BIOGRAPHICAL SKETCH

NAME: Leanne Williams, PhD

POSITION TITLE: Vincent V.C. Woo Professor, Psychiatry and Behavioral Sciences, Stanford University

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Queensland, Australia	BA	03/1987	Psychology
University of New England, Australia	BA, First Class Honors	02/1990	Psychology
University of New England, with scholarship to Oxford University, UK	PhD	03/1996	Cognitive Neuroscience

Personal Statement

My scientific career has been guided by a central challenge: understanding the biological basis of heterogeneity in mental disorders and translating that understanding into improved treatment outcomes. This focus emerged from my early clinical work with individuals transitioning from long-stay psychiatric institutions and young people recovering from early psychosis. Working closely with patients revealed the extraordinary variability in outcomes among individuals who shared the same diagnosis and highlighted the need for biologically informed approaches that could explain and address this heterogeneity.

During my graduate and early faculty years, precision oncology demonstrated that diseases, once viewed as single entities, could be divided into biologically distinct subtypes requiring different treatments. At the same time, major depression emerged as the leading cause of disability worldwide. These developments reinforced my conviction that psychiatry required objective measures of the organ it treats—the brain—and that neural circuitry could provide the foundation for a precision medicine framework.

My work has therefore focused on establishing neural circuits as a biological foundation for precision psychiatry. I developed standardized neuroimaging paradigms and analytic approaches for characterizing large-scale brain systems involved in cognition, emotion, and adaptive behavior, culminating in the first neural circuit taxonomy for depression and anxiety disorders (*Lancet Psychiatry*, 2016). To translate this framework into clinically actionable tools, I led the International Study to Predict Optimized Treatment in Depression (iSPOT-D), the first international biomarker trial in major depressive disorder, and subsequently developed the first patient-level platform for quantifying neural circuit dysfunction using norm-referenced functional neuroimaging.

Using this platform, my laboratory identified reproducible depression biotypes that differ in symptoms, cognition, behavior, and treatment outcomes, providing the first data-driven validation of a neural circuit taxonomy at the individual patient level. I then translated these discoveries into prospective precision medicine studies demonstrating that neural circuit biotypes can identify patients unlikely to benefit from standard treatments and predict preferential response to targeted alternatives spanning psychotherapy, neuromodulation, rapid-acting interventions, and circuit-targeted pharmacology.

Collectively, these contributions have established a translational pathway from neural circuitry to personalized mental health care. This work is now being advanced through the Stanford Center for Precision Mental Health, the NIMH ACE-D program, and the international Precision Mental Health Commission that I was invited to lead in partnership with *Nature Mental Health*.

Faculty Positions

2022 – present Endowed Vincent V.C. Woo Professor of Psychiatry and Behavioral Sciences, Stanford University School of Medicine
2018 – present Founding Director of the Stanford Center for Precision Mental Health
2013 – present Founding Director, Personalized and Translational Neuroscience Lab (PanLab), Stanford University
2013 – 2022 Professor, Psychiatry and Behavioral Sciences, Stanford University School of Medicine
2012 – present Director of Precision Medicine Core, MIRECC VISN21, VA Palo Alto
2007 – 2013 Inaugural Professor in Cognitive Neuropsychiatry, University of Sydney Medical School

2004 – 2006 Associate Professor, Psychiatry, University of Sydney Medical School
2002 – 2004 Associate Professor, Psychology, University of Sydney
2002 – 2012 Founding Director, Brain Dynamics Center, Sydney Medical School
1999 – 2001 Senior Lecturer (tenured), Psychology, University of Sydney

Selected Leadership Positions
2023 – 2026 Councillor-at-Large, Society of Biological Psychiatry
2019 – 2021 Member, World Economic Forum Global Future Council on Technology for Mental Health
2015 – 2019 Member, Advisory Board, ONE MIND PsyberGuide, One Mind Institute
2013 – 2016 Executive member, ACNP membership committee
2005 – 2016 Founding CEO/ President, BRAINnet Foundation, 501c (3) for data sharing across 37 countries

Selected Career Metrics
Ranked 207th among 85,760 Psychiatry scientists worldwide in the Elsevier–Scopus database of career-long citation impact (top 0.25% globally).
Publications: 400+
Total citations: >49,000
H-index: 129
First-author publications: 59
Senior-authorship publications: 169
Continuous federal support: 27 years
Total research support: >$151 million
Issued Patents: 7
Total trainees mentored: 144
27 former trainees now hold independent faculty positions, including department chairs and full professors

Selected Honors
2026 Society of Biological Psychiatry Gold Medal Award
2025 The Perry Award
2023 SOBP Educator Award
2023 Stanford Senior Faculty Mentor Award
2022 SOBP George Thompson Award
2012 Ernst Strüngmann Award
2008 Presidential Award
2005 Pfizer Foundation Senior Research Fellowship
1990 Australian Postgraduate Research Award

Major Contributions to Science

1. Establishing the Neural Circuit Framework for Precision Psychiatry

I have advanced a precision psychiatry framework grounded in dissecting the heterogeneity of the organ we treat, the brain. My cognitive and affective neuroscience research established normative trajectories of neural circuits across the lifespan. I pioneered the development, validation and application of standardized functional MRI protocols for acquiring both resting and task data across healthy and multiple diagnostic cohorts. Through this approach, I have established the neuroanatomical definition and function of neural circuits that are commonly implicated in major depression, anxiety and related disorders. For example, among my earlier work I validated a paradigm for probing both direct and indirect (low-road) pathways to the amygdala, engaged by fear stimuli, and characterized the cortical and subcortical regions that define these pathways. This paradigm was incorporated into standardized functional MRI protocols and used to acquire clinical samples across both observational and treatment designs. These standardized protocols are now used internationally across observational and treatment studies. To advance the clinical translation of a circuit-based precision psychiatry approach, I published a seminal paper in *Lancet Psychiatry*, proposing a taxonomy of depression and anxiety biotypes, clinically relevant subgroups defined by distinct circuit dysfunctions. Synthesizing neuroimaging evidence, it is widely regarded as a leap forward for precision psychiatry and provides the conceptual foundation for the subsequent development of neural circuit biotypes and precision treatment selection.

a. Liddell BJ, Brown KJ, Kemp AH, Barton MJ, Das P, Peduto AS, Gordon E, **Williams LM** (2005). A direct brainstem-amygdala-cortical 'alarm' system for subliminal signals of fear. *NeuroImage*, 24(1):235-243. PMID: 15588615
FWCI 6.21; 99th percentile globally (Scopus).

b. **Williams LM**, Brown KJ, Palmer D, Liddell BJ, Kemp AH, Olivieri G, Peduto A, Gordon E (2006). The 'mellow years'?: Neural basis of improving emotional stability over age. *Journal of Neuroscience*, 26(24):6422-6430. PMID: 16775129; PMCID: PMC6674038
FWCI 2.79; 98th percentile globally (Scopus).

c. Korgaonkar MS, Grieve SM, Etkin A, Koslow SH, **Williams LM** (2013). Using standardized fMRI protocols to identify patterns of prefrontal circuit dysregulation that are common and specific to cognitive and emotional tasks in major depressive disorder: First wave results from the iSPOT-D study. *Neuropsychopharmacology*, 38(5), 863-871. PMID: 23303059; PMCID: PMC3671994
FWCI 3.34; 97th percentile globally (Scopus).

d. **Williams LM (2016).** Precision Psychiatry: A neural circuit taxonomy for depression and anxiety. *The Lancet Psychiatry*, 3(5):472-480. PMID: 27150382; PMCID: PMC4922884
ESI Highly Cited Paper (Web of Science). FWCI 3.97; 99th percentile globally (Scopus).

2. Creating the First International Biomarker Program for Treatment Prediction

As academic principal investigator of the International Study to Predict Optimized Treatment in Depression (iSPOT-D), I led the first international biomarker trial designed to predict differential treatment outcomes in major depressive disorder, enrolling more than 1,000 participants across 17 sites in five countries. The goal was to determine whether objective measures of brain circuitry could predict differential response to antidepressant treatments before treatment begins. Through a series of studies spanning emotional, cognitive, reward, and connectome-level circuits, my laboratory demonstrated that neural circuitry predicts both treatment response and remission outcomes. These findings established the first large-scale evidence that brain-based biomarkers can support treatment selection in depression and provided a foundation for precision psychiatry approaches now being tested prospectively in clinical trials.

a. **Williams LM,** Korgaonkar MS, Song YC, Paton R, Eagles S, Etkin A, Gordon E (2015). Amygdala reactivity to emotional faces in the prediction of general and medication-specific responses to antidepressant treatment in the randomized iSPOT-D trial. *Neuropsychopharmacology*, 40(10):2398-2408. PMID: 25824424; PMCID: PMC4538354
FWCI 5.81; 97th percentile globally (Scopus).

b. Goldstein-Piekarski AN, Staveland B, Ball T, Yesavage J, Korgaonkar MS, **Williams LM** (2018). Intrinsic functional connectivity predicts remission on antidepressants: A randomized-controlled trial to identify clinically applicable imaging biomarkers. *Translational Psychiatry*, 8(1), 57. PMID: 29507282; PMCID: PMC5838245
FWCI 2.79; 96th percentile globally (Scopus).

c. Tozzi L, Goldstein-Piekarski AN, Korgaonkar MS, **Williams LM** (2019). Connectivity of the cognitive control network during response inhibition as a predictive and response biomarker in major depression: Evidence from a randomized clinical trial. *Biological Psychiatry*, 87(5):462-472. PMID: 31601424; PMCID: PMC8628639
FWCI 1.85; 95th percentile globally (Scopus).

d. Korgaonkar MS, Goldstein-Piekarski AN, Fornito A, **Williams LM** (2019). Intrinsic connectomes are a predictive biomarker of remission in major depressive disorder. *Molecular Psychiatry*, 25(7), 1537 1549. PMID: 31695168; PMCID: PMC7303006
FWCI 5.47; 98th percentile globally (Scopus).

e. Fischer AS, Holt-Gosselin B, Fleming SL, Hack LM, Ball TM, Schatzberg AF, **Williams LM** (2021). Intrinsic reward circuit connectivity profiles underlying symptom and quality of life outcomes following antidepressant medication: a report from the iSPOT-D trial. *Neuropsychopharmacology*, 46(4), 809-819. PMID: 33230268; PMCID: PMC8027440
FWCI 1.35; 83rd percentile globally (Scopus).

3. Developing Patient-Level Circuit Quantification and Depression Biotypes

A major advance in my work has been the transition from group-level biomarkers to patient-level quantification of neural circuitry. To achieve this, I developed a norm-referenced framework that quantifies circuit function for each individual relative to a healthy reference population, analogous to neuropsychological testing. This innovation produces intuitive personalized circuit scores and enables clinically interpretable measurement of brain function at the individual level. Using these personalized circuit measures, my laboratory identified six reproducible depression biotypes that explain approximately 90% of the heterogeneity observed across depression and anxiety disorders. This work transformed neural circuit dysfunction from a group-level research observation into an individualized measure suitable for clinical decision support. The findings establish a biologically grounded framework for stratified treatment selection and provided the first reproducible neural circuit taxonomy validated at the level of individual patients. The resulting biotyping platform is protected by seven issued patents and now serves as the foundation for ongoing precision psychiatry research, clinical implementation programs and prospective treatment-selection studies.

a. Grisanzio KA, Goldstein-Piekarski AN, Wang MY, Ahmed APR, Samara Z, **Williams LM** (2018). Transdiagnostic symptom clusters and associations with brain, behavior, and daily function across mood, anxiety, and trauma disorders. *JAMA Psychiatry*, 75(2):201-209. PMID: 29197929; PMCID: PMC5838569
FWCI 6.68; 99th percentile globally (Scopus).

b. Goldstein-Piekarski AN, Ball TM, Samara Z, Staveland BR, Keller AS, Fleming SL, Grisanzio KA, Holt-Gosselin B, Stetz P, Ma J, **Williams LM** (2022). Mapping neural circuit biotypes to symptoms and behavioral dimensions of depression and anxiety. *Biological Psychiatry*, 91(6):561-571.
PMID: 34482948; PMCID: PMC9511971.
FWCI 7.67; 99th percentile globally (Scopus).

c. Hack LM, Tozzi L, Zenteno S, Olmsted AM, Hilton, Jubeir J, Korgaonkar MS, Schatzberg AF, Yesavage JA, O'Hara R, **Williams LM** (2023). A cognitive biotype of depression linking symptoms, behavior measures, neural circuits, and differential treatment outcomes: A randomized clinical trial. *JAMA Network Open*, 6(6):e2318411. PMID: 37318808; PMCID: PMC10273022
FWCI 14.18; 99th percentile globally (Scopus).

d. Tozzi L, Zhang X, Pines A, Olmsted AM, Zhai ES, Anene ET, Chesnut M, Holt-Gosselin B, Chang S, Stetz PC, Ramirez CA, Hack LM, Korgaonkar MS, Wintermark M, Gotlib IH, Ma J, **Williams LM** (2024). Personalized brain circuit scores identify clinically distinct biotypes in depression and anxiety. *Nature Medicine*, 30(7):2076-2087. PMID: 38886626; PMCID: PMC11271415
ESI Highly Cited Paper (Web of Science). FWCI 26.35; 99th percentile globally (Scopus).

Commentary: Dunlop BW, Mayberg HS (2024). The capacity of brain circuits to enhance psychiatry. *Nature Medicine*, 30(7):1834-1835. PMID: 38937589 doi: 10.1038/s41591-024-03090-8

4. Translating Neural Circuit Biotypes into Mechanism-Based Treatment Selection

Having established reproducible neural circuit biotypes, I next demonstrated that these biotypes predict differential response across fundamentally distinct treatment modalities.

These studies demonstrate that distinct neural circuit biotypes are linked to distinct treatment mechanisms. Distinct negative affect circuit biotypes identified selective responsiveness to rapid-acting interventions, including ketamine and MDMA. In parallel, distinct cognitive control circuit biotypes identified non-response to standard antidepressants and preferential responsiveness to behavioral therapy versus transcranial magnetic stimulation. In the first prospective stratified precision medicine trial targeting a biologically defined depression subtype with the alpha-2A agonist guanfacine, patients selected on the basis of cognitive-control circuit dysfunction achieved

77% response rates, with 85% of responders reaching remission. Across these interventions, circuit-defined biotypes identify both patients unlikely to benefit from standard treatments and those most likely to respond to targeted alternatives. Collectively these studies demonstrate that neural circuitry can serve as a practical foundation for mechanism-based treatment selection in psychiatry.

a. Zhang X, Pines A, Stetz P, Goldstein-Piekarski AN, Xiao L, Lv N, Tozzi L, Lavori PW, Snowden MD, Venditti EM, Smyth JM, Suppes T, Ajilore O, Ma J, **Williams LM** (2024). Adaptive cognitive control circuit changes associated with the problem-solving ability and depression symptom outcomes over 24 months. *Science Translational Medicine*, 16(763): eadh3172. PMID: 39231241; PMCID: PMC12286721

b. Tozzi L, Bertrand C, Hack LM, Lyons T, Olmsted AM, Rajasekharan D, Chen T, Berlow YA, Yesavage JA, Lim K, Madore M, Philip NS, Holtzheimer P, **Williams LM** (2024). A cognitive neural circuit biotype of depression showing functional and behavioral improvement after transcranial magnetic stimulation in the B-SMART-fMRI trial. *Nature Mental Health*, 30(7):2076-2087. PMID: 38886626; PMCID: PMC11271415

c. Zhang X, Hack LM, Bertrand C, Hilton R, Gray NJ, Boyar L, Laudie J, Heifets BD, Suppes T, van Roessel PJ, Rodriguez CI, Deisseroth K, Knutson B, **Williams LM** (2025). Negative Affect Circuit Subtypes and Neural, Behavioral, and Affective Responses to MDMA: A Randomized Clinical Trial. *JAMA Network Open*, 8(4), e257803. PMID: 40305021; PMCID: PMC12044494

d. Hack LM, Jubeir J, Hilton R, Tozzi L, Boyar L, Zhang X, Lyons T, Jo B, O'Hara R, Schatzberg AF, **Williams LM** (2025). A stratified precision medicine trial targeting α2A-adrenergic receptor agonism as a treatment for the cognitive biotype of depression. Nature Mental Health, 3(11):1363-1373. PMID: 41211529; PMCID: PMC12589093

Collectively, these contributions led to my invitation in 2026 to lead the international Precision Mental Health Commission in partnership with *Nature Mental Health*.

Williams LM, Foland-Ross LC, Wintermark M (2026). The Precision Mental Health Commission: transforming mental health through brain circuit science. *Nature Mental Health*, 4, 883–885.

Complete list of published work. For the list of 415 publications included in MyBibliography on NCBI: https://www.ncbi.nlm.nih.gov/myncbi/1BaGkg3Fizwkx/bibliography/public/