine Users with/without HIV
This research aims to understand whether CYP2D6 variants contribute to brain dysfunction associated with methamphetamine use.
Role: Sub-contract PI & Co-Investigator

Completed Research Support

R21 HG HG005747-01 Bloss (PI) 4/01/2010-3/31/2012
Response to testing among individual consumers of DTC personal genomics services
The goal of this project is to characterize consumers of direct-to-consumer personal genomics services and assess their behavioral and psychological response to DTC genetic testing.
Role: PI

1UL1 TR001114-01 Topol (PI) 9/26/2013-4/30/2014
Scripps Translational Science Institute CTSA Award
This research aims to catalyze changes in biomedicine through innovative infrastructure building and strategic projects focused on genomics, wireless and digital medicine, and bioinformatics.
Role: Co-Investigator

Discovery-Innovation Grant - Sanofi-Aventis Bloss (PI) 9/30/2011-9/29/12
Alzheimer's Disease Susceptibility Signatures in the Youngest-Young
The goal of this project is to evaluate the early life neurobiological correlates of Alzheimer's disease genetic risk in a large pediatric cohort.
Role: PI

RC2 DA029475-01 Jernigan (PI) 9/30/2009-9/29/2011
Creating a pediatric imaging-genetics data resource (no cost extension, 9/30/2011-9/29/2013)
The goals of this study are to create a pediatric imaging-genomics resource, as well as identify common genetic variation associated with neural architectural and neurocognitive phenotypes in the developing human brain.
Role: Co-Investigator

Klarman Foundation Award Berrettini (PI) 8/01/2008-7/31/2010
Genetics of anorexia nervosa
The goal of this study is to identify genetic susceptibility variants that may contribute to anorexia nervosa and other eating disorders through genome-wide association and candidate gene resequencing.
Role: Co-Investigator

Clinical Research Development Award, Scripps Health Bloss (PI) 7/01/2008-6/30/2009
Gene expression profiling to develop blood-based biomarkers of Parkinson's disease dementia
This goal of this project was to identify blood-based transcriptomic biomarkers of cognitive decline and dementia in Parkinson's disease.
Role: PI