
Brain Chemistry Labs
ANNUAL REPORT
2025

Letter From the Chair

Brain Chemistry Labs is an innovative not-for-profit research laboratory with the unique mission of discovering novel ways to prevent, diagnose, and treat brain diseases, including ALS, Alzheimer's, Parkinson's, and glioblastoma.

In 2025, we made rapid progress in developing single-blood-draw diagnostic tests for neurological diseases. We anticipate soon having our microRNA ALS diagnostic ready for clinical use as a Laboratory Developed Test (LDT). We will have data from our Phase II clinical trial of L-serine for the treatment of Mild Cognitive Impairment in November. Separate Phase II trials will begin soon for the treatment of ALS and Parkinson's disease.

Brain Chemistry Labs' diligent staff and capable scientific team cannot be sufficiently acknowledged or thanked for these amazing discoveries, which have the potential to significantly improve patient outcomes throughout the world. The collaboration with an international consortium of multi-disciplinary scientists toward major achievements and advances, despite a modest budget, is inspiring.

The Board of Directors has been completely supportive of this significant scientific progress. We sincerely express gratitude to all our generous donors, advisors, and partners who have helped us move this important work forward. It has been an outstanding year of donor

support, allowing significant scientific progress. You have been instrumental in helping us achieve our vision and our mission:

Vision Statement: Brain Chemistry Labs strives toward a world free of debilitating brain diseases.

Mission Statement: Brain Chemistry Labs seeks to improve patient outcomes by discovering innovative solutions to prevent, diagnose, and treat neurodegenerative diseases.

We invite your continued support.

Cordially,

Sue Severson
Chair
Brain Chemistry Labs





Our discovery that environmental toxins increase Alzheimer's risk is pioneering.

"When I started looking into dementia and Alzheimer's, I didn't expect to be coming here. Nestled in these majestic Wyoming mountains is Dr. Paul Cox and his small non-profit, Brain Chemistry Labs."

– Dr. Sanjay Gupta, CNN



Dr. Paul Alan Cox

With 50 scientists in our research consortium, we explore approaches not considered by Big Pharma.

"It's hard not to see in [Brain Chemistry Labs] grassroots international consortium a research model that's more flexible, responsive, curious, and humbly collaborative than the siloed, conservative approach of the pharmaceutical industry."

– *Fortune*



Christofer Olan, B.S., M.S.



Dr. Sandra Banack



Dr. Rachael Dunlop



Dr. James Metcalf

Our ALS test will soon be available to physicians.

Currently, many ALS patients have to wait for a year or more to receive an accurate diagnosis. During that time, a few even receive medical treatment that is inappropriate, or worse, damaging. We have developed a new blood test for ALS that is 97% accurate.

Our new microRNA diagnostic test will be available to physicians in late 2026. This highly accurate test based on microRNA will allow patients to be quickly referred to neurologists for complete diagnosis and early treatment.

Prevention

We are monitoring the neurotoxin BMAA in dust from the Great Salt Lake, in coastal environments in Florida, and throughout the world.



Our discoveries help prevent, diagnose, and treat progressive neurodegenerative diseases.

Diagnosis

We discovered a microRNA blood test to help diagnose ALS at an early stage. This will soon be available to clinicians throughout the United States. We have also invented a blood test for early-stage Alzheimer's disease & Parkinson's.

Treatment

Our FDA-approved clinical trial for Mild Cognitive Impairment will conclude in a few months at Houston Methodist. Principal Investigator Dr. Gustavo Roman is Co-Director of the Nantz National Alzheimer Center.



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Discovery: ALS Diagnostics



Dr. Rachael Dunlop

The 2024 Nobel Prize was awarded to Drs. Victor Ambros and Gary Ruvkun for the discovery of microRNA, small sequences of RNA that regulate gene expression. With blood samples from the Centers for Disease Control (CDC), we discovered that ALS patients have a unique microRNA sequence in their blood. We have now developed this technology into a rapid diagnostic test. Similar tests for Parkinson's, Alzheimer's, and Multiple Sclerosis are under development.

Discovery: ALS Therapy



Gloria Polis



Dr. William Christensen

Oxford's *Journal of Neuropathology & Experimental Neurology* published in 2020 our discovery that L-serine blocks the formation of ALS neuropathology. Unfortunately, our advanced clinical trial of L-serine for ALS was halted during the COVID pandemic. Statistical analysis by Dr. William Christensen of the 28 patients who completely finished the trial showed a significant slowing of their disease progression. With a lead gift from Gloria Polis in Jackson, Wyoming, we plan to redo this trial beginning in 2026.

Discovery:
It is possible to prevent Alzheimer's.

Alzheimer's is unknown among the 90- and 100-year-old residents of Ogimi village in Okinawa. Our analysis of their traditional diet shows that they receive 4-5 times the amount of L-serine in American diets. Our FDA-approved clinical trial of L-serine for the treatment of Mild Cognitive Impairment at Houston Methodist is nearing completion. The results of this randomized, placebo-controlled, double-blinded trial will be available late in 2026. If successful, this trial will substantiate our ethnobotanical discoveries in Okinawa.



Discovery:
A New Drug for Parkinson's



We have identified a natural compound that stops misfolding of alpha-synuclein protein, which characterizes these diseases. Shaped like a slinky when properly folded, misfolded alpha-synuclein proteins aggregate and form Lewy bodies in different parts of the brain. Such protein misfolds also characterize Lewy Body Disease and Multiple System Atrophy. Our advanced clinical trial will begin next year.

Discovery:
Rapid Detection of the BMAA Neurotoxin



We have optimized the detection of BMAA and its neurotoxic isomers, but our analyses depend on expensive laboratory equipment. We have been developing a simple BMAA detection kit that can be used by water managers and lay people throughout the world. Based on antibodies, an approach similar to pregnancy tests, our kit will provide rapid and accurate detection of BMAA. We have polyclonal antibodies for this purpose and are working towards a monoclonal antibody produced by a single cell line.

Discovery:
Beached dolphins have Alzheimer's.



Just as canaries once were used as indicators for poisonous gas in mine shafts, dolphins in coastal waters can be sentinels for cyanobacterial toxins that cause neurological illness. Our discovery that cyanobacteria cause Alzheimer's in dolphins serves as a warning of dangerous toxins in coastal waters. Their brains are filled with the BMAA isomer 2,4-DAB and with Alzheimer's neuropathology. Our discovery of Alzheimer's in dolphins was deemed important enough to make the cover of the September 30, 2025 edition of *Nature Communications Biology*.

Discovery:
New Treatment for Glioblastoma





With our collegues at the Medical University of Vienna (above left, Drs. Walter Berger, Paul Cox, Christian Gruber , and Daniela Lötsch), we have been rapidly moving towards clinical trials for glioblastoma. We discovered that small circular proteins extracted from violets are effective in killing glioblastoma cells from living patients. We are moving as quickly as possbile towards a Phase I clinical trial for glioblastoma. Our discoveries bring new hope to adults and children who suffer from this lethal brain cancer. Our research has been turbocharged by the gift from Bobbie Sweet of a special Incucyte instrument (above right) used by Dr. Samantha Gerlach in Jackson Hole.

Scientific Articles Published in 2025





Dunlop RA, Cox PA, Mehta P, Stommel EW, Banack SA. miRNA Biomarkers Diagnose Amyotrophic Lateral Sclerosis in Circulating Blood. *Molecular Neurobiology*. 2026 Jan;63(1):298.

Morris ZJ, Stommel EW, Metcalf JS. Airborne Cyanobacterial Toxins and Their Links to Neurodegenerative Diseases. *Molecules*. 2025 May 26;30(11):2320.

Noke Durden W, Stolen MK, Garamszegi SP, Banack SA, Brzostowicki DJ, Vontell RT, Brand LE, Cox PA, Davis DA. Alzheimer's Disease Signatures in the Brain Transcriptome of Estuarine Dolphins. *Nature Communications Biology*. 2025 Sep 30;8(1):1400.

Scirocco E, Allen MD, Giacomelli E, Ajroud-Driss S, Andrews J, Banack S, Bede P, Benatar M, Cheung K, Corcia P, de Carvalho M, Elman L, Fink JK, Genge A, Hardiman O, Harms M, Heitzman D, Jang G, Kano O, Kiernan MC, Lee I, Ludolph A, Mehta P, Ozdinler H, Rezania K, Schito P, Sherman AV, Silani V, Sorenson E, Turner MR, Van Den Berg L, Mitsumoto H, Paganoni S. Toward Therapeutic Trials in Primary Lateral Sclerosis. *Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration*. 2025 Jul 5:1-8.

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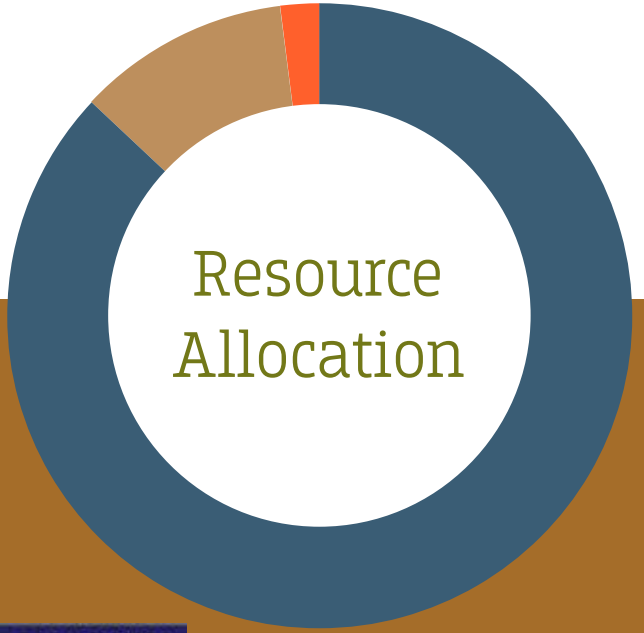


Finances

81% - Research

16% - Management

3% - Fundraising



Operating on an annual budget of $3.3 million, the Brain Chemistry Labs ensures that each donated dollar is carefully used. Based on our 2025 audit—which continued the string of "clean" audits since we began our laboratory—Brain Chemistry Labs devotes 81% of all gifts to medical research, with only 16% used for management and legal costs, and a scarce 3% for fundraising. Our complete audit document is available upon request.

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Dr. Samantha Gerlach



Bekka Davis, B.S.



Christofer Olan, B.S., M.S.



Dr. David Davis

CNN Documentary

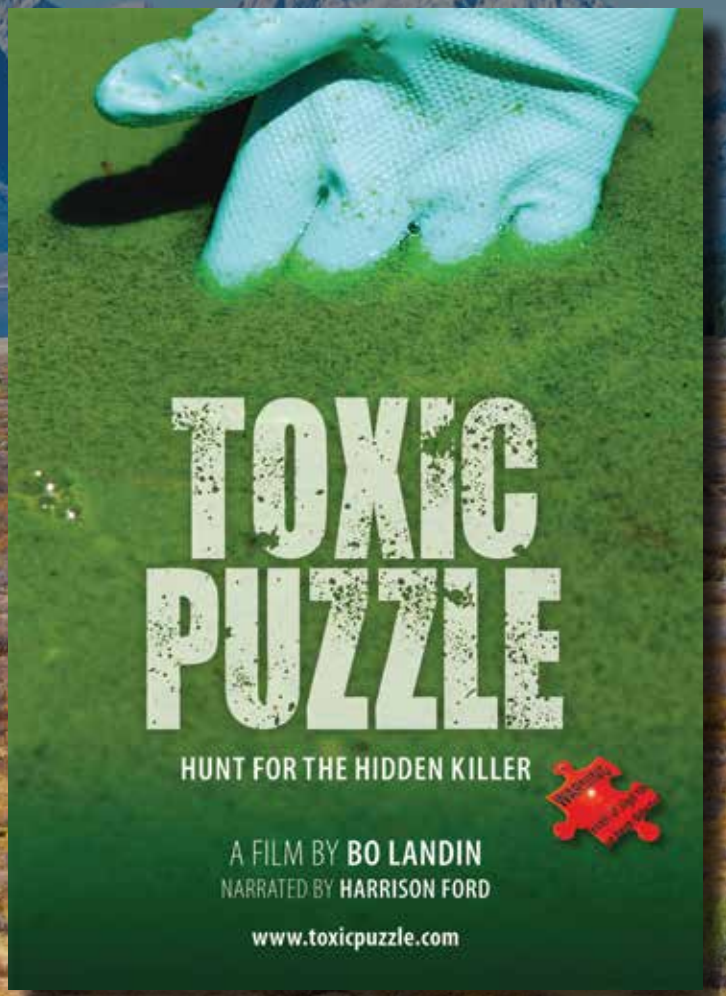
A film crew led by CNN's Dr. Sanjay Gupta came to the Brain Chemistry Labs in Jackson Hole to produce a short documentry on our Alzheimer's research.



Dr. Sanjay Gupta & Dr. Paul Alan Cox

SCAN ME

Complimentary Viewing of *Toxic Puzzle* Available



Swedish filmmaker Bo Landin followed our scientists from Jackson Hole to Guam—where neurodegenerative diseases had the highest incidence rate—to Ogimi, Japan where ALS and Alzheimer's are unknown. You can view *Toxic Puzzle* at www.brainchemistrylabs.org or use the QR code.

SCAN ME



Harrison Ford, with Director Bo Landin, narrates *Toxic Puzzle*.

How You Can Help

Your gift can have a significant impact on preventing, diagnosing, and treating brain diseases. Innovative research leading to novel scientific discoveries, combined with tight financial management, means that your gift will have maximum value.

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Brain Chemistry Labs is a 501(c)(3) nonprofit organization.

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