BIOGRAPHICAL SKETCH

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NAME: Baker, Dewleen G.

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POSITION TITLE: Professor, Department of Psychiatry, University of California San Diego and Director of Research, VA Center of Excellence for Stress and Mental Health

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
Stanford University Palo Alto, CA	B.A.	1968	Psychology
Columbia University College of Physicians and Surgeons New York, NY	M.D.	1981	Medicine

A. Personal Statement

I am a Clinician and Research Scientist at VA San Diego Healthcare System (VASDHS), Director of Neuroscience Research, VA Center of Excellence for Stress and Mental Health and a Professor, Department of Psychiatry, University of California San Diego. My previous experience includes over two decades of clinical, teaching and research in PTSD and Gulf War Illness. Research experience includes treatment outcome studies in PTSD and co-occurring disorders, as either principal or site investigator of single or multi-site trials. Other major areas of research include the neurobiology and genetics of PTSD, and the interface between PTSD and mTBI. I have received VA funding for studies focused on neurobiology, genetics and PTSD treatment, as well as federal funding for the Marine Resiliency Study (MRS/MRSII), as study PI. Primary areas of inquiry include PTSD, mTBI and associated problems. Toward this end, I am working closely with Dr. Mingxiong Huang to complete a longitudinal MEG study of active duty Marines (MRSII), to initiate a CDMRP study entitled "Patterns of tinnitus and hearing loss secondary to blast injury" as well as, next year, to implement "Investigating the Neurologic Effects of Training Associated Blast" (I-TAB) study (PI: Joshua Duckworth), a mental health and Imaging (MEG and High Definition Tract Scans) of Navy SEALs.

1. Agorastos A, Boel JA, Heppner PS, Hager T, Moeller-Bertram T, Haji U, Motazedi A, Yanagi MA, Baker DG, Stiedl O. Diminished vagal activity and blunted diurnal variation of heart rate dynamics in posttraumatic stress disorder. Stress. 2013; 16(3):300-10. PMID: 23167763.
2. Mustapic M, Maihofer AX, Mahata M, Chen Y, Baker DG, O'Connor DT, Nievergelt CM. The catecholamine biosynthetic enzyme dopamine β-hydroxylase (DBH): first genome-wide search positions trait-determining variants acting additively in the proximal promoter. Hum Mol Genet. 2014; 23(23):6375-84. PMID: 24986918
3. Agorastos A, Pittman JO, Angkaw AC, Nievergelt CM, Hansen CJ, Aversa LH, Parisi SA,Barkauskas DA, Marine Resiliency Study Team, Baker DG. The cumulative effect of different childhood trauma types on self-reported symptoms of adult male depression and PTSD, substance abuse and health-related quality of life in a large active-duty military cohort. J Psychiatr Res. 2014; 58:46-54. PMID: 25139009
4. Nievergelt CM, Maihofer AX, Mustapic M, Yurgil KA, Schork NJ, Miller MW, Logue MW, Geyer MA, Risbrough VB, O'Connor DT, Baker DG. Genomic predictors of combat stress vulnerability and resilience in U.S. Marines: A genome-wide association study across multiple ancestries implicates PRTFDC1 as a potential PTSD gene. Psychoneuroendocrinology. 2015; 51:459-71. PMID: 25456346

B. Positions and Honors

Position and Employment

1981-1982	Medical Internship – Christ Hospital , Cincinnati, Ohio
1982-1984	Psychiatric Residency, University of Cincinnati Medical Center
1984-1986	Fellowship – Division of Child and Adolescent Psychiatry, University of Cincinnati Medical Center
1986-1989	Assistant Professor of Child Psychiatry, University of Cincinnati College of Medicine Medical Director – Millcreek Psychiatric Center For Children, Cincinnati, Ohio
1989-1992	Assistant Professor of Psychiatry, University of Cincinnati College of Medicine Attending Psychiatrist, Inpatient Acute Psychiatry Cincinnati, Department of Veterans Affairs Medical Center
1992-2003	Director: PTSD/Postdeployment Unit, Cincinnati, Department of Veterans Affairs Medical Center
1992-2004	Associate Professor of Psychiatry, University of Cincinnati College of Medicine
2000-2004	Associate Director for Research, Mental Health Care Line Cincinnati, Department of Veterans Affairs Medical Center
2003-2004	Director: PTSD Research Unit and Gulf War Screening Clinic, Cincinnati VA
2004-2012	Associate Professor of Psychiatry, University of California San Deigo
2012-Present	Professor of Psychiatry, University of California San Deigo
2004-2007	Director: PTSD/Stress Disorders Program, VA San Deigo Healthcare System
2007-2008	Associate Director of Clinical Affairs: VA Center of Excellence for Stress and Mental Health
2008-Present	Director of Neuroscience/Research: VA Center of Excellence for Stress and Mental Health (CESAMH)

Honors

Ohio Psychiatric Association President's Recognition Award, May 1990
Cincinnati VAMC Recognition Award for Leadership & Service in Support of the VA and Operation Desert Storm, April 1991
Mental Health & Behavioral Science Director's Award, Posttraumatic Stress Disorder Program, September 1994

C. Contribution to Science

1. A primary focus on my work has been a better understanding the neurobiology of PTSD. Both early and continued work has involved characterization of neuro-endocrine peptides and hormones which, while they have wide brain distribution that provides a plausible substrate for their relevance to stress and mental health, often have divergent levels, circadian rhythms, and functions across the blood-brain barrier. Thus, this work has focused on measurement of relevant peptides, hormones and cytokines, measured in cerebrospinal fluid which bathes the brain, collected serially over a multi-hour timeframe using an indwelling subarachnoid catheter, and in blood, collecting concurrently via an intravenous catheter. This body of work has provided: 1) information about PTSD symptoms and key central neuropeptides, e.g. norepinephrine, neuropeptide Y, corticotropin-releasing factor and HPA-axis hormones; 2) the effect of stress on these same neuropeptides and hormones; and 3) CSF and plasma levels and circadian rhythms of these neuropeptides, and cytokines. These studies were funded by VA MERIT grants; I served as primary investigator or co-investigator on all of these studies. A selection from the twenty one published papers from this body of work, in healthy and symptomatic individuals, is listed.

a. Baker DG, West SA, Nicholson WE, Ekhator NN, Kasckow JW, Hill KK, Bruce AB, Orth DN, Geracriot TD. Serial CSF Corticotropin-Releasing Hormone Levels and Adrenocortical Activity in Combat Veterans with Posttraumatic Stress Disorder *Am J Psych*. 1999; 156:585-588. PMID: 10200738
b. Geracioti TD Jr, Baker DG, Kasckow JW, Strawn JR, Jeffrey Mulchahey J, Dashevsky BA, Horn PS, Ekhator NN. Effects of trauma-related audiovisual stimulation on cerebrospinal fluid norepinephrine and corticotropin-releasing hormone concentrations in post-traumatic stress disorder. *Psychoneuroendocrinology.* 2008; 33:416-424. PMID: 18295412
c. Baker DG, Bertram TM, Patel PM, Barkauskas DA, Clopton P, Patel S, Geracioti TD Jr, Haji U, O'Connor DT, Nievergelt CM, Hauger RL. Characterization of cerebrospinal fluid (CSF) and plasma

NPY levels in normal volunteers over a 24-h timeframe. *Psychoneuroendocrinology*. 2013; 38(10):2378-82. PMID: 23759334

d. Agorastos A, Hauger RL, Barkauskas DA, Moeller-Bertram T, Clopton PL, Haji U, Lohr JB, Geracioti TD Jr, Patel PM, Chrousos GP, Baker DG. Circadian rhythmicity, variability and correlation of interleukin-6 levels in plasma and cerebrospinal fluid of healthy men. *Psychoneuroendocrinology*. 2014; 44:71-82. PMID: 24767621

2. A second, but related line of research, involves design and implementation of a prospective longitudinal study of active duty Marines deploying to combat. The study, entitled Marine Resiliency Study (MRSI/MRSII), is designed to address the limitations inherent in cross-sectional studies, and is focused on a broad array of psychosocial, physiological and biological factors potentially predictive of risk and resilience for PTSD. This research was funded jointly by VA HSR&D and DoD (Marine Corps and Navy BUMED). Selected papers are.

a. Baker DG, Nash WP, Litz BT, Geyer MA, Risbrough VB, Nievergelt CM, O'Connor DT, Larson GE, Schork NJ, Vasterling JJ, Hammer PS, Webb-Murphy JA; MRS Team. Predictors of risk and resilience for posttraumatic stress disorder among ground combat Marines: methods of the Marine Resiliency Study. *Prev Chronic Dis*. 2012; 9:E97. PMID: 22575082
b. Yurgil KA, Barkauskas, DA, Vasterling, JJ, Nievergelt, CM, Larson, GE, Schork, NJ, Litz, BT, Nash WP, MRS Team, and Baker DG. Association between traumatic brain injury and risk of posttraumatic stress disorder in active-duty Marines. *JAMA Psychiatry*. 2014; 71(2):149-57. PMID: 24337530
c. Minassian A, Maihofer A, , Baker DG, Nievergelt CM, Geyer MA, Risbrough VB, Marine Resiliency Study Team. Association of Predeployment Heart Rate Variability With Risk of Postdeployment Posttraumatic Stress Disorder in Active-Duty Marines. *JAMA Psychiatry*, Sept 9, 2015 doi:10.1001/jamapsychiatry.2015.0922
d. Acheson DT, Geyer MA, Baker DG, Nievergelt CM, Yurgil K, Risbrough VB; MRS-II Team. Conditioned fear and extinction learning performance and its association with psychiatric symptoms in active duty Marines. *Psychoneuroendocrinology.* 2015; 51:495-505. PMID: 25444643

3. There are strong biological underpinnings for participation of the immune system in the pathogenesis of Posttraumatic Stress Disorder (PTSD), including evidence for cross-talk between the stress and immune systems, as well as roles for immune system mediators in core behavioral functions, e.g. processes that underlay synaptic plasticity, such as learning and memory. A major line of inquiry in my work has been investigation of the role of the immune system in PTSD. The body of research has focused on whether the immune system is involved in PTSD risk following a trauma event, and both whether and how persistent inflammation might contribute to the physical conditions co-occurring with chronic PTSD, e.g. atherosclerotic heart disease, autoimmune disorders, and dementia.

a. Baker DG, Nievergelt CM, O'Connor DT. Biomarkers of PTSD: Neuropeptides and immune signaling. *Neuropharmacology.* 2012; 62(2):663-73. PMID: 21392516
b. Eraly SA, Nievergelt CM, Maihofer AX, Barkauskas DA, Biswas N, Agorastos A, O'Connor DT, Baker DG; for the Marine Resiliency Study Team. Assessment of Plasma C-Reactive Protein as a Biomarker of Posttraumatic Stress Disorder Risk. *JAMA Psychiatry*. 2014; 71(4):423-31. PMID: 24576974
c. Glatt SJ(1), Tylee DS, Chandler SD, Pazol J, Nievergelt CM, Woelk CH, Baker DG, Lohr JB, Kremen WS, Litz BT, Tsuang MT; Marine Resiliency Study Investigators. Blood-based gene-expression predictors of PTSD risk and resilience among deployed marines: a pilot study. *Am J Med Genet B Neuropsychiatr Genet*. 2013; 162B(4):313-26. PMID: 23650250
d. Breen MS, Maihofer AX, Glatt SJ, Tylee DS, Chandler SD, Tsuang MT, Risbrough VB, Baker DG, O'Connor DT, Nievergelt CM, Woelk CH. Gene networks specific for innate immunity define post-traumatic stress disorder. *Mol Psychiatry*. 2015 Mar 10. [Epub ahead of print]. PMID: 25754082

4. In the past 10 years, as a large number of blast-exposed patients came to my clinics, I became concerned about accurate diagnosis of mTBI, especially in individuals with co-occurring PTSD, since the symptoms are often similar or overlapping. While PTSD was easy to diagnose, mTBI was not. I teamed with a colleague, Mingxiong Huang Ph.D., who had developed advanced algorithms for magnetoencephalogram (MEG) scans to detect delta wave slowing, a potential marker for mTBI. In the past decade I have worked closely with Dr. Huang to further development of an accurate diagnostic marker for mTBI and PTSD.

a. Huang MX, Theilmann RJ, Robb A, Angeles A, Nichols S, Drake A, D'Andrea J, Levy M, Holland M, Song T, Ge S, Hwang E, Yoo K, Cui L, Baker DG, Trauner D, Coimbra R, Lee RR. Integrated imaging

approach with MEG and DTI to detect mild traumatic brain injury in military and civilian patients. *J Neurotrauma.* 2009; 26(8):1213-26. PMID: 19385722

b. Huang MX, Yurgil KA, Robb A, Angeles A, Diwakar M, Risbrough VB, Nichols SL, McLay R, Theilmann RJ, Song T, Huang CW, Lee RR, Baker DG. Voxel-wise resting-state MEG source magnitude imaging study reveals neurocircuitry abnormality in active-duty service members and veterans with PTSD. *Neuroimage Clin.* 2014; 5:408-19. PMID: 25180160; PMCID: PMC4145534

c. Huang MX, Nichols S, Baker DG, Robb A, Angeles A, Yurgil KA, Drake A, Levy M, Song T, McLay R, Theilmann RJ, Diwakar M, Risbrough VB, Ji Z, Huang CW, Chang DG, Harrington DL, Muzzatti L, Canive JM, Christopher Edgar J, Chen YH, Lee RR. Single-subject-based whole-brain MEG slow-wave imaging approach for detecting abnormality in patients with mild traumatic brain injury. *Neuroimage Clin.* 2014; 5:109-19. PMID: 25009772; PMCID: PMC4087185

d. Huang M, Risling M, Baker DG. The role of biomarkers and MEG-based imaging markers in the diagnosis of post-traumatic stress disorder and blast-induced mild traumatic brain injury. *Psychoneuroendocrinology*. 2015 Feb 23. [Epub ahead of print]. PMID: 25769625.

5. I have developed, and participated in a number of pharmaceutical and psychosocial treatment studies, federal and industry funded, single and multiple-site, throughout my career.

a. Baker DG, Diamond BI, Gillette G, Hamner M, Katzelnick D, Keller T, Mellman TA, Pontius E, Rosenthal M, Tucker P, vander Kolk BA, Katz R. Double-Blind Randomized, Placebo-Controlled Multi-Center Study of Brofaromine in the Treatment of Posttraumatic Stress Disorder. *Psychopharmacology.* 1995;122: 386-389.

b. Brady K, Perlstein T, Asnis GM, Baker DG, Rothbaum B, Sikes CR, Farfel GM. Double-Blind, Placebo-controlled study of the efficacy and safety of sertraline treatment of posttraumatic stress disorder. *JAMA.* 2000; 283:1837-1844.

c. Friedman MJ, Marmar CR, Baker DG, Sikes CR, Farfel GM. Randomized, double-blind comparison of sertraline and placebo for posttraumatic stress disorder in a Department of Veterans Affairs setting. *J Clinical Psychiatry*. 2007; 68:711-720.

d. McFall M, Saxon AJ, Malte CA, Chow B, Bailey S, Baker DG, Beckham JC, Boardman KD, Carmody TP, Joseph AM, Smith MW, Shih MC, Lu Y, Holodny M, Lavori PW; CSP 519 Study Team. Integrating tobacco cessation into mental health care for posttraumatic stress disorder: a randomized controlled trial. *JAMA*. 2010; 304:2485-2493.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1NMHxPwgt_8kw/collections/47848406/public/

D. Research Support

Ongoing Research Support

Henry Jackson Foundation Duckworth (PI) 2/1/16 – 2/1/18 (Pending)
Investigating the Neurologic Effects of Training Associated Blast (I-TAB)
This is a prospective, longitudinal study of the effects of blast associated mTBI
Role: Site PI

CDMRP Kosten (PI) 10/1/2015 – 10/1/2019
DoD Alcohol and Substance Abuse Consortium Award
This is a DoD funded consortium to study effects and treatment of co-occurring PTSD/Alcohol and substance abuse
Role: Site PI

VA CSR&D Huang (PI) 10/1/2015-10/1/2021 (Renewal)
Diagnosing Mild TBI in VA and Active Duty Military Patients using MEG and DTI
This project studies the diagnostic value of magnetoencephalography and diffusion tensor imaging for diagnosis of PTSD and mild TBI patients in both veteran and active-duty military populations
Role: Co-Investigator

CDMRP Baker (PI) 1/4/2016 – 10/1/2019
Patterns of Tinnitus and Hearing Loss Secondary to Blast Injury
This study involves recall of all Marines from MRS for screening and brief assessment and on-site assessment of 200 Marines for MEG scans and full assessment for PTSD, mTBI and tinnitus
Role: Principal Investigator

Navy SEAL Family Fund Baker (PI) 1/1/2015 – 1/1/2016
Navy SEAL Breecher Study
This is a pilot study designed to obtain pilot imaging data across two of the most advanced imaging methods, e.g. MEG, which has a very high (nearly 90%) detection rate of brain injury from blast exposure and HDFT, which allows for vivid visualization of nerve fiber damage.
Role: Principal Investigator

Navy BUMED Baker (PI) 9/20/2014 – 3/1/2016 Funded extension
MRS II
This aim of this study is to provide a platform for early analysis of predictors of mental health outcomes in Marines and suicidal correlates, in coordination with the Army Study of Risk and Resilience (STARRS) program.
Role: Principal investigator

VA CSR&D CCTA # 0004 Golier (PI) 10/16/12-10/16/16
Novel Therapeutics in PTSD: A Randomized Clinical Trial of Mifepristone
This is a four-site (VA cooperative study program organized) placebo-controlled double-blind crossover study designed to assess the efficacy of the glucocorticoid antagonist, Mifepristone, in treating veterans chronic PTSD
Role: Site Investigator

VA CSR&D Huang (PI) 1/2011-1/2015
Diagnosing Mild TBI in VA and Active Duty Military Patients using MEG and DTI
This project studies the diagnostic value of magnetoencephalography and diffusion tensor imaging for diagnosis of PTSD and mild TBI patients in both veteran and active-duty military populations
Role: Co-Investigator

VA CESAMH Baker (Unit Director) 10/06-Current
Health and Neuroscience Unit
To conduct research on neurobiological alterations and their relation to health care outcomes of severe (traumatic) and chronic stress

Recently Completed Research Support
Navy BUMED Baker (PI) 9/20/2011 – 9/20/2014
MRS II
This aim of this study is to provide a platform for early analysis of predictors of mental health outcomes in Marines and suicidal correlates, in coordination with Army Study of Risk and Resilience (STARRS).
Role: Principal investigator

1R01MH093500-01 Nievergelt (PI) 5/01/2011-04/30/2014
Genomic Predictors of Combat Stress Vulnerability and Resilience
Major goals: To identify genetic variants and to develop integrated predictive models that leverage genetic and non-genetic factors to identify individuals at risk for developing PTSD.
Role: Co-Investigator

VA HSR&D Baker (co-PI) w/Litz, Nash 10/01/2009 – 10/01/2012
Marine Resiliency Study
This aim of this study is to prospectively and longitudinal collect and evaluate data across psychosocial, psychophysiological and biological domains in order to determine risk and resilience factors for PTSD in 3 and a half battalions of Marines deploying to Iraq and Afghanistan