THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM

Office of the Vice President for
Development, Alumni and External Relations

January 11, 2013

The McKnight Brain Research Foundation
c/o Ms. Melanie Cianciotto
Vice President for Foundations and Endowments
SunTrust Bank
200 South Orange Avenue
SOAV 10th Floor
Orlando, Florida 32801

Dear Ms. Cianciotto:

It is my pleasure to present this year's stewardship report for the period ending September 30, 2012, to the Evelyn F. McKnight Brain Research Foundation on behalf of the Evelyn F. McKnight Brain Institute at UAB. The enclosed report follows the format you provided to us.

I am delighted to inform you that the Department of Neurobiology and the McKnight Brain Institute at UAB continue to outperform expectations and we are excited about the progress being made. The Foundation's willingness to lead the way in support of this important work and research has made possible these achievements, and we are thankful for your generosity and partnership with UAB in these endeavors.

If you have any questions or need additional information, please do not hesitate to call Daphne B. Powell, Director of Donor Stewardship, at (205) 934-1807. Please express my gratitude to all of the trustees of the Evelyn F. McKnight Brain Research Foundation.

Sincerely,

Shirley Salloway Kahn, Ph.D.
Vice President for Development,
Alumni and External Relations

SSK/amw

Enclosure

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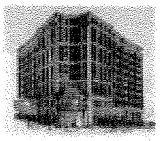
UAB EVELYN F. MCKNIGHT BRAIN INSTITUTE



DEPARTMENT of NEUROBIOLOGY

Annual Report

2012

J. David Sweatt, Ph.D.
Professor
Evelyn F. McKnight Endowed Chair, Department of Neurobiology
Director, Evelyn F. McKnight Brain Research Institute

University of Alabama at Birmingham
Shelby Interdisciplinary Biomedical Research Building
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INSTITUTE DIRECTOR'S OVERALL REPORT

ANNUAL REPORT

McKnight Brain Research Foundation
Report for Evelyn F. McKnight Brain Institute
University of Alabama at Birmingham
October 2011 – September 2012

This report was prepared by Dr. J. David Sweatt as Director of the Evelyn F. McKnight Brain Institute (MBI) and holder of the Evelyn F. McKnight Endowed Chair for Learning and Memory in Aging at The University of Alabama at Birmingham (UAB).

This report provides an overview and summary of the activities and accomplishments for 2012 of the UAB MBI as a whole. The format is as follows. The first section is an executive summary prepared according to the suggested 17-point format provided by the MBRF. The second section is an overall list of the investigators of the UAB MBI. In the third section each UAB MBI investigator with an appointment at the faculty level has prepared his or her own individual annual report for 2012, which is in a shortened and abbreviated format and includes scientific achievements, publications, awards, and collaborations. I also have presented my own individual scientific report as Evelyn F. McKnight Endowed Chair in the final section. The appendices include copies of documents referred to in the summary.

Overview

We are of course deeply grateful that the Evelyn F. McKnight Brain Research Foundation has partnered with UAB to provide support to the MBI through the establishment of a permanent endowment to support the Institute.

Highlights for the past year for the UAB MBI include:

- Overall, McKnight investigators hold appointments across three academic schools (Medicine, Optometry and Arts & Sciences) and seven departments (Neurobiology, Neurology, Vision Science, Psychiatry & Behavioral Neurobiology, Physical Medicine & Rehabilitation, Molecular Cellular & Developmental Biology, and Psychology). A full listing of the investigators is available in *Appendix 1*.
- McKnight Investigator Dr. Lori McMahon was named the Jarman F. Lowder Endowed Professor of Neuroscience last year, an investment by donors and UAB of $500,000 to help retain one of our leading and most active McKnight investigators. Dr. McMahon is also the Associate Director of the UAB Center for Aging and Director of the UAB Comprehensive Neuroscience Center (CNC).
- Dr. Erik Roberson, a McKnight recruit from several years ago and an active McKnight investigator, is being named the Virginia B. Spencer Endowed Professor in Neuroscience, representing an investment by donors and UAB of $500,000 in one of our leading McKnight young investigators.
- A donor has added funds of $1,000,000 to an endowed professorship designated for the UAB MBI. The Warren Family Endowed Chair in Neurology will be used to recruit a new faculty member who will also serve as an MBI investigator.
- The appointments last year of former Neurology Chair Dr. Ray Watts to the Dean's position and McKnight Investigator Dr. David Standaert to the Neurology Chair position continue to promote the strategic emphasis on developing the neurosciences at UAB.

- Neuroscience has been identified as one of six strategic pillars for continued investment as part of the UAB School of Medicine (SOM) five-year strategic plan, which began to be funded and implemented this year.
- McKnight investigators Drs. Standaert and Sweatt continue to serve as co-chairs of the SOM Neuroscience strategic planning committee, working closely with McKnight Investigator Dr. McMahon.
- The neuroscience strategic plan, which was approved by the Dean, calls for recruitment of 25 new neuroscience-related faculty over the next five years.
- Dr. David Sweatt is serving on the search committee to select the next UAB President, assuring MBI and Neuroscience input into the selection process.
- The Department of Neurobiology, from which the Institute is administered, ranked #18 nationally in NIH funding, and the Department of Neurology was ranked #31 nationally (using the most recently available data, for 2011, from the Blue Ridge Institute for Medical Research website). By this metric, these two MBI-affiliated departments are two of the top-performing departments at UAB and nationally. At the individual level, Dr. David Sweatt ranked #35 nationally in total NIH funding among all basic research neuroscientists.
- The Civitan International Research Center (CIRC) based in the Department of Neurobiology continues to receive approximately $500K - $600K per year in spendable support. Much of this is used to support the CIRC fMRI facility, which is used by several McKnight investigators.
- McKnight Investigator Dr. David Sweatt received new grant funding from DARPA (the Defense Advanced Research Projects Agency). This potential alternative source of funding is especially important in today's environment with increased difficulty in obtaining traditional NIH R01 support. The project specifically funds an innovative new nanotechnology-based approach to developing cognitive enhancers relevant to memory improvement in aging-related cognitive decline.
- The MBI co-sponsored a Grant Acceleration Retreat held off campus, which brought together 15 young faculty members with nine of their senior colleagues to provide intensive mentoring and feedback on planned R01 grant applications.
- Neuroimaging is highly relevant to studies of cognitive aging, and UAB and Auburn University have initiated a collaboration to facilitate large-scale neuroimaging projects using Auburn's 7T magnet. The first annual UAB/Auburn retreat was held in July 2012. As a result of this retreat, several new neuroimaging collaborations are underway with anticipated grant applications early next year.
- In terms of training physician-scientists, a new R25 training program was funded (R25 NS079188-01, Standaert, PI) for intensive lab-based research training for selected residents in Neurology, Neurosurgery, and Neuropathology.
- Three Neuroscience T32 Training Grants were submitted May 2012, in the areas of general neuroscience, cognition, and neuro-oncology. The PI's are Drs. Lori McMahon, David Sweatt, and Tika Benveniste, respectively.
- A newly renovated brain biobank facility located in the autopsy area of the UAB Hospital will facilitate autopsy brain collection, cutting and storage. Funding is from the UAB Hospital, SOM and Department of Pathology.
- A Neurodegeneration Symposium will be held at UAB March 29, 2013. While still in the planning stages, five outside speakers have already been scheduled. In addition, a Neurodegeneration Retreat at the UAB National Alumni Society House sponsored by the Center for Neurodegeneration and Experimental Therapeutics and the CNC was held this year with two outside speakers.

Challenges over the last year:

- Recruitment is progressing more slowly than expected. Failures in attracting outstanding candidates to UAB are most often related to spouse/family issues, and some general reluctance to move in a sluggish economy.
- For the last five years UAB was the recipient of a large NIH Blueprint Grant that funded cores, three of which were located in the MBI. Unfortunately this mechanism has been discontinued by the NIH, and an effort to obtain replacement P30 funding was not successful (likely because UAB already has another neuroscience P30 award—it would have been unprecedented for UAB to hold two NINDS P30 Core awards simultaneously). Most of the existing facilities are moving towards a fee-for-service model, but this is an added burden on existing grants. The MBI continues to fund the Synaptic Physiology Core that was previously supported by the P30, allowing McKnight investigators continued access to these services *at no charge*.

1. Summary of Scientific Achievements since Last Report

As mentioned above, individual McKnight investigators' scientific accomplishments are noted in a separate section. The next few paragraphs highlight a few of the principal discoveries from the MBI this year.

In a collaborative project between the laboratories of McKnight investigators Drs. Farah Lubin and Lori McMahon, studies demonstrated a role for histone methylation in learning and memory, a rapidly emerging subfield of great relevance to cellular aging. It is known that learning triggers alterations in gene transcription in brain regions such as the hippocampus and the entorhinal cortex (EC) that are necessary for long-term memory (LTM) formation. The Lubin laboratory worked with the McMahon group to identify an essential role for the G9a/G9a-like protein (GLP) lysine dimethyltransferase complex and the histone H3 lysine 9 dimethylation (H3K9me2) marks it catalyzes, in the transcriptional regulation of genes in area CA1 of the rat hippocampus and the EC during memory consolidation. They found that spatial learning increased global levels of H3K9me2 in area CA1 and the EC, with observable changes at the Zif268, DNMT3a, BDNF exon IV, and cFOS gene promoters, which occurred in concert with mRNA expression. Several of these genes have been previously implicated as being disregulated in aging. Lubin and McMahon found that inhibition of G9a/GLP in the EC, but not in the hippocampus, enhanced contextual fear conditioning relative to control animals. The inhibition of G9a/GLP in the EC induced several histone modifications that include not only methylation but also acetylation. In addition, synaptic plasticity studies at two distinct EC-CA1 cellular pathways revealed that G9a/GLP activity is critical for hippocampus-dependent long-term potentiation initiated in the EC via the perforant pathway but not the temporoammonic pathway. Together, these data demonstrate that G9a/GLP differentially regulates gene transcription in the hippocampus and the EC during memory consolidation. Furthermore, these findings support the possibility of a role for G9a/GLP in the regulation of cellular and molecular cross talk between these two brain regions during LTM formation. These studies, which were published in *The Journal of Neuroscience*, indicate that manipulation of histone methylation may offer a strategy to reduce the levels of aberrant gene transcription associated with aging.

McKnight investigators Drs. Jacques Wadiche and Linda Overstreet-Wadiche collaboratively published their discovery of an important new mechanism for regulating synaptic function in the

cerebellum, a finding which has significant implications for synaptic plasticity in the CNS. Their paper describing these results was published in one of the top journals in the field of neuroscience, *The Journal of Neuroscience*. In their studies they focused on synaptic function at "parallel fiber" (PF) synapses at Purkinje neurons. In the CNS, excitatory amino acid transporters (EAATs) localized to neurons and glia terminate the actions of synaptically released glutamate. Whereas glial transporters are primarily responsible for maintaining low ambient levels of extracellular glutamate, neuronal transporters have additional roles in shaping excitatory synaptic transmission. In their studies they tested the hypothesis that the expression level of the Purkinje cell (PC)-specific transporter, EAAT4, near PF release sites controls the extrasynaptic glutamate concentration transient following synaptic stimulation. Using EAAT4 promoter-driven eGFP reporter mice together with pharmacology and genetic deletion, they showed that the level of neuronal transporter expression influences extrasynaptic transmission from PFs to adjacent Bergmann glia (BG). These results demonstrate that physiological regulation of neuronal transporter expression can alter extrasynaptic neuroglial signaling. Overall, these mechanisms help to regulate the gating of information into and out of the cerebellar cortex, an area critically important for certain types of long-term memory formation.

Finally, a collaborative group of three different McKnight Investigators, Drs. Scott Wilson, Lynn Dobrunz, and Erik Roberson. published a novel finding this year in the journal *PLOS One*. In this series of studies they made the surprising discovery that the ubiquitin protein regulatory pathway is a regulator of the key neurodegeneration-associated protein *tau*. Regulated protein degradation by the proteasome plays an essential role in the enhancement and suppression of signaling pathways in the nervous system. Proteasome-associated factors are pivotal in ensuring appropriate protein degradation, and the Wilson lab had previously demonstrated that alterations in one of these factors, the proteasomal deubiquitinating enzyme ubiquitin-specific protease 14 (Usp14), can lead to proteasome dysfunction and neurological disease. Recent studies in cell culture had shown that Usp14 can also stabilize the expression of over-expressed, disease-associated proteins such as tau and ataxin-3. Using Usp14-deficient ax(J) mice, Wilson, Dobrunz, and Roberson investigated if loss of Usp14 results in decreased levels of endogenous tau and ataxin-3 in the nervous system of mice. Although loss of Usp14 did not alter the overall neuronal levels of tau and ataxin-3, they found increased levels of phosphorylated tau that correlated with the onset of axonal varicosities in the Usp14-deficient mice. These changes in tau phosphorylation were accompanied by increased levels of activated phospho-Akt, phosphorylated MAPKs, and inactivated phospho-GSK3β. Their studies demonstrate that due to the widespread activation of intracellular signaling pathways induced by the loss of Usp14, a better understanding of the cellular pathways regulated by the proteasome is required before effective proteasomal-based therapies can be used to treat chronic neurological diseases.

2. Publications in Peer Reviewed Journals

Investigators at the UAB MBI published a total of 80 research papers, reviews and commentaries in peer-reviewed journals in 2012. The journals in which these papers were published included many of the leading scientific journals in the discipline of neuroscience: *Nature Neuroscience, Neurobiology of Aging, Journal of Neuroscience, JBC, J. Neurophys, J. Neurochemistry,* etc.

3. **Publications (Other)**

- **Books**
  Dr. David Sweatt is the lead editor on a book in press: *Epigenetic Regulation in the Nervous System; Basic Mechanisms and Clinical Impact*. The volume will be published by Elsevier in February 2013.

- **Book Chapters**
  Investigators at the UAB MBI published a total of 22 book chapters in 2012.

4. **Presentations at Scientific Meetings (Also Includes Invited Research Seminars)**

Investigators at the UAB MBI presented a total of 38 scientific presentations in 2012. UAB MBI investigators presented their work at numerous prestigious institutions, including UT Southwestern Medical Center, UCLA, the American College of Neuropsychopharmacology, and DARPA. MBI investigators also presented their work at prominent national meetings including those sponsored by the Society for Neuroscience, Molecular and Cellular Cognition Society, National Parkinson's Foundation, and Neurochemistry Society.

In addition, the UAB MBI sponsored a number of prominent scientists to visit UAB and the MBI to give research presentations concerning their own work. A list of MBI-sponsored speakers for 2012 is appended to this report.

5. **Presentations at Public (Non-Scientific) Meetings or Events**

Investigators at the UAB MBI presented seven public-forum presentations in 2012. Dr. David Sweatt was interviewed live for NPR's *Science Friday*, where he discussed the role of epigenetic mechanisms in memory and memory dysfunction.

6. **Awards and Honors**

McKnight Investigator Dr. Lori McMahon was named the Jarman F. Lowder Professor of Neuroscience on June 15, 2012. Dr. McMahon is also the Associate Director of the UAB Center for Aging and Director of the UAB CNC.

McKnight Investigator Dr. Erik Roberson will be named the Virginia B. Spencer Endowed Professor in Neuroscience in February 2013.

Investigators at the UAB MBI received several national-level awards and honors in 2012. Dr. Sweatt was the recipient of the 2012 Foundation IPSEN International Prize in Neural Plasticity (shared with Michael Meaney and Catherine Dulac), one of the highest international awards in the area of learning and memory. Dr. Sweatt was also appointed to the National Advisory Mental Health Council (NIMH Council) for the period 2012-2016. Eleven MBI faculty members served on NIH Study Sections, and five faculty members served as journal editors or on editorial boards.

7. Faculty

As a result of philanthropic gifts to the institution, there are two vacant endowed chairs that are currently housed in the Department of Psychiatry & Behavioral Neurobiology, the *Geropsychiatry Research Chair* and the *F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry.* The market share of each endowment exceeds $1.5 million, and both are available for the recruitment of senior level, star-quality faculty engaged in the investigation and treatment of memory disorders in the elderly. The department's chair and members of the UAB MBI steering committee have agreed to utilize proceeds from both endowments and future memory research-related endowments in Neurology and Psychiatry for future UAB-MBI recruitments. Recruited faculty will receive joint appointments in Psychiatry and Neurology and will also be appointed MBI investigators.

The two searches for the Kinney Chair and the Geropsychiatry Chair are currently ongoing, with two new candidates visiting this fall and next spring. Outstanding faculty candidates have been identified for each of the two open chair positions. However, at this stage the potential recruits prefer to have their identities kept confidential, as is typical in the case of senior-level recruitments of this sort.

Please note that last year (2011) the Collat Endowment in Neuroscience, based in Neurology, was used for the recruitment of MBI Investigator Dr. David Geldmacher. Dr. Geldmacher is the Director of the new Division of Memory Disorders, and his work focuses on clinical studies of cognition in aging. We are of course very excited to have Dr. Geldmacher on board at UAB to help us further strengthen our clinically based studies.

In the area of radiology and brain imaging, an offer has been made to Dr. Bob Kessler, a clinician-scientist neuro-radiologist and PET imager from Vanderbilt. In addition, in Neurology search committees have been working on endowed chairs in PD and AD (Strain and Warren Chairs, respectively). There were four on-site interviews in a first round, but none successful. We are starting a new round of interviews now.

Ongoing Primary Recruitment Based in the MBI:

As part of the new strategic plan for the SOM, the Dean approved an additional new recruitment as part of the MBI endeavor for 2012/2013. Thus we are undertaking a targeted recruitment in the area of neuro-epigenetics and cognitive function and plan to recruit an associate/full professor, NIH-funded investigator for this position. Marcelo Wood (UC Irvine) was our first "target," but unfortunately his family situation has made him un-movable.

After discussion with Mary-Ann Bjornsti in Pharm/Tox in moving forward with this recruitment, we are going to go after Paul Kenny as a joint recruitment between Neurobiology and Pharm/Tox. This will also be a McKnight recruitment as well. We propose that this will be a true joint recruit with dual primary appointments in both departments. Paul Kenny is an outstanding scientist and future star, focusing on work in the areas of epigenetics, memory and cognition, neuropharmacology, metabolism and feeding behavior, and reward mechanisms in the brain. He would fill a unique niche at the interface of cognition, pharmacology, and endocrine function, and bridge between Pharm, Neuro, and the Diabetes Center. Paul is funded by multiple NIH grants and has already been to UAB once (this

spring) and is definitely interested in entertaining the possibility of a move. He is currently at Scripps Florida, where he is required to cover 100% of his salary from grants.

It is possible that we might bring in Paul as the head of a new Division of Neuropharmacology. We plan to bring Paul for a visit in early 2013. While this is a targeted recruitment, we also will have a search committee involved, which will include John Hablitz, Farah Lubin, and Erik Roberson at a minimum. We plan to have the recruitment finalized by mid-2013.

Regarding resources for this commitment, the Dean has allocated the funds previously committed for Marcelo Wood to the Kenny recruitment. We anticipate this commitment will include an endowed professorship of $500K and $750K for start-up. This would be leveraged by funds through the Pharm/Tox Department as well, and by the MBI.

8. Trainees, Post Doctoral, Pre-Doctoral, Other

A. The labs of MBI faculty currently involve the training of 38 graduate students and 15 post-doctoral fellows.

B. Recruiting Initiatives for 2013
As described above we will continue ongoing searches for senior-level MBI investigators, several with an endowed position, in 2013. In addition as described above, as part of the new strategic plan for the SOM, the Dean has approved an additional new recruitment as part of the MBI endeavor for 2013. We are undertaking a targeted recruitment in the area of neuro-epigenetics and cognitive function and plan to recruit an associate/full professor, NIH-funded investigator for this position.

9. Clinical/Translational Programs

A. New Programs
The recruitment of Dr. Geldmacher was described above, so these new initiatives in the clinical/translational area will not be reiterated here.

In addition, Dr. Sweatt's new DARPA project is translational, relating to novel constructs for cognitive enhancement.

B. Update on Existing Clinical Studies
Not applicable

C. New Treatments
Not applicable

D. Drug Trials, Future Research and/or Clinical Initiatives

Dr. Harry Sontheimer's laboratory is executing a new clinical trial for the use of sulfasalazine in glioblastoma-related epileptogenesis, funded by the UAB CNC. This exciting new avenue of clinical research is based on Sontheimer's recent discovery of the utility of this approach in animal studies, which were published in *Nature Medicine*.

10. Technology

A. Patent Applications

Not applicable

B. Revenue Generated from Technology

Not applicable

11. Budget Update

A full financial report for 2011/2012 is included as Section 2.

12. Educational Programs Focusing on Age-Related Memory Loss

A. Scientific

The MBI was instrumental in establishing a new undergraduate honors neuroscience major at UAB. It is the only program of its kind in the country—a joint offering between the undergraduate College of Arts and Sciences and the SOM. This will be a recruiting platform for future medical and graduate students interested in memory research. For example, several of our 2011/2012 graduates from this program are currently in (or applying to) medical school or MD/PhD programs at UAB.

B. Public

Not applicable

13. Collaborative Programs with other McKnight Institutes, Institutions and Research Programs

UAB MBI investigators have identified a total of 13 inter- and intra-MBI collaborations, representing all three other MBIs. More details on these collaborations are noted in the section with the individual investigators' data.

14. Collaborative Programs with Non McKnight Institutes, Institutions and Research Programs

UAB MBI investigators have identified a total of 85 inter- and intra-institutional collaborations locally, nationally, and internationally.

15. Were any funds used for a Prohibited Purpose during the report period?

No

16. Do you recommend any modification to the Purpose or mandates in the Gift Agreement?

None

17. Did all activities during the report period further the Purpose?

Yes

18. Briefly describe your progress compared to the original goals.

The UAB MBI is progressing in accordance with the original strategic plan for the Institute, which was outlined to the MBRF Board when the UAB MBI was approved for renewed funding in 2009. We have focused on recruiting new faculty members as was originally proposed. The quality of the new investigators has been uniformly excellent. The current membership of the UAB MBI comprises 27 investigators, with a nicely diverse distribution of assistant, associate, and full professors including four department chairs. Approximately two-thirds (18/27) of the investigators are new appointees to the MBI since 2006, an exceptional expansion given the state of the economy over that time-frame.

Another exciting development over the 2011 funding period was that the Dean, Dr. Ray Watts, was recruited from within UAB, and this ensures continuity of UAB programmatic initiatives. Dr. Watts has assured me that all UAB commitments to the MBI will be honored and upheld throughout the transition and beyond. Dr. Watts is a strong supporter of the Institute and plans to continue to emphasize the neurosciences as a strategic priority for the SOM. As described above, he was previously Chair of the Department of Neurology at UAB.

Also described above, as part of the new strategic plan for the SOM, Dean Watts has approved an additional new recruitment as part of the MBI endeavor for 2013. We are undertaking a targeted recruitment in the area of neuroepigenetics and cognitive function and plan to recruit an associate/full professor, NIH-funded investigator for this position. We anticipate that the Dean's office will generate a new endowed professorship to enhance this recruitment opportunity.

We also are progressing nicely in developing our research infrastructure as planned. The eleventh floor of the Shelby Building, i.e., the final third of the MBI physical plant was completed, and we have begun occupancy with Drs. Roberson and Lubin occupying new labs there. Both the Neurology and Pharmacology departments are undertaking collaborative recruitments with the MBI to recruit additional new MBI-relevant professors into the MBI eleventh floor. Drs. Gwen King and Scott Phillips, the newest additions to the MBI faculty, have established their research programs on the ninth floor of the MBI. Two important Core laboratories, the *MBI Mouse Behavioral Assessment Core* and the *MBI/NIH Blueprint Rodent Physiological Assessment Core*, are in operation and provide an excellent platform for inter-Institute collaborations. These two Cores provide excellent opportunities for expanded expertise among UAB MBI investigators in utilizing cutting-edge genetically engineered mouse models relevant to cognitive aging. In addition, these two Cores capitalize on scientific strengths of the UAB MBI and allow for collaborative opportunities with the other MBIs, which in general are not historically strong in the area of mouse genetic engineering.

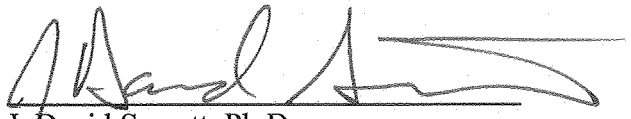
19. Please describe any negative events (loss of personnel, space, budget, etc.) that occurred during the report period and the possible impact on carrying out the Gift Agreement.

None

20. Please provide any general comments or thoughts not covered elsewhere – a response is not required. Please respond only if you would like to add something not otherwise covered elsewhere.

No additional comments.

21. Signature, date, and title of person submitting report



1/11/13

J. David Sweatt, Ph.D.
Professor
Evelyn F. McKnight Endowed Chair
Director, Evelyn F. McKnight Brain Institute
Chairman, Department of Neurobiology
UAB School of Medicine

Date

FINANCE

McKnight Brain Research Foundation

Financial Summary Format:

(Institute) and/or (Endowed Chair)

Summary for 12 months ended 09/30/12

Account Name: Evelyn F. McKnight Brain Institute Endowed Support Fund

	Beginning Balance on 10/01/2011	$ 1,844,489
B.	Investment Growth	$ 116,118
C.	Distributions	$ 145,708
D.	Additional Contribution	$ 1,000,000
E.	Ending Balance on 09/30/2012	$ 3,106,315

DEFINITIONS

DISTRIBUTION is the money transferred from the account to the spendable/operating account for the designated use.

BALANCE is the market value of the account as of the first or last day of the reporting year.

ADDITIONAL CONTRIBUTION is additional contribution by MBRF, the reporting institution, match etc.

INVESTMENT GROWTH (Loss) is the total undistributed interest, dividends, and realized and unrealized gains and losses.

BALANCE is the value of the account's corpus including all contributions, and applicable state match monies as of the date indicated.

McKnight Brain Research Foundation

Financial Summary Format:

(Institute) and/or (Endowed Chair)

Summary for 12 months ended 09/30/12

Account Name: Evelyn F. McKnight Endowed Chair for Learning and Memory in Aging

	Beginning Balance on 10/01/2011	$ 1,346,656
B.	Investment Growth	$ 18,719
C.	Distributions	$ 73,369
D.	Additional Contribution	$ 0
E.	Ending Balance on 09/30/2012	$ 1,438,744

DEFINITIONS

DISTRIBUTION is the money transferred from the account to the spendable/operating account for the designated use.

BALANCE is the market value of the account as of the first or last day of the reporting year.

ADDITIONAL CONTRIBUTION is additional contribution by MBRF, the reporting institution, match etc.

INVESTMENT GROWTH (Loss) is the total undistributed interest, dividends, and realized and unrealized gains and losses.

BALANCE is the value of the account's corpus including all contributions, and applicable state match monies as of the date indicated.

MCKNIGHT BRAIN INSTITUTE AT UAB
2012 ANNUAL REPORT
FINANCIAL SUPPLEMENT

In compliance with Section 6.3 of the gift agreement between the Evelyn F. McKnight Brain Research Foundation (MBRF) and UAB, this income and distributions report is provided as a supplement to the annual report on the McKnight Brain Institute (MBI) at UAB.

In compliance with Sections 9.2.1.2 and 10.3 of said gift agreement, UAB ensures that the contributions from the MBRF and the distributions from the endowed chair have been used solely for the purpose of promoting research and investigation of the brain in the fundamental mechanisms that underlie the neurobiology of memory with a clinical relevance to the problems of age-related memory loss.

In compliance with Sections 7, and 9.1.5.3, of said gift agreement, UAB ensures that no portion of the contributions received from the MBRF or distributions from the endowed chair were used directly or indirectly to construct, purchase, improve, or maintain real property; to pay overhead or indirect costs; or for anything other than direct expenditures in furtherance of the purpose of the fund.

Fiscal Year	Item	MBRF Deposits	MBRF Chair, Gift and Endowment Distributions **	MBRF Funds Expended or Encumbered	Matching Funds Expended or Encumbered Endowment Distributions	Matching Funds Expended or Encumbered
Grand Totals	**MBRF Prior Agreement**	**$ 6,000,000**	**$ 598,150**	**$ 5,911,757**	**$ -**	**$ 12,357,436**
2010	**MBRF New Agreement**	**$ 1,000,000**		$ 1,000,000		
		$ 500,000				
	Sweatt Salary			$ 81,617		
	Rumbaugh Salary			$ 26,966		
	L.Wadiche Salary			$ 72,485		
	J. Wadiche Salary			$ 78,526		
	V. Parpura Salary			$ 156,829		
	K. Visscher Salary			$ 117,192		
	R. Lester Salary			$ 12,594		
	F. Lubin Salary			$ 11,677		
	J. Hablitz Salary			$ 30,723		
	K. Speed Salary			$ 24,455		
	V. Hixon Salary			$ 6,734		
	I. Rivera Salary			$ 4,851		
	M. Kilgore Salary			$ 26,245		
	One Pilot Project			$ 25,000		
	Evelyn F. McKnight Interdisciplinary Retreat			$ 10,808		$ 4,000
	V. Hixon and M. Kilgore Travel			$ 2,833		
	M. Olsen Start Up Package					$ 756,000
	G. King Start Up Package			$ 35,000		$ 665,000
	F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry *				$ 74,014	$ 1,500,050
	Geropsychiatry Research Chair*				$ 102,544	$ 1,222,896
	Patsy W. and Charles A. Collat Scholar in Neuroscience - D. Geldmacher*					$ 500,000
	Dixon Scholar in Neurology - M. Gray					$ 245,000
	Parpura Start Up Package			$ 40,000		
	F. Lubin Start Up Package			$ 8,750		
	J. Wadiche Start Up Package			$ 55,000		
	L. Wadiche Start Up Package			$ 10,000		
	MBRF Chair Spendable Earnngs		$ 83,499			

MCKNIGHT BRAIN INSTITUTE AT UAB
2012 ANNUAL REPORT
FINANCIAL SUPPLEMENT

Fiscal Year	Item	MBRF Deposits	MBRF Chair, Gift and Endowment Distributions **	MBRF Funds Expended or Encumbered	Matching Funds Expended or Encumbered Endowment Distributions	Matching Funds Expended or Encumbered
	MBRF Gift Earnings**		$ 61,169			
	MBRF Institute Spendable Earnings		$ 55,984			
	Previous MBRF Agreement Residual		$ 409,277			
FY 10 Totals		**$ 1,500,000**	**$ 609,929**	**$ 1,838,285**	**$ 176,558**	**$ 4,892,946**
2011	**MBRF New Agreement**	**$ 1,000,000**		$ 1,000,000		
		$ 500,000				
	Sweatt Salary			$ 74,605		
	L.Wadiche Salary			$ 74,297		
	J. Wadiche Salary			$ 80,489		
	V. Parpura Salary			$ 156,829		
	K. Visscher Salary			$ 103,503		
	F. Lubin Salary			$ 55,208		
	J. Hablitz Salary			$ 30,723		
	K. Speed Salary			$ 12,505		
	V. Hixon Salary			$ 6,532		
	S. Hyman Salary			$ 4,924		
	G. Kass Salary			$ 12,469		
	S. Ewell Salary			$ 6,417		
	Evelyn F. McKnight Interdisciplinary Retreat			$ 10,483		$ 5,000
	F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry*				$ 67,724	
	Geropsychiatry Research Chair*				$ 93,795	
	Warren Family Scholar*					$ 600,000
	Patsy W. and Charles A. Collat Scholar in Neuroscience - D. Geldmacher*					$ 300,000
	S. Phillips Development Grant					$ 10,000
	SOM Additional Support					$ 50,000
	Parpura Start Up Package			$ 25,000		
	J. Wadiche Start Up Package			$ 11,760		
	L. Wadiche Start Up Package			$ 13,290		
	A. Theibert - Support			$ 15,000		
	R. Lester - Support			$ 20,000		
	MBRF Chair Spendable Earnings		$ 79,969			
	MBRF Gift Earnings**		$ 59,606			
	MBRF Institute Spendable Earnings		$ 100,316			
	Previous MBRF Agreement Residual		$ 317,881			
FY 11 Totals		**$ 1,500,000**	**$ 557,772**	**$ 1,714,034**	**$ 161,519**	**$ 965,000**
2012	**MBRF New Agreement**	**$ 1,000,000**		$ 1,000,000		
	Sweatt Salary			$ 74,432		
	L.Wadiche Salary			$ 77,984		
	J. Wadiche Salary			$ 81,004		

MCKNIGHT BRAIN INSTITUTE AT UAB
2012 ANNUAL REPORT
FINANCIAL SUPPLEMENT

Fiscal Year	Item	MBRF Deposits	MBRF Chair, Gift and Endowment Distributions **	MBRF Funds Expended or Encumbered	Matching Funds Expended or Encumbered Endowment Distributions	Matching Funds Expended or Encumbered
	V. Parpura Salary			$ 153,611		
	K. Visscher Salary			$ 89,463		
	F. Lubin Salary			$ 93,245		
	J. Hablitz Salary			$ 30,092		
	K. Speed Salary			$ 13,601		
	V. Hixon Salary			$ 6,528		
	G. King Salary			$ 33,836		
	S. Ewell Salary			$ 14,917		
	Evelyn F. McKnight Interdisciplinary Retreat			$ 11,938		$ 3,062
	F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry*				$ 65,269	
	Geropsychiatry Research Chair*				$ 90,396	
	Warren Family Scholar*				$ 39,775	$ 1,000,000
	Jarman F. Lowder Endowed Professorship in Neuroscience - L. McMahon*				$ 25,723	$ 505,519
	Virginia B. Spencer Endowed Professorship in Neuroscience - E. Roberson*				$ 24,041	$ 500,000
	Patsy W. and Charles A. Collat Scholar in Neuroscience - D. Geldmacher*				$ 14,125	
	L. Dobrunz - CCTS Pilot Project					$ 15,000
	SOM Additional Support					$ 50,000
	Evelyn F. McKnight Advertisement			$ 4,463		
	L. Dobrunz - Pilot Project			$ 52,000		
	A. Theibert - Support			$ 10,000		
	R. Lester - Support			$ 5,000		
	D. Sweatt - Travel			$ 771		
	V. Hixon - Travel			$ 1,214		
	MBRF Chair Spendable Earnngs		$ 73,369			
	MBRF Gift Earnings**		$ 6,546			
	MBRF Institute Spendable Earnings		$ 145,708			
	Previous MBRF Agreement Residual		$ 174,079			
FY 12 Totals		**$ 1,000,000**	**$ 399,702**	**$ 1,754,099**	**$ 259,329**	**$ 2,073,581**
Grand Totals		**$ 4,000,000**	**$ 1,567,403**	**$ 5,306,418**	**$ 597,406**	**$ 5,857,946**
	* Denotes encumbered endowment match					
	** Original MBRF gift was set up as an interest bearing account. These items account for the interest over time ($279,608 in the prior agreement and $127,321 in the current agreement).					

MCKNIGHT BRAIN INSTITUTE AT UAB
2012 ANNUAL REPORT
FINANCIAL SUPPLEMENT

Financial Schedule for the Evelyn F. McKnight Brain Institute at UAB

	MBRF CONTRIBUTION		*UAB MATCH*		
Date	**Endowment**	**Operations**	**Endowment**	**Operations**	**Endowment Distribution**
10/1/2009	$ 1,000,000	$ 500,000	$ 2,722,946	$ 2,170,000	$ 316,041
10/1/2010	$ 1,000,000	$ 500,000	$ -	$ 365,000	$ 341,804
10/1/2011	$ 1,000,000		$ 500,000	$ 100,000	$ 480,918
10/1/2012	$ 1,000,000		$ 2,005,519	$ 65,000	
10/1/2013					
Total	**$ 4,000,000**	**$ 1,000,000**	**$ 5,228,465**	**$ 2,700,000**	**$ 1,138,763**

Projected FY 12-13 Evelyn F. McKnight Brain Institute Budget					
Category	**McKnight Operations Amount**	**McKnight Endowment Spendable Earnings Amount**	**McKnight Endowed Chair Spendable Earnings Amount**	**UAB Encumbered Endowment Spendable Earnings Amount**	**Totals**
Salary and Benefits	$0	$149,769	$71,820		**$221,589**
Other McKnight Brain Institute Support					**$0**
F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry				$65,269	**$65,269**
Geropsychiatry Research Chair				$90,396	**$90,396**
Warren Chair				$39,775	**$39,775**
Lowder Chair				$25,723	**$25,723**
Collat Chair				$14,125	**$14,125**
Spencer Chair				$24,041	**$24,041**
Total	**$0**	**$149,769**	**$71,820**	**$259,329**	**$480,918**

Department of Neurobiology/Evelyn F. McKnight Brain Institute
Extramural Funding Report

The Department of Neurobiology/Evelyn F. McKnight Brain Institute currently has active extramural funding of $6,182,873 in direct costs and $8,152,240 in total costs broken down as follows:

NIH	$5,230,458 Direct Costs
NSF	$ 174,189 Direct Costs
DARPA	$ 340,690 Direct Costs
Other Foundations	$ 437,536 Direct Costs
Total	$6,182,873 in Direct Costs

A detailed report of grant awards is attached.

In compliance with Section 6.3 of the gift agreement between the Evelyn F. McKnight Brain Research Foundation (MBRF) and UAB, this income and distributions report is provided as a supplement to the annual report on the McKnight Brain Institute (MBI) at UAB.

In compliance with Sections 9.2.1.2 and 10.3 of said gift agreement, UAB ensures that the contributions from the MBRF and the distributions from the endowed chair have been used solely for the purpose of promoting research and investigation of the brain in the fundamental mechanisms that underlie the neurobiology of memory with a clinical relevance to the problems of age-related memory loss.

In compliance with Sections 7, and 9.1.5.3, of said gift agreement, UAB ensures that no portion of the contributions received from the MBRF or distributions from the endowed chair were used directly or indirectly to construct, purchase, improve, or maintain real property; to pay overhead or indirect costs; or for anything other than direct expenditures in furtherance of the purpose of the fund.

Fiscal Year	Item	MBRF Deposits	MBRF Chair, Gift and Endowment Distributions	MBRF Funds Expended or Encumbered	Matching Fund Expended or Encumbered Endowment Distributions	Matching Funds Expended or Encumbered
Grand Totals	**MBRF Prior Agreement**	**$6,000,000**	**$ 598,150**	**$ 5,911,757**	**$ -**	**$ 12,357,436**
2010	**MBRF New Agreement**	**$1,000,000**		$ 1,000,000		
		$500,000				
	Sweatt Salary			$ 81,617		
	Rumbaugh Salary			$ 26,966		
	L.Wadiche Salary			$ 72,485		
	J. Wadiche Salary			$ 78,526		
	V. Parpura Salary			$ 156,829		
	K. Visscher Salary			$ 117,192		
	R. Lester Salary			$ 12,594		
	F. Lubin Salary			$ 11,677		
	J. Hablitz Salary			$ 30,723		
	K. Speed Salary			$ 24,455		
	V. Hixon Salary			$ 6,734		
	I. Rivera Salary			$ 4,851		
	M. Kilgore Salary			$ 26,245		
	One Pilot Project			$ 25,000		
	Evelyn F. McKnight Interdisciplinary Retreat			$ 10,808		$ 4,000
	V. Hixon and M. Kilgore Travel			$ 2,833		
	M. Olsen Start Up Package					$ 756,000

	G. King Start Up Package			$ 35,000		$ 665,000
	F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry *				$ 74,014	$ 1,500,050
	Geropsychiatry Research Chair *				$ 102,544	$ 1,222,896
	Patsy W. and Charles A. Collat Scholar in Neuroscience - D. Geldmacher					$ 500,000
	Dixon Scholar in Neurology - M. Gray					$ 245,000
	Parpura Start Up Package			$ 40,000		
	F. Lubin Start Up Package			$ 8,750		
	J. Wadiche Start Up Package			$ 55,000		
	L. Wadiche Start Up Package			$ 10,000		
	MBRF Chair Spendable Earnings		$83,499			
	MBRF Gift Earnings		$61,169			
	MBRF Institute Spendable Earnings		$55,984			
	Previous MBRF Agreement Residual		$409,277			
FY 10 Totals		**$1,500,000**	**$609,929**	**$ 1,838,285**	**$ 176,558**	**$ 4,892,946**
2011	**MBRF New Agreement**	**$1,000,000**		$ 1,000,000		
		$500,000				
	Sweatt Salary			$ 74,605		
	L.Wadiche Salary			$ 74,297		
	J. Wadiche Salary			$ 80,489		
	V. Parpura Salary			$ 156,829		
	K. Visscher Salary			$ 103,503		
	F. Lubin Salary			$ 55,208		
	J. Hablitz Salary			$ 30,723		
	K. Speed Salary			$ 12,505		
	V. Hixon Salary			$ 6,532		
	S. Hyman Salary			$ 4,924		
	G. Kass Salary			$ 12,469		
	S. Ewell Salary			$ 6,417		
	Evelyn F. McKnight Interdisciplinary Retreat			$ 10,483		$ 5,000
	F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry *				$ 67,724	

	Geropsychiatry Research Chair *			$ 93,795	
	Warren Family Scholar				$ 600,000
	Patsy W. and Charles A. Collat Scholar in Neuroscience - D. Geldmacher				$ 300,000
	S. Phillips Development Grant				$ 10,000
	SOM Additional Support				$ 50,000
	Parpura Start Up Package		$25,000		
	J. Wadiche Start Up Package		$11,760		
	L. Wadiche Start Up Package		$13,290		
	A. Theibert - Support		$15,000		
	R. Lester - Support		$20,000		
	MBRF Chair Spendable Earnings	$79,969			
	MBRF Gift Earnings	$59,606			
	MBRF Institute Spendable Earnings	$100,316			
	Previous MBRF Agreement Residual	$317,881			
FY 11 Totals	**$1,500,000**	**$557,772**	**$1,714,034**	**$ 161,519**	**$ 965,000**
2012	**MBRF New Agreement**	**$1,000,000**	$1,000,000		
	Sweatt Salary		$74,432		
	L.Wadiche Salary		$77,984		
	J. Wadiche Salary		$81,004		
	V. Parpura Salary		$153,611		
	K. Visscher Salary		$89,463		
	F. Lubin Salary		$93,245		
	J. Hablitz Salary		$30,092		
	K. Speed Salary		$13,601		
	V. Hixon Salary		$6,528		
	G. King Salary		$33,836		
	S. Ewell Salary		$14,917		
	Evelyn F. McKnight Interdisciplinary Retreat		$11,938		$ 3,062
	F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry *			$ 65,269	
	Geropsychiatry Research Chair *			$ 90,396	
	Warren Family Scholar			$ 39,775	$ 1,000,000

	Jarman F. Lowder Endowed Professorship in Neuroscience - L. McMahon				$ 25,723	$ 505,519
	Virginia B. Spencer Endowed Professorship in Neuroscience - E. Roberson				$ 24,041	$ 500,000
	Patsy W. and Charles A. Collat Scholar in Neuroscience - D. Geldmacher				$ 14,125	
	L. Dobrunz - CCTS Pilot Project					$ 15,000
	SOM Additional Support					$ 50,000
	Evelyn F. McKnight Advertisement			$ 4,463		
	L. Dobrunz - Pilot Project			$ 52,000		
	A. Theibert - Support			$ 10,000		
	R. Lester - Support			$ 5,000		
	D. Sweatt - Travel			$ 771		
	V. Hixon - Travel			$ 1,214		
	MBRF Chair Spendable Earnngs		$73,369			
	MBRF Gift Earnings		$6,546			
	MBRF Institute Spendable Earnings		$145,708			
	Previous MBRF Agreement Residual		$174,079			
FY 12 Totals		**$1,000,000**	**$399,702**	**$1,754,099**	**$ 259,329**	**$ 2,073,581**
Grand Totals		**$4,000,000**	**$1,567,403**	**$5,306,418**	**$ 597,406**	**$ 5,857,946**
	* denotes encumbered endowment match					

Department of Neurobiology
Active Extramural Funding
Fiscal Year 2012-2013

Faculty	Role	Percent Effort	Type of Grant and Grant Number	Agency	Grant Period	Title	Current Annual			All Years		
							Direct Costs	F & A	Total	Direct Costs	F & A	Total
Brenner	PI	30%	P01 NS042803	NIH-Wisconsin	07/01/08-06/30/13	Alexander Disease: Cellular and Molecular Mechanisms	154,962	69,733	224,695	774,810	348,665	1,123,475
Brenner	Core Director	10%	P30 HD038985-07	NIH	07/01/08-06/30/13	Intellectual Developmental Disabilities Research Center - Core B	160,297	72,133	232,430	847,472	382,134	1,229,606
Dobrunz	PI	0%	UL1RR025777	CCTS-Internal	05/01/12-04/30/13	Alterations in Neuropeptide Y Release in an Animal Model of Post Traumatic Stress Disorder	60,000	13,950	73,950	60,000	13,950	73,950
Dobrunz	PI	50%	R01 MH098534-01	NIH	07/01/12 - 06/30/17	Interneuron Dysfunction Alters the Dynamics of the Inhibition Excitation Balance	250,000	116,250	366,250	1,250,000	581,250	1,831,250
Hablitz	PI	40%	RO1 NS022373 CR	NIH NINDS	04/01/07-03/31/13 - NCE	Neocortical Epilepsy During Development	218,750	98,438	317,188	1,093,750	492,140	1,585,890
Hablitz	PI	5%	P30 NS047466	NIH NINDS	02/1/11-01/31/16	UAB Neuroscience Core Center	484,149	149,434	225,159	2,420,745	1,125,795	3,546,540
King	PI	75%	R00 AG034989	NIH	07/01/11-06/30/14	Klotho Regulation and Aging	165,418	76,919	242,337	496,320	230,788	727,108
King	Pi	0%	UAB Spore Grant	Spore Pilot Project	10/01/12-09/30/13	Control of Glia Growth and Migration by Klotho	40,000	-	40,000	80,000	-	80,000
Lubin	PI	50%	R01 MH097909-01	NIH	07/01/12-06/30/17	Chromatin Remodeling Mechanisms of Gene Transcription in Memory	262,224	121,934	384,158	1,402,908	676,762	2,079,670
Lubin	PI	0%	Internal Grant	UABHSF	03/01/12-02/28/14	High Resolution Melt Instrument for the Creation of an Epigenetics Research Instrument	26,265	-	26,265	26,265	-	26,265
Parpura, Vladi	PI	8%	New NSF Grant	NSF	09/01/09-08/31/13 - NCE	Cyberplasm - An autonomous Micro-robot constructed using Synthetic Biology	174,189	80,925	255,114	522,567	242,921	765,488
Phillips, Scott	PI	10%	Foundation Grant	ALS Association	08/01/12-07/31/13	Proteasome Activity Enhancement as Treatment for ALS	40,000	-	40,000	40,000	-	40,000

Department of Neurobiology
Active Extramural Funding
Fiscal Year 2012-2013

Faculty	Role	Percent Effort	Type of Grant and Grant Number	Agency	Grant Period	Title	Current Annual			All Years		
							Direct Costs	F & A	Total	Direct Costs	F & A	Total
Pozzo-Miller	PI	20%	R01 NS065027	NIH	02/01/10-01/31/15	MECP2 Mutations and BDNF Signaling: Shared Mechanisms of Rett and Autism	218,750	101,719	320,469	1,093,750	508,595	1,602,345
Pozzo-Miller, I	PI	20%	New R21 Grant	NIH	12/01/12-11/30/14	Reversing BDNF Impairments in Rett Mice with TRPC Channel Activators	175,000	81,375	256,375	275,000	127,875	402,875
Pozzo-Miller	Core Director	20%	P30 HD038985-07	NIH-NICHD	07/01/08-06/30/13	Intellectual Developmental Disabilities Research Center - Core C	151,043	67,969	219,012	859,631	387,618	1,247,249
Pozzo-Miller - LI	PI		Postdoctoral Fellowship	IRSF	01/01/12-12/31/13	A New Approach for Treating Rett Sydrome: Restoration of Interneuron Function by BDNF	45,455	4,545	50,000	90,910	9,090	100,000
Pozzo-Miller -	PI		Postdoctoral Fellowship	IRSF	10/01/11-09/30/13 NCE	UGF 1 And TRKB Agonists as BDNF Mimietics for the Reversal of Dendritic Spine Patholigies And Network Hyperexcitability in the Hippocampus of MECP2 Mutant	45,455	4,545	50,000	45,455	4,545	50,000
Sontheimer	PI		R01 NS036692 CR	NIH NINDS	04/01/08-03/31/13	The Role of Ion Transport in Glioma Cell Migration, Proliferation, and Apoptosis	218,750	98,438	317,188	1,093,750	492,190	1,585,940
Sontheimer	PI		R01 NS031234 CR	NIH NINDS	03/1/07-11/30/12 - NCE	Properties and Function of Glia Ion Channels	218,750	98,438	317,188	875,000	393,752	1,818,750
Sontheimer	PI		R01 NS052634	NIH-NINDS	09/30/11-07/31/16	Amino-acid Transport and the Biology of Human Gliomas	218,750	101,719	320,469	1,093,750	508,595	1,602,345
Sontheimer/ Robel	PI/Mentor		Postdoctoral Fellowship	Epilepsy Foundation	01/01/13-12/31/13	The Role of Astrogliosis in Tumor-Associated Epilepsy	45,000	0	45,000	45,000	-	45,000

Department of Neurobiology
Active Extramural Funding
Fiscal Year 2012-2013

Faculty	Role	Percent Effort	Type of Grant and Grant Number	Agency	Grant Period	Title	Current Annual			All Years		
							Direct Costs	F & A	Total	Direct Costs	F & A	Total
Sontheimer/ Watkins	PI/Mentor		1F31 NS074597	NINDS	12/01/11-11/30/13	Regulation of the Vasculature by Invading Glioma Cells	34,200	0	34,200	102,600	-	102,600
Sontheimer/ Cuddapah	PI/Mentor		NIH	NIH	01/01/11-12/31/13	Regulation of Clc-3 in Human Malignant Glioma	34,200	-	34,200	102,600	-	102,600
Sweatt	PI	40%	R01 MH057014 CR	NIH-NIMH	08/01/10-07/31/15	Biochemical Mechanisms of Long-Term Potentiation	329,920	153,413	483,333	1,649,600	767,065	2,416,665
Sweatt	PI	25%	R01 MH091122	NIH-NIMH	06/03/11-03/31/16	DNA Methylation in Memory Formation	250,000	116,250	366,250	1,250,000	561,250	1,831,250
Sweatt	PI	20%	1R01 NR012686-01	NIH-University of Maryland-Baltimore	9/28/10 - 07/31/15	Epigenetic Modifications of BDNF and trkB Genes Underlie Pain Plasticity	118,739	55,214	173,953	593,695	276,070	869,765
Sweatt	PI	20%	R01 NS013546 CR	NIH-NINDS	04/01/08-03/31/13	Trophic Interaction of Nerve and Muscle	200,900	90,405	291,305	1,025,000	461,250	1,486,250
Sweatt	PI	10%	Exploratory Grant	DARPA	08/01/12-07/31/13	In Vivo Nanoplatforms for Epigenetic Enhancement of Memory	340,690	95,342	436,032	340,690	95,342	436,032
Sweatt	PI	10%	Ellison Foundation	Ellison Foundation	10/01/10-09/30/14	An Epigenetic Hypothesis of Cognitive Aging	150,000	69,750	219,750	600,000	279,000	879,000
Sweatt	PI		T32 NS061788	NINDS	04/01/08-03/31/13	Training Program in the Neurobiology of Cognition and cognitive Disorders	168,400	10,352	178,752	675,440	41,555	716,995

Department of Neurobiology
Active Extramural Funding
Fiscal Year 2012-2013

Faculty	Role	Percent Effort	Type of Grant and Grant Number	Agency	Grant Period	Title	Current Annual			All Years		
							Direct Costs	F & A	Total	Direct Costs	F & A	Total
Sweatt	PI		Foundation Grant	Simons Foundation	08/01/12-07/31/13	Understanding the Basic Neurobiology of Pitt-Hopkins Syndrome	50,000	10,000	60,000	50,000	10,000	60,000
Sweatt/Day	PI/Mentor		1 F32DA029419	NIH-NIDA	07/01/10-06/01/13	Epigenetic Control of Reward Learning	47,606		47,606	148,974		148,974
Sweatt/Sultan	PI/Mentor		New NRSA	NIH	01/01/12-12/31/13	The Role of DNA Demethylation by Gadd45b in Memory and Synaptic Plasticity	34,200	-	34,200	102,600	-	102,600
Visscher, Kristina	PI	15%	Foundation Grant	Dana Foundation	01/01/11-12/31/13	Age-Related Macular Degeneration: The Effect of Training on Visusal Performance and Neural Activity	85,361	-	85,361	199,542	-	199,542
Wadiche, Jaqcues	PI	35%	R01 NS065920	NIH-NINDS	06/01/09-05/31/14	Timing of Neurotransmitter Release	218,750	101,354	320,104	1,093,750	506,770	1,600,520
Wadiche, Linda	PI	40%	R01 NS064025	NIH	02/01/09-01/31/14	Newborn Neurons in the Adult Hippocampal Network	218,750	98,438	317,098	1,093,750	492,188	1,585,938

Department of Neurobiology
Active Extramural Funding
Fiscal Year 2012-2013

Faculty	Role	Percent Effort	Type of Grant and Grant Number	Agency	Grant Period	Title	Current Annual			All Years		
							Direct Costs	F & A	Total	Direct Costs	F & A	Total
Wadiche, Linda/ Chancey	PI/Mentor		New F31 Grant	NIH-NINDS	01/01/12-12/31/13	Experience-Dependent Synaptogenesis in Adult Generated Neurons	34,200	-	34,200	102,600	-	102,600
Wilson	PI	50%	R01 NS047533	NIH	02/1/10-12/31/14 -	The Role of Usp 14 in Regulating Neuronal Function	218,750	101,719	320,469	1,093,750	508,595	1,602,345
Wilson, Scott	PI		1R21 NS074456	NIH-NINDS	09/01/11 - 08/31/13	Enhancement of Proteasome to Facilitate Protein Accumulation in Chronic Neurological	150,000	69,750	219,750	275,000	127,875	402,875
Ye, Tong	PI	50%	R21 GN104683	NIH	09/01/12-08/31/14	Adaptive Wavefront Generation and Correction for Super High Resolution Microscopy	125,000	47,430	172,430	250,000	94,860	344,860
					Total Active Grants		6,182,873	2,377,881	8,152,240	25,236,674	10,748,485	36,555,157

INSPIRATION UNDERSTANDING SUCCESS INGENUITY INNOVATION

University Pooled Endowment Fund Investment Report

as of December 31, 2011

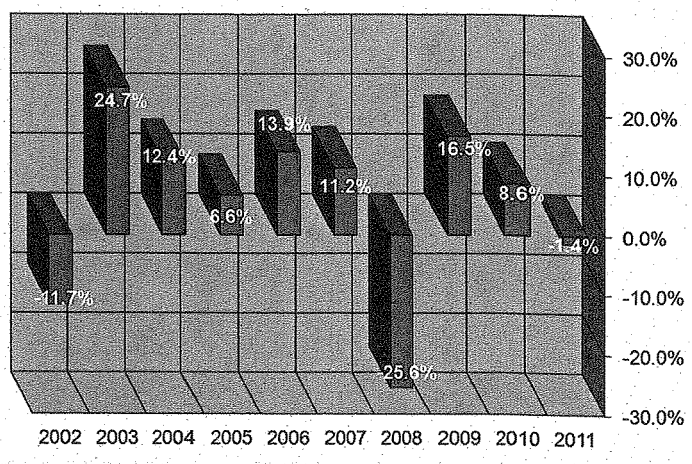
UAB UNIVERSITY DEVELOPMENT

Investment Report

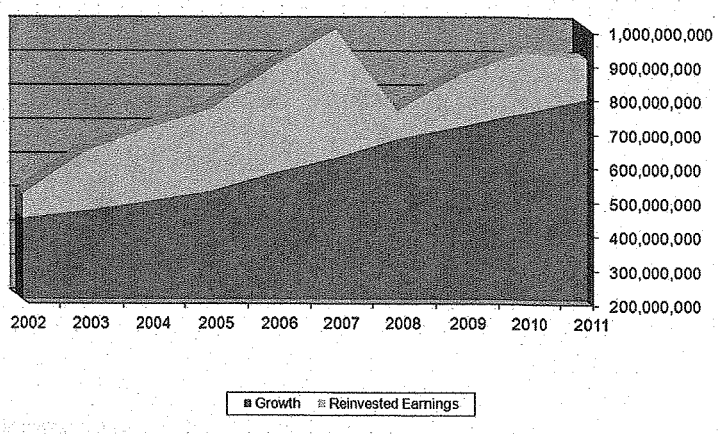
- Created in 1978, the University of Alabama Pooled Endowment Fund (UAPEF) is managed by the Chancellor's Office and is overseen by the Investment Committee of The Board of Trustees.
- As of December 31, 2011, the market value of the UAPEF was $912.4 million. Of this amount, 34.0%, or $310.2 million, is attributable to UAB and the Hospital.
- The UAPEF had a ten-year annualized investment return of 4.5% for the period ending December 31, 2011, compared to a return of 3.7% for the custom index.*
- The Investment Committee oversees investment activities, monitors performance of professional money managers, and ensures the prudent control of the investment of funds.
- Participants include all three campuses of the University of Alabama System along with related foundations.
- The Board seeks superior investment returns through professional money management. Assets of the UAPEF are managed by 38 professional investment firms.
- The UAPEF also utilizes an investment consultant, Cambridge Associates, with expertise in investment policy development, spending policy analysis, manager evaluation and selection, and performance evaluation.

*The custom index is a blend of indices that closely represents the actual UAPEF portfolio and is used as a benchmark for comparison, both in terms of return and risk.

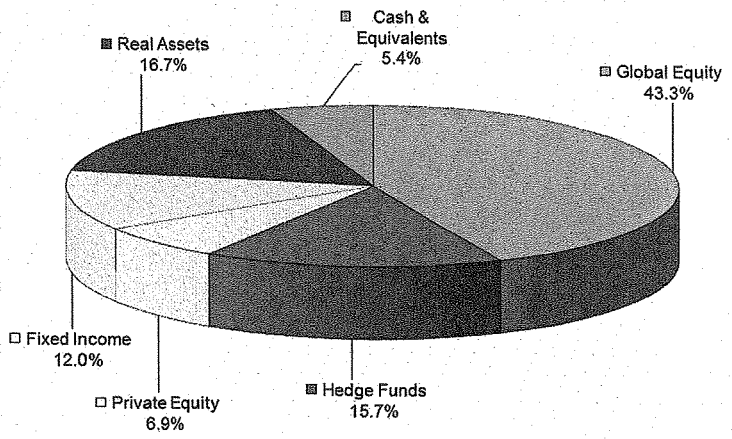
UAPEF Rates of Return
December 31, 2002 - December 31, 2011

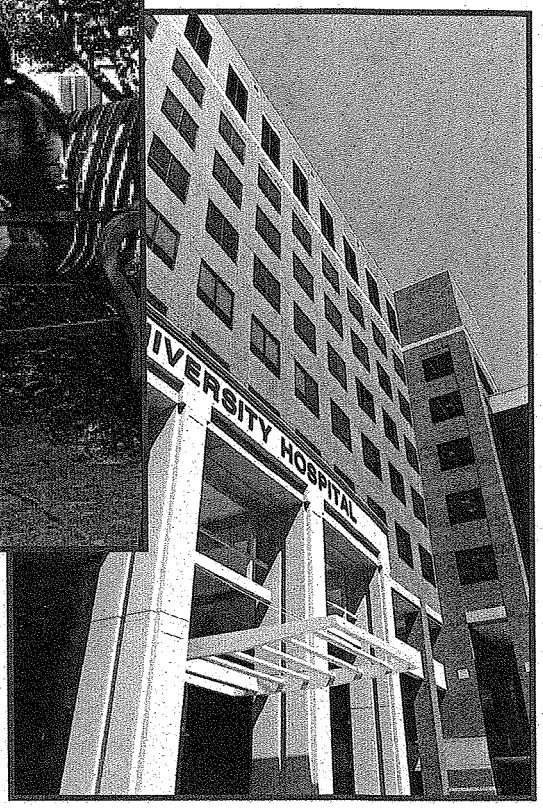


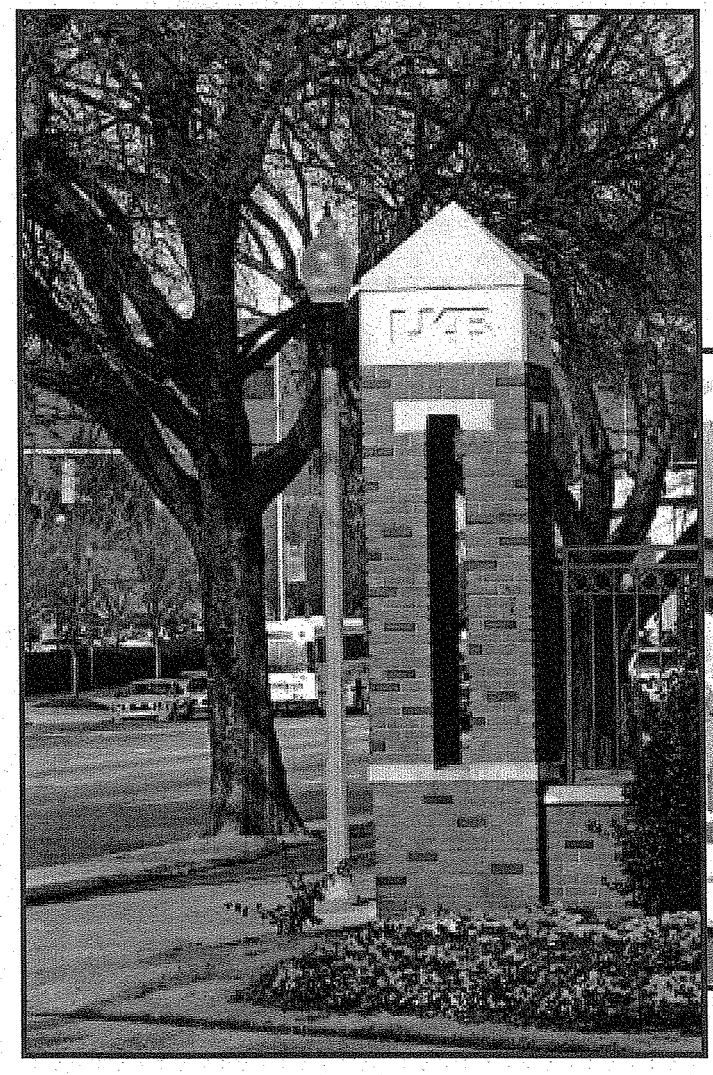
UAPEF Growth in Endowment Funds
December 31, 2002 - December 31, 2011

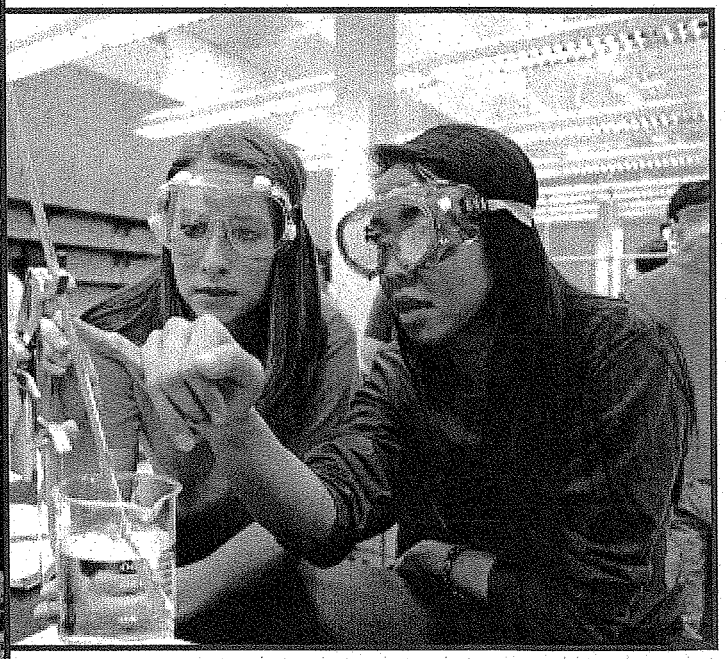


Asset Allocation
as of December 31, 2011

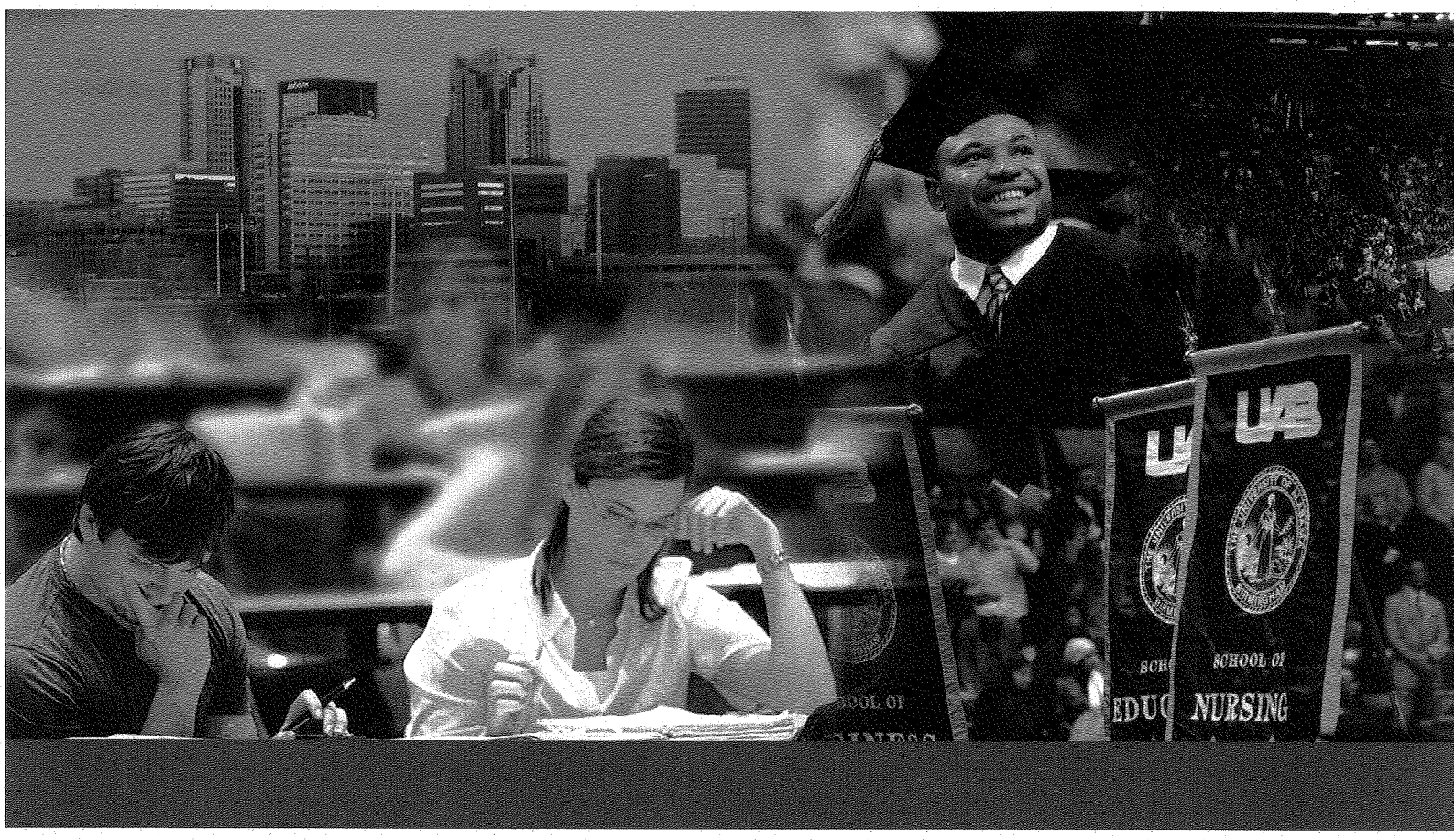



IVERSITY HOSPITAL


UAB



KNOWLEDGE SPIRIT ACHIEVEMENT DISCOVERY OPPORTUNITY VISION



UAB UNIVERSITY DEVELOPMENT

Daphne B. Powell
Director of Donor Stewardship
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In-house publication

LISTING OF INVESTIGATORS
AND
INDIVIDUAL FACULTY REPORTS

Investigators of the UAB McKnight Brain Institute:

Professors

J. David Sweatt, Ph.D.
Evelyn F. McKnight Chair, Department of Neurobiology
Director, UAB-MBI
Area of Interest: Signal transduction and transcriptional control in memory and aging

Karlene Ball, Ph.D.
Professor and Chair, Department of Psychology
Area of Interest: Aging-related cognitive function

James H. Meador-Woodruff, M.D.
Professor and Chair, Department of Psychiatry and Behavioral Neurobiology
Area of Interest: Cellular and subcellular alterations of neural circuitry and molecular expression in psychiatric illnesses

David Standaert, M.D., Ph.D.
Professor and Chair, Department of Neurology
Director, UAB Movement Disorders Center
Area of Interest: Striatal molecular and cellular biology, Parkinson's Disease

Michael Brenner, Ph.D.
Professor, Department of Neurobiology
Area of Interest: Glial cell biology, Alexander Disease

David Geldmacher, M.D. (Recruited to UAB from UVA, arrived March 2011)
Professor, Collat Scholar, Department of Neurology
Area of Interest: Aging-related memory disorders and visual cognition in AD.

John Hablitz, Ph.D.
Professor, Department of Neurobiology
Associate Director, UAB-MBRI
Area of Interest: Modulation of excitability in neocortial circuits

Robin Lester, Ph.D.
Professor, Department of Neurobiology
Area of Interest: Nicotinic receptors in CNS function

Lori McMahon, Ph.D.
Professor, Department of Physiology/Biophysics
Area of Interest: Hormonal control of synaptic plasticity in aging

Lucas Pozzo-Miller, Ph.D.
Professor, Department of Neurobiology
Area of Interest: Mechanisms controlling dendritic spine morphology

Harry Sontheimer, Ph.D.
Professor, Department of Neurobiology
Director, UAB Center for Glial Biology in Medicine
Area of Interest: Cell biology of glial function

Associate Professors

Lynn Dobrunz, Ph.D.
Associate Professor, Department of Neurobiology
Area of Interest: Regulation of short-term synaptic plasticity in the hippocampus

Alecia Gross, Ph.D.
Associate Professor, Department of Vision Sciences
Area of Interest: Signal transduction mechanisms in the CNS

Linda Overstreet-Wadiche, Ph.D.
Associate Professor, Department of Neurobiology
Area of Interest: Adult neurogenesis in the dentate gyrus

Vlad Parpura, M.D., Ph.D.
Associate Professor, Department of Neurobiology
Area of Interest: Imaging approaches to investigating synaptic and glial cell function

Erik Roberson, M.D., Ph.D.
Associate Professor, Department of Neurology
Area of Interest: Aging-related memory disorders

Anne Theibert, Ph.D.
Associate Professor, Department of Neurobiology
Area of Interest: PI-3-Kinase signal transduction in neuronal cell biology

Scott Wilson, Ph.D.
Associate Professor, Department of Neurobiology
Area of Interest: The ubiquitin/proteasome system in neuronal function

Assistant Professors

Tara DeSilva, Ph.D. (Recruited to UAB from Harvard in 2009)
Assistant Professor, PM&R
Area of Interest: Neural-glial signaling mechanisms in the CNS

Michelle Gray, Ph.D. (Recruited to UAB from UCLA in 2008, newly appointed Asst Prof)
Assistant Professor, Dixon Scholar, Department of Neurology
Area of Interest: Neurogenetics, glial function, and Huntington's Disease

Gwen King, Ph.D. (Recruited to UAB from Boston University, arrived March 2011)
Assistant Professor, Department of Neurobiology
Area of Interest: Memory and aging, Klotho proteins in aging and cognition

David Knight, Ph.D.
Assistant Professor, Department of Psychology
Area of Interest: Human imaging approached to investigating memory

Farah Lubin, Ph.D.
Assistant Professor, Department of Neurobiology
Area of Interest: Signal transduction mechanisms in memory and memory disorders

Michelle Olsen, Ph.D.
Assistant Professor, Department of Physiology and Biophysics
Area of Interest: Signal transduction mechanisms in the CNS, epigenetics

Scott Phillips, Ph.D.
Assistant Professor, Department of Neurobiology
Scientist, UAB IDDRC Recombinant Technologies Core
Area of Interest: Neurogenetics, neurobiochemistry

Kristina Visscher, Ph.D. (Recruited from Harvard)
Assistant Professor, Neurobiology
Area of Interest: Human imaging approaches to investigating memory

Jacques Wadiche, Ph.D.
Assistant Professor, Department of Neurobiology
Area of Interest: Synaptic plasticity and function in the cerebellum

Tong Ye, Ph.D.
Assistant Professor, Department of Neurobiology
Area of Interest: In vivo imaging, 2-photon imaging

Recent UAB McKnight Brain Institute New Faculty Recruits:

2006 Recruits:
Linda Overstreet Wadiche, Ph.D. (Recruited from the Vollum Institute)
Assistant Professor, Neurobiology
Area of Interest: Adult neurogenesis in the dentate gyrus.
Jacques Wadiche, Ph.D. (Recruited from the Vollum Institute)
Assistant Professor, Neurobiology
Area of Interest: Synaptic plasticity and function in the cerebellum

2007 Recruits:
David Knight, Ph.D. (Recruited from the NIH)
Assistant Professor, Psychology
Area of Interest: Human imaging approaches to investigating memory.
Vlad Parpura, M.D., Ph.D. (Recruited from the University of California, Riverside)
Associate Professor, Neurobiology

Area of Interest: Imaging approaches to investigating synaptic and glial cell function

Tong Ye, Ph.D. (Recruited from Duke University)
Assistant Professor, Neurobiology
Area of Interest: In vivo imaging, 2-photon imaging

David Standaert, M.D., Ph.D. (Recruited from Harvard in 2006)
Professor, Neurology
Director, UAB Movement Disorders Center
Area of Interest: Striatal molecular and cellular biology, Parkinson's Disease

2008 Recruits:

Kristina Visscher, Ph.D. (Recruited from Harvard)
Assistant Professor, Neurobiology
Area of Interest: Human imaging approaches to investigating memory

Erik Roberson, M.D., Ph.D. (Recruited from the University of California, San Francisco)
Assistant Professor, Neurology and Neurobiology
Area of Interest: Using genetically engineered mice to investigate aging-related memory dysfunction; Dr. Roberson also sees patients at the aging-related memory disorders clinic here at UAB

Farah Lubin, Ph.D. (Recruited from Baylor College of Medicine and UAB)
Assistant Professor, Neurobiology
Area of Interest: Epigenetic mechanisms in memory formation and memory dysfunction

2009 Recruits:

Alecia Gross, Ph.D. (Recruited from Baylor College of Medicine in 2006)
Assistant Professor, Vision Sciences
Area of Interest: Signal transduction mechanisms in the CNS

James H. Meador-Woodruff, M.D. (Recruited from Michigan in 2005)
Professor and Chair, Department of Psychiatry and Behavioral Neurobiology
Area of Interest: Cellular and subcellular alterations of neural circuitry and molecular expression in psychiatric illnesses

2010 Recruits:

Karlene Ball, Ph.D.
Professor and Chair, Department of Psychology
Area of Interest: Aging-related cognitive function

Tara DeSilva, Ph.D. (Recruited from Harvard in 2009)
Assistant Professor, PM&R
Area of Interest: Neural-glial signaling mechanisms in the CNS

Michelle Gray, Ph.D. (Recruited from UCLA in 2008, newly appointed Asst Prof)
Assistant Professor, Dixon Scholar, Dept of Neurology
Area of Interest: Neurogenetics, glial function, and Huntington's Disease

Michelle Olsen, Ph.D.
Assistant Professor, Physiology and Biophysics
Area of Interest: Signal transduction mechanisms in the CNS, epigenetics

2011 Recruits:

David Geldmacher, M.D. (Recruited from UVA, arriving March 2011)
Professor, Collat Scholar, Department of Neurology
Area of Interest: Aging-related memory disorders and visual cognition in AD

Gwen King, Ph.D. (Recruited from Boston University, arriving March 2011)
Assistant Professor, Neurobiology
Area of Interest: Memory and aging, Klotho proteins in aging and cognition
Scott Phillips, Ph.D. (Dr. Phillips was already a member of the UAB MBI in a Core Director capacity and was promoted to an Assistant Professor position in 2011.)
Assistant Professor, Neurobiology
Scientist, UAB IDDRC Recombinant Technologies Core
Area of Interest: Neurogenetics, neurobiochemistry

UAB McKnight Research Scientists:

Felecia Hester, B.S., MBA
Scientific Director, UAB McKnight Synaptic Plasticity Core
Area of Interest: Epigenetic control of neuronal biophysical properties
Jing Wang, Ph.D.
Scientist, UAB McKnight Synaptic Plasticity Core
Area of Interest: Place cells in the hippocampus

SWEATT INDIVIDUAL REPORT

McKnight Brain Research Foundation
Annual Report 2012
J. David Sweatt, Evelyn F. McKnight Chair
University of Alabama at Birmingham

This is an individual report for Dr. Sweatt as Evelyn F. McKnight Endowed Chair for Learning and Memory in Aging at UAB.

1. Summary of Scientific Achievements for 2012

Aging-related memory decline is manifest prominently in declarative/episodic memory and working memory, memory modalities anatomically based largely in the hippocampus and prefrontal cortex, respectively. The neurobiological underpinnings of age-related memory deficits include aberrant changes in gene transcription that ultimately affect the ability of the aged brain to be "plastic." This has led us to hypothesize that dysregulation of epigenetic control mechanisms and accumulation of aberrant epigenetic marks are a driver for aging-related cognitive dysfunction. Specifically, given that the transcription of key memory-promoting genes are known to decline during aging, we propose that these changes are regulated by aberrant epigenetic marks and control mechanisms within brain regions particularly vulnerable to the aging process (i.e. hippocampus and prefrontal cortex), which together result in age-related cognitive deficits. In studies over the last year we have made important discoveries concerning the role of epigenetic mechanisms in the hippocampus, which I will describe below.

Studies in the hippocampus: testing the hypothesis that DNA methylation controls hippocampal place field stability *in vivo*. Prior results have demonstrated that application of a variety of DNMT inhibitors, and conditional deletion of the DNMT 1 and 3A genes, leads to both deficits in hippocampal LTP and deficits in hippocampus-dependent long-term contextual learning. However, it is not known how the deficits in hippocampal plasticity lead to memory deficits in the behaving animal. In one series of recent experiments we focused on hippocampal function because it is an area of strength for the laboratory and because this brain region is known to be involved in long-term spatial memory. We investigated the role of DNA methylation at the cellular and systems level by investigating experience-driven long-term and short-term changes in *arc* gene DNA methylation in specific hippocampal neuronal subtypes using both immunohistochemistry and laser-capture dissection. We focused on *arc* because it is an immediate early gene widely validated as a molecular correlate of hippocampal place cell firing. In additional studies we investigated the capacity of DNA methylation to regulate hippocampal circuit function. Specifically, we undertook a systems neuroscience approach by investigating the capacity of DNA methylation to control hippocampal *arc* gene expression and by investigating the capacity of DNA methylation to control the formation and stabilization of *hippocampal place cell firing patterns*.

In executing these studies we used intracerebroventricular (ICV) infusions to pharmacologically manipulate hippocampal DNA methylation levels, and then applied in vivo single-unit neurophysiology techniques to record place cells in CA1 and CA3 as male rats explored a circular track in different environments. To assess the stability of place fields, we compared Pearson spatial correlation coefficients of place cell firing rate maps generated during sequential exposures to similar and dissimilar environments over a three-day period for each control and drug treatment condition.

Our results indicate that a DNA methyltransferase inhibitor (Zebularine) disrupts place field stability. These studies quantitated place field firing pattern correlations for single animals, assessing firing patterns when an animal was exposed to an environment (a circular maze) and then re-placed into the circular maze after a 10-minute time gap. Zebularine infusions led to significant decreases ($p<0.05$) in place cell firing pattern consistency between one maze exposure to the next. These results provide support for the hypothesis that DNA methylation is involved in maintaining temporal constancy in the output of hippocampal circuit function, specifically spatial representation as manifested in place field firing patterns.

Future studies will also focus on examining methylation effects over longer time scales and include additional analyses looking at influences on other place field properties such as spatial specificity, field size, infield firing rate, and center of mass shift. In a pilot study using similar protocols of sequential exposures or sessions in the same environment, with DNMTi treatment we continue to see significantly decreased correlation coefficients with both short inter-session intervals (15 min) and long inter-session intervals (240 min). We also see decreases in place field specificity (i.e. spatial information scores), and these differences are increased across sessions under long inter-session intervals.

We are currently writing up these studies and anticipate submitting them for publication in a few months.

Significance of these studies. Our investigation of epigenetic mechanisms as a target for learning-related changes in the adult CNS represents a major new direction for the memory field. Epigenetic mechanisms have received widespread attention for their roles in the regulation of cell division and differentiation. However, until lately the function of epigenetic mechanisms in terminally differentiated, post-mitotic cells has remained uninvestigated. Our findings demonstrate that epigenetic mechanisms play a role in synaptic plasticity and memory. As such, these findings greatly expand the known scope of the types of cellular mechanisms falling under the control of DNA methylation and histone modifications. Indeed, this new subdiscipline of neuroscience is now being referred to as *Behavioral Epigenetics*.

In terms of future studies, the project will continue to focus on the role of epigenetic mechanisms in hippocampus-dependent plasticity and memory and their role in memory storage in the cerebral cortex. I believe it is fair to say that over the last several years the laboratory has been one of the leading groups investigating the role of epigenetic molecular mechanisms in synaptic plasticity and memory. In addition, I believe that the novel targets of transcriptional regulation that we are proposing to investigate are the product of innovative thinking and that their pursuit will allow us to continue a leadership role in this area.

2. Publications in Peer Reviewed Journals

1. Protease-activated receptor-1 modulates hippocampal memory formation and synaptic plasticity. Almonte AG, Qadri LH, Sultan FA, Watson JA, Mount DJ, Rumbaugh G, Sweatt JD. J Neurochem. 2012 Oct 31.

2. Epigenetic Mechanisms in Learned Fear: Implications for PTSD. Zovkic IB, Sweatt JD. Neuropsychopharmacology. 2013 Jan;38(1):77-93. doi: 10.1038/npp.2012.79. Epub 2012 Jun 13.

3. Adult mice maintained on a high-fat diet exhibit object location memory deficits and reduced hippocampal SIRT1 gene expression. Heyward FD, Walton RG, Carle MS, Coleman MA, Garvey WT, Sweatt JD. Neurobiol Learn Mem. 2012 Jul;98(1):25-32.

4. Enhanced hippocampal long-term potentiation and fear memory in Btbd9 mutant mice. DeAndrade MP, Zhang L, Doroodchi A, Yokoi F, Cheetham CC, Chen HX, Roper SN, Sweatt JD, Li Y. PLoS One. 2012;7(4):e35518. Epub 2012 Apr 19.

5. Mechanisms of age-related cognitive change and targets for intervention: epigenetics. Kosik KS, Rapp PR, Raz N, Small SA, Sweatt JD, Tsai LH. J Gerontol A Biol Sci Med Sci. 2012 Jun;67(7):741-6.

6. Serine proteases, serine protease inhibitors, and protease-activated receptors: roles in synaptic function and behavior. Almonte AG, Sweatt JD. Brain Res. 2011 Aug 17;1407:107-22.

7. Epigenetic treatments for cognitive impairments. Day JJ, Sweatt JD. Neuropsychopharmacology. 2012 Jan;37(1):247-60.

8. Genetic Deletion of gadd45b, a Regulator of Active DNA Demethylation, Enhances Long-Term Memory and Synaptic Plasticity. Sultan FA, Wang J, Tront J, Liebermann DA, Sweatt JD. J Neurosci. 2012 Nov 28;32(48):17059-66.

3. Publications (other)

Books

Also for the last year, I was lead editor on a book that I feel will be foundational for the emerging field of behavioral epigenetics: *Epigenetic Regulation in the Nervous System; Basic Mechanisms and Clinical Impact*. The book is finished except for final page proofs, and the volume will be published by Elsevier in early 2013.

Book Chapters

NA

4. Recent Presentations at Scientific Meetings (also includes invited research seminars)

2011 (October – December):

New York Academy of Sciences, Epigenetics of AD symposium speaker
National Parkinson's Foundation Annual Meeting, plenary speaker

2012:

UT Southwestern, Department of Psychiatry
UCLA Center for Learning and Memory, invited symposium speaker
DARPA Workshop on Learning and Memory, invited speaker
UT Health Science Center San Antonio, Neuroscience seminar series
ACNP Annual Meeting, invited symposium speaker
Workshop Speaker, Neuroepigenetics Meeting, Baeza, Spain
Fondation IPSEN plenary lecture, FENS meeting, Barcelona, Spain
American College of Neuropsychopharmacology annual meeting, plenary speaker

2013:

UT Austin, Learning and Memory Biannual meeting, invited speaker
University of South Dakota, IdeaFest, keynote speaker
University of South Dakota School of Medicine UCSF, Gladstone Institute, Department of Neuroscience
Rosalind Franklin University, Department of Neuroscience, Chicago

University of British Columbia
Emory University, Neuroscience Graduate Program, invited speaker

5. Presentations at Public (non-scientific) Meetings or Events

Interviewed live on NPR *Science Friday* concerning epigenetic mechanisms in memory formation.

6. Awards and Honors

Neurobiology Foundation, Scientific Advisory Board, 2011 - present

National Advisory Mental Health Council (NIMH Council) 2012 - 2016

2012 Fondation IPSEN International Prize in Neural Plasticity (shared with Michael Meaney and Catherine Dulac)

Defense Advanced Research Projects Agency
Advanced Project: In Vivo Nanoplatforms for Epigenetic Enhancement of Memory
D. Sweatt PI
10/1/12 – 9/30/13 $325,000 total direct costs

Pitt-Hopkins Syndrome Foundation - Mouse Models for Pitt-Hopkins Syndrome
D. Sweatt PI
07/01/12 - 6/30/13 $160,000 total direct costs

Simons Foundation Autism Research Initiative - Explorer Award
Understanding the Basic Neurobiology of Pitt-Hopkins Disease
D. Sweatt PI
07/01/12 - 6/30/13 $54,000 total direct costs

Please note that Sections 7 through 9, and 11 through 16, are covered in the overall UAB MBI annual report, so I will not repeat them here.

Concerning Section 5b, trainee recruitment for my own laboratory – I recruited two new Post-doctoral Fellows to my laboratory this year, Andrew Kennedy and Dinesh Kumar. I also recruited one new MD/PhD student to the lab, David Figge.

I had a total of approximately 15 post-doc and grad student applications for my laboratory this year.

Andrew Kennedy joined the laboratory in September and was a PhD graduate student Chemistry at the University of Virginia. Andrew's project in the lab will be to investigate the role of the TCF4 transcription factor in controlling synaptic plasticity and memory formation.

Dinesh Kumar joined the laboratory in March 2012 after receiving his PhD at Umea University in Sweden. Dinesh is supported by a fellowship from the Swedish national science foundation. Dinesh is working on determining the biochemical mechanisms of active DNA demethylation in neurons.

David Figge is an outstanding MD/PhD student in the UAB Medical Scientist Training Program, working on control of amygdala DNA methylation and amygdala-dependent memory formation. David received his BS degree from Texas A&M.

10. External Collaborations

A. Collaborative Programs with other McKnight Institutes, Institutions and Research Programs

University of Arizona – We are continuing a very fruitful collaboration with Carol Barnes concerning the possible role of DNA methylation in controlling aging-related transcriptional alterations in the CNS.

UAB – We are collaborating with a number of McKnight investigators here at UAB, including Farah Lubin, David Standaert, Scott Wilson, Gwen King, and John Hablitz.

B. Collaborative Programs with non McKnight Institutes, Institutions and Research Programs

Temple University – We are collaborating with Dan Liebermann's laboratory to investigate the involvement of GADD45 in memory formation and LTP induction.

Johns Hopkins – We are collaborating with Honjun Song's laboratory to investigate the role of TET oxidases in active DNA demethylation in memory formation.

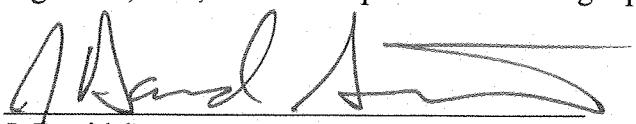
Baylor College of Medicine – We are collaborating with Jim Lupski on mouse models of Smith-Magennis Syndrome.

University of Maryland – We are collaborating with Susan Dorsey to investigate BDNF gene methylation in spinal cord plasticity.

University of Delaware – We are collaborating with Tania and Eric Roth to investigate the role of epigenetic mechanisms in stabilizing hippocampal place cell function.

Aurasense Pharmaceuticals/Northwestern University – This year we obtained funding for an innovative collaborative project developing nanotechnology-based next-generation histone de-acetylase inhibitors as memory-enhancing agents. This project is funded by DARPA.

Signature, date, and title of person submitting report



J. David Sweatt
Evelyn F. McKnight Endowed Chair
Director, Evelyn F. McKnight Brain Institute
Chairman, Department of Neurobiology
UAB School of Medicine

INDIVIDUAL INVESTIGATORS' SUMMARIES

1. Summary of Scientific Achievements for 2012

BRENNER

Using mice expressing a *lacZ* reporter gene under control of various mutated *GFAP* promoters, we have discovered that DNA binding sites for the transcription factors NF1 and NFκB are involved in limiting expression of the *GFAP* gene to astrocytes. Mutation of these sites leads to significant neuronal expression of the transgene in the hippocampus.

Using this same approach, we have discovered that a binding site for the transcription factor SP-1 is critical for *GFAP* expression. On the other hand, we have found that a site required for binding of AP-1 is not needed, in direct contradiction to several reports based on analyses performed using transfection of cultured cells.

The *GFAP* basal promoter contains a CATAAA "TATA" box sequence rather than the canonical TATAAA sequence. Using the transgenic approach described above, we have found that conversion of the *GFAP* CATAAA to TATAAA results in modestly elevated activity but largely abolishes the upregulation of the *GFAP* gene in response to injuries.

DOBRUNZ

My lab has investigated and discovered that transcriptional dysregulation in inhibitory interneurons, which models aspects brain changes that are seen schizophrenia, causes a dynamic imbalance between inhibitory and excitatory synaptic transmission in hippocampus. This reveals potential mechanisms underlying the cognitive dysfunction in schizophrenia; future work to find pharmacological ways to restore this balance could result in new treatments.

In collaboration with Scott Wilson, my lab has preliminary results suggesting that a component of the ubiquitin proteasome modulates hippocampal synaptic plasticity through ubiquitin signaling events, rather than through changes in protein turnover. This exciting result represents a novel mechanism for regulating presynaptic function and plasticity.

HABLITZ

Implemented an AAV-GFP methodology for in vivo labeling of aberrant pyramidal neurons in an animal model of cortical dysplasia.

Established a colony of transgenic rats expressing VGAT-YFP allowing recording from identified GABAergic interneurons.

KING

Klotho expression in brain: We developed an in situ hybridization probe to Klotho and mapped Klotho mRNA expression across the brain in the adult and across postnatal development. We find low-level, widespread expression across the brain in grey matter but not white matter.

Klotho function in retina: Using ERG we found a 60% deficit in photoreceptor function in animals missing Klotho. Follow-up studies are ongoing to (1) characterize the expression of Klotho in retina and (2) attempt and determine a mechanism to explain such a profound phenotype.

Klotho function in synaptic function: As part of our overall goal of assessing the role of Klotho in brain, we subjected brains of Klotho knockout and transgenic animals to electrophysiological assessment. We discovered that Klotho is important in paired-pulse facilitation and early LTP and are working to further characterize its role.

LESTER

Training of undergraduate students to perform surgical implants of osmotic minipumps for nicotine delivery and basic hippocampal electrophysiology.

Development of honors project for Mr. Nikhil Chatakondi.

Collaboration: Role of medial habenula α5 nAChRs in anti-reward during nicotine addiction; Dr. Paul Kenny, Scripps Institute. (Research proper to begin July 2012)

LUBIN

My research accomplishments as an assistant professor in the Department of Neurobiology include publishing manuscripts (13), book chapters (3), serving as ad-hoc reviewer for several peer-reviewed journals (16) and grant application agencies (6), and serving on a number of vitally important search committees (5).

In addition to the journal articles and awards listed below, 18 platform presentations and 14 poster presentations of my work were presented at universities throughout the U.S. or at national and international conferences over my time as a faculty member.

I have successfully obtained an independent investigator NIH R01 Award (A0 submission) and several foundation grants. My teaching contributions are numerous and are detailed in my attached curriculum vitae. As such, I continue to serve as an excellent role model for our undergraduate, graduate, post-doctoral trainees and young faculty members at UAB. I am making excellent progress towards tenure.

OVERSTREET-WADICHE

We identified the interneuron subtype that provides the initial synaptic input to adult generated granule cells and found that selective innervation of newborn cells by this interneuron subtype may mediate activity-dependent regulation of neurogenesis. This study was published in *Nature Neuroscience*. Supporting and extending this hypothesis, we have found that selective reduction of GABA release from this interneuron subtype is sufficient to disrupt adult neurogenesis.

We showed that GABA-mediated depolarization allows the activation of the first glutamate synapses on adult generated neurons, providing the first experimental evidence supporting a role for GABA in initial synapse unsilencing that was first proposed over 15 years ago. We have submitted a manuscript to a high-impact journal.

In our continuing collaboration with Candace Floyd, we found that a mild traumatic brain injury designed to mimic human head-impact mediated concussion results in a dramatic and persistent increase in adult neurogenesis and an increase in GABA release in the dentate gyrus. We are currently investigating the mechanisms and behavioral consequences of altered neurogenesis in this model of the most common brain injury.

PARPURA

Astrocytes release transmitters by vesicle fusion, in a manner similar to that of neuronal exocytosis. By examination of synaptobrevin 2 (Sb2) laden vesicles at single vesicle resolution, we provided detailed temporal characetirstics of this process in astrocytes (JA#75).

We described plasamlemmal Na^+/Ca^{2+} exchanger (NCX) operating in reverse mode as a major contributor to overall Ca^{2+} and Na^+ homeostasis in astrocytes both at rest and when these glial cells were mechanically stimulated. In addition, NCX facilitated mechanically induced Ca^{2+}-dependent exocytotic release of glutamate from astrocytes (JA#78).

Using single-molecule force spectroscopy, we studied interactions during the disassembly of the ternary SNARE complex pre-formed by binding Sb2 in parallel or anti-parallel orientations to the binary syntaxin 1A(Sx1A)-SNAP25B acceptor complex (JA#85); binary Sb2-Sx1A trans complexes were studied in both orientations as well (JA#76). We propose a model which considers the geometry for the vesicle approach to the plasma membrane with favorable energies and stability as the basis for preferential usage of the parallel ternary SNARE complex in exocytosis.

POZZO-MILLER

The first direct and physiological evidence of activity-dependent release of endogenous BDNF is impaired in slices from *Mecp2* mutant mice. Also, the first demonstration that TRPC3 and TRPC6 mRNA and protein levels are lower in *Mecp2* mutant hippocampus, and confirmation that BDNF mRNA and protein levels are also reduced occurred. Confirmation was achieved that MeCP2 is bound to the *Bdnf* promoter, as well as discovery that *Trpc3* is also a direct MeCP2 target, using ChIP. First revision resubmitted to *PNAS*.

The first description that hippocampal slices from *Mecp2* mutant mice are hyperexcitable due to an hyperactive CA3 region arising from an excitatory/inhibitory imbalance with reduced GABAergic inhibition and exacerbated glutamatergic excitation. In preparation.

The first demonstration that the TRPC6 channel activator hyperforin activates a postsynaptic current and Ca2+ elevations, as well as dendritic spine density in hippocampal CA1 pyramidal neurons. Published in Hippocampus.

SONTHEIMER

We had two scientific breakthroughs. We were finally able to demonstrate that patients with malignant brain tumors suffer seizures as a result of glutamate being released via the system Xc Glu transporter. This work was published in *Nature Medicine* (Buckingham et al., Sept. 2011) and laid the foundation for a phase I clinical trial at UAB that is reenrolling patients for treatment with the SXC inhibitor sulfasalazine. The data thus far looks spectacular, and we hope to submit a grant for the human study by October.

Second, using in vivo two photon imaging, we were able to show that invading gliomas utilize coordinated cell volume changes to propel their movement along blood vessels. We defined a hydrodynamic model for cell movement in the work published by Stacey Watkins in *J. Neuroscience* 2011 and *Trend in Neuroscience* 2012. This is somewhat of a game-changer as this ascribes a major role to dynamic cell volume changes as opposed to actin molecular motors to cell movement that likely applies to other brain cells as well.

THEIBERT

My laboratory has shown that both Arf6 and its GAP, ADAP1 are required for regulated secretory trafficking and dendritic differentiation in neurons, and we are investigating the mechanisms whereby Arf6 and ADAP1 control these activities. We have determined that BDNF traffics via the regulated secretory pathway in neuronal dendrites. We are using live imaging techniques to identify trafficking (Arfs and their GAPs) and cytoskeletal components that regulate trafficking of BDNF and are determining if dendritic BDNF trafficking is altered in a mouse model of the neurodevelopmental disorder, Rett syndrome.

VISSCHER

Older adults modulate alpha power less strongly than do younger adults. Our lab (see publication below) and others have previously shown that younger adults modulate alpha power (EEG activity measured over occipital and parietal scalp at about 8-14 Hz) dynamically depending on task demands. We show that older adults do not modulate alpha power to the same degree as young adults when ignoring irrelevant, potentially distracting information; this may underlie their general problems with attention and working memory (manuscript revised and resubmitted, *Neuroimage*).

We are measuring fMRI responses to visual stimuli in participants with macular degeneration. We have set up recruitment, training and testing pipeline incorporating the infrastructure of three labs and a clinic's infrastructure that allows us to measure neural activity in human low-vision participants in response to visual stimulation. Participants with macular degeneration may compensate for their lack of visual input by augmenting attention-related neural activity. We have observed stronger-than-control responses to attention cues.

In four retinotopically-mapped regions of visual cortex, we dissociated neural activity for processing stimuli, maintaining attentional task state and initiating a task state. This is important because activity associated with maintaining or initiating a task state is likely to influence stimulus processing. We can now compare such activity directly in different sensory cortex regions.

WADICHE

We demonstrated that physiological regulation of neuronal glutamate transporters is sufficient to alter signaling to neighbor glial cells. This work was published in the *Journal of Neuroscience* and is the major portion of my second graduate student, Ming-Chi Tsai, who earned his Ph.D. in April 2012.

We uncovered how neurotransmitter spills out to excite and inhibit interneurons not connected by canonical synapses. This form of neural communication likely expands the computational range of interneuronal networks. This work is included in a manuscript that is in preparation.

Following our recent publication (Rudolph et al., 2011 Neuron 70:991-1004), we found that the identity of presynaptic calcium channel subtype underlies the mode of vesicle fusion. Additionally, we discovered that presynaptic protein kinase C regulation is masked by postsynaptic receptor occupancy, thus revealing additional targets for regulation of neurotransmitter release. These works will be part of two separate manuscripts.

WILSON

We have utilized a small molecule inhibitor to demonstrate that acute inhibition of Usp14 can reproduce the hippocampal and NMJ deficits observed in Usp14 deficient mice. This observation suggests that deubiquitinating activity of Usp14 is required for presynaptic function.

We have determined that Usp14 can control the turnover of unstable proteins in neurons. This observation indicates that Usp14 acts on specific substrates on the proteasome to control their abundance.

2. Publications in Peer Reviewed Journals

BRENNER

Flint, D., Li, R., Webster, L.S., Naidu, S., Kolodny, E., Percy, A., van der Knaap, M., Powers, J.M., Mantovani, J.F., Ekstein, J., Goldman, J., Messing, A. and Brenner, M. (2012). Splice Site, Frameshift and Chimeric GFAP Mutations in Alexander Disease. Hum Mutat 33 1141-1148.

Messing, A., Brenner, M., Feany, M.B., Nedergaard, M., and Goldman, J.E. (2012). Alexander Disease. J. Neurosci. 32, 5017-5023.

Updates (publication dates) for previous "in press" listings:

Messing, A., Li, R., Naidu, S., Taylor, P., Silverman, L., Flint, D., van der Knaap, M., and Brenner, M. (2012). Archetypal and new families with Alexander disease and novel mutations in *GFAP*. Arch. Neurol. 69:208-214.

Prust, M.J., Wang, J., Morizono, H., Messing, A., Brenner, M., Gordon, E.S., Hartka, T., Sokohl, A., Schiffmann, R., Gordish-Dressman, H., Albin, R., Amartino, H., Brockman, K., Dinopoulos, A., Dotti, M.T., Fain, D., Fernandez, R., Ferreira, J., Fleming, J., Gill, D., Griebel, M., Heilstedt, H., Kaplan, P., Lewis, D., Nakagawa, M., Pederson, R., Reddy, A., Sawaishi, Y., Schneider, M., Sherr, E., Takiyama, Y., Wakabayashi, K., Gorospe, R. and Vanderver, A. (2011). GFAP mutations, age of onset and clinical subtypes in Alexander disease, Neurology 77:1287-1294.

HABLITZ

Albertson, A., Yang, J. and Hablitz, J.J. Decreased hyperpolarization-activated current (Ih) in layer 5 pyramidal neurons enhances excitability in focal cortical dysplasia. J Neurophysiol. 2011, 106-2189. PMID: 21795624.

KING

So P, Zeldich E, Seyb KI, Huang MM, Concannon JB, King GD, Chen C, Cuny GD, Glicksman MA, Abraham CR. Lowering of amyloid beta peptide production with a small molecule inhibitor of amyloid beta precursor protein dimerization. Am J Neurodegener Dis. (2012) 1(1):75-87. [PMC Journal – In Process].

King GD, Rosene D, Abraham CR. Promoter methylation and age-related downregulation of klotho in rhesus monkey. Age (Dordr). (2011) Sep 16. [Epub ahead of print], PMID:21922250 [PMC Journal – In Process].

King GD, Huang M, Schuman E, Chen CD, Cuny G, Glicksman M, Abraham CR. Identification of novel small molecules to modulate transcription of Klotho. Biochem J. (2012) Jan 1;441(1):453-61. PMID:21939436. [PMC Journal – In Process].

King GD, Muhammad AK, Larocque D, Kelson KR, Xiong W, Liu C, Sanderson NS, Kroeger KM, Castro MG, Lowenstein PR. Combined Flt3L/TK gene therapy induces immunological surveillance which mediates and immune response against a surrogate brain tumor neoantigen. Molecular Therapy (2011) 19(10): 1793-801. PMID: 21505426 PMCID PMC3188756.

Mineharu Y, King GD, Muhammad AK, Bannykh S, Kroeger KM, Liu C, Lowenstein PR, Castro MG. Engineering the brain tumor microenvironment enhances the efficacy of dendritic cell vaccination: implications for clinical trial design. Clinical Cancer Research (2011) 17 (14):4705-18. PMID: 21632862 PMCID PMC3208508.

LUBIN

R.R. Parrish and F.D. Lubin. Direct bisulfite sequencing for examination of DNA methylation with gene and nucleotide resolution from brain tissues. 2012. *Current Protocols in Neurosci.* In press.

F.D. Lubin. Epileptogenesis: Can the Science of Epigenetics Give Us Answers? 2012, *Epilepsy Currents* In Press.

S. Gupta-Agarwal, A. Franklin, T. Deramus, R.L.Davis, L.L. McMahon, and F.D. Lubin. G9a/GLP epigenetic suppressor complex activity in the entorhinal cortex and hippocampus is required for activation and repression of gene transcription during memory formation. 2012, *J. Neurosci.* 8 April 2012, 32(16): 5440-5453. Selected by Faculty of 1000 (F1000).

R.E. Puckett and F.D. Lubin. Epigenetic mechanisms in experience-driven memory formation and behavior. *Epigenomics*, October 2011, 3 (5):649-664.

G. Calfa, C. Chapleau, S. Campbell, T. Inoue S. Morse, F. D. Lubin, and L. Pozzo-Miller. HDAC Activity is Required for BDNF to Increase Quantal Neurotransmitter Release and Dendritic Spine Density in CA1 Pyramidal Neurons. 2012, *Hippocampus* In Press.

OVERSTREET-WADICHE

Markwardt SJ, Dieni C, Wadiche JI, Overstreet-Wadiche L (2011) Ivy/Neurogliaform interneurons coordinate activity in the neurogenic niche. *Nature Neuroscience,* 14:1407-09.

Römer B, Krebs J, Overall RW, Fabel K, Babu H, Overstreet-Wadiche L, Brandt M, Williams RW, Jessberger S, Kempermann G (2011) Adult hippocampal neurogenesis and plasticity in the infrapyramidal bundle of the mossy fiber projection: I. Co-regulation by activity. *Frontiers in Neurogenesis,* 5:107.

Tsai MC, Tanaka K, Overstreet-Wadiche L, Wadiche JI (2012) Neuronal glutamate transporters regulate glial excitatory transmission. *Journal of Neuroscience* 32:1528-35.

PARPURA

Reyes, R.C., Verkhratsky, A., Parpura, V. (2012) Plasmalemmal Na^+/ Ca^{2+} exchanger modulates Ca^{2+}-dependent exocytotic release of glutamate from rat cortical astrocytes. *ASN Neuro* 4(1): pii: e00075. doi: 10.1042/AN20110059. (13 pp).

Verkhratsky A., Rodríguez, J.J., Parpura, V. (2012) Calcium signalling in astroglia. *Mol Cell Endocrinol*, 353(1-2):45-56.

Parpura, V., Heneka, M.T., Montana, V., Oliet, S.H.R., Schousboe, A., Haydon, P.G., Stout, R.F. Jr., Spray, D.C., Reichenbach, A., Pannicke, T., Pekny, M., Pekna, M., Zorec, R., Verkhratsky A. (2012). Glial cells in (patho)physiology. *J Neurochem.* 121: 4-27.

Zorec, R., Araque, A., Carmignoto, G., Haydon, P.G., Verkhratsky, A., Parpura, V. (2011) Astroglial excitability and gliotransmission: An appraisal of Ca^{2+} as a signalling route. *ASN Neuro,* 4(2):art:e00080.doi:10.1042/AN20110061 (17 pp).

Qadri, Y.I., Cormet-Boyaka, E., Rooj, A.K., Lee, V., Parpura, V., Fuller, C.M., Berdiev, B.K. (2012) Low Temperature and Chemical Rescue Affect Molecular Proximity of ΔF508-Cystic Fibrosis Transmembrane Conductance Regulator (CFTR) and Epithelial Sodium Channel (ENaC). J Biol Chem. 287: 16781-16790.

Parpura, V., Verkhratsky, A. (2012) The astrocyte excitability brief: From receptors to gliotransmission. *Neurochem Int,* 2012 Jan 17. [Epub ahead of print] doi: 10.1111/j.1471-4159.2012.07664.x.

Verkhratsky A., Rodríguez, J.J., Parpura, V. (2012) Neurotransmitters and integration in neuronal-astroglial networks. Neurochem Res. 2012 Apr 3. [Epub ahead of print].

Liu, W., Stout, R.F.Jr, Parpura, V. (2012) Ternary SNARE complexes in parallel *versus* anti-parallel orientation: examination of their disassembly using single-molecule force spectroscopy. *Cell Calcium* 2012 Apr 21. [Epub ahead of print].

Kirischuk, S., Parpura, V., Verkhratsky, A. (2012) Sodium dynamics: another key to astroglial excitability? TINS. 2012 May 25. [Epub ahead of print].

Trkov,S., Stenovec, M., Kreft ,M., Potokar, M., Parpura, V., Davletov, B., Zorec, R. (2012) Fingolimod-A sphingosine-like molecule inhibits vesicle mobility and secretion in astrocytes. *Glia* 2012 May 25. [Epub ahead of print] doi: 10.1002/glia.22361.

POZZO-MILLER

1. Leuner K, W Li, MD Amaral, S Rudolph, G Calfa, AM Schuwald, C Harteneck, T Inoue & L Pozzo-Miller (2012). Hyperforin modulates dendritic spine morphology in hippocampal pyramidal neurons by activating Ca^{2+}-permeable TRPC6 channels. *Hippocampus* In Press (published online; doi: 10.1002/hipo.22052).
2. Chapleau CA, J Lane, L Pozzo-Miller & AK Percy (2012). *Defining and Diagnosing Rett Syndrome: Correlating Symptoms and Pathogenesis with Autism.* In: "The Comprehensive Guide to Autism", V Patel, V Preedy, C Martin (Eds.). Berlin: Springer Reference, Springer-Verlag.
3. Chapleau CA, J Lane, L Pozzo-Miller & AK Percy (2012). Evaluation of current pharmacological options in the management of Rett syndrome: from the present to future therapeutic alternatives. *Current Clinical Pharmacology* In press.
4. Amaral MD & L Pozzo-Miller (2012). Intracellular Ca^{2+} stores and Ca^{2+} influx are both required for BDNF to rapidly increase quantal vesicular transmitter release. *Neural Plasticity* vol. 2012, Article ID 203536, 10 pages (doi:10.1155/2012/203536).

5. Chapleau CA, EM Boggio, G Calfa, AK Percy, M Giustetto & L Pozzo-Miller (2012). Hippocampal CA1 pyramidal neurons of *Mecp2* mutant mice show a dendritic spine phenotype only in the presymptomatic stage. *Neural Plasticity* vol. 2012, Article ID 976164, 9 pages (doi:10.1155/2012/976164).
6. Hartmann D, J Drummond, E Handberg, S Ewell & L Pozzo-Miller (2012). Multiple approaches to investigate the transport and activity-dependent release of BDNF and their application in neurogenetic disorders. *Neural Plasticity* vol. 2012, Article ID 203734, 10 pages (doi:10.1155/2012/203734).
7. Chapleau CA & L Pozzo-Miller (2012). Divergent roles of $p75^{NTR}$ and Trk receptors in BDNF's effects on dendritic spine density and morphology. *Neural Plasticity* vol. 2012, Article ID 578057, 9 pages (doi:10.1155/2012/578057).
8. Calfa G, AK Percy & L Pozzo-Miller (2012). *Rett Syndrome: On Clinical and Genetic Features of Rett Syndrome and Experimental Models based on Mecp2 Dysfunction.* In: "The Autisms: Molecules to Model Systems", L Monteggia and C Powell (Eds.). New York: Oxford University Press.
9. Calfa G, AK Percy & L Pozzo-Miller (2012). *Dysfunction of the methyl-CpG binding protein MeCP2 in Rett syndrome.* In: "Patho-Epigenetics of Disease", J Minarovits and HH Niller (Eds.) New York: Springer Science and Business Media.
10. Calfa G, CA Chapleau, S Campbell, T Inoue, SJ Morse, FD Lubin & L Pozzo-Miller (2012). HDAC activity is required for BDNF to increase quantal neurotransmitter release and dendritic spine density in CA1 pyramidal neurons. *Hippocampus* 22: 1493-1500.

b) Submitted

1. Li W, G Calfa & L Pozzo-Miller. Activity-dependent BDNF release and TRPC signaling is impaired in hippocampal neurons of *Mecp2* mutant mice. To *PNAS* (First resubmission under review).
2. Larimore J, CA Chapleau, CD Moore, S Worth, I Rolle, Z Nie, L Pozzo-Miller & A Theibert. The Arf1 GAP AGAP1/Centg2 regulates neuronal differentiation. To *Journal of Neurochemistry.*

c) Published Abstracts

1. Pozzo-Miller L, W Li, JM Rutherford & G Calfa (2012). Excitation/Inhibition imbalance in area CA3 of symptomatic *Mecp2* mutant mice leading to hippocampal network hyperexcitability. *FENS Forum Abstract* 2012, 58.07.

SONTHEIMER

Sims B, Clarke M, Francillion L, Kindred E, Hopkins ES, Sontheimer H. Hypoxic preconditioning involves system Xc(-) regulation in mouse neural stem cells. Stem Cell Res. (2012) Mar;8(2):285-91. PMID:22056639.

Vishnu Cuddapah, Christa Habela, Stacey Watkins, Lindsay Moore, Tia-Tabitha Barclay, and Harald Sontheimer. Kinase activation of ClC-3 accelerates cytoplasmic condensation during mitotic cell rounding. Am J Physiol Cell Physiol. (2012) Feb;302(3):C527-38. PMID: 22049206.

Sontheimer, H. and Bridges, R.J. Sulfasalazine for brain cancer fits. Expert Opinion on Investigational Drugs. (2012). 21(5):575-8. PMID: 22404218.

VISSCHER

Nenert, R., Viswanathan, S., Dubuc, D.M., Visscher, K.M. (2012) Modulations of ongoing alpha oscillations predict successful short-term visual memory encoding. Frontiers in Human Neuroscience. 6:127 PMID: *22586390.*

WADICHE

Markwardt SJ, Dieni C, Wadiche JI, Overstreet-Wadiche L (2011) Ivy/Neurogliaform interneurons coordinate activity in the neurogenic niche. *Nature Neuroscience,* 14:1407-09.

Tsai MC, Tanaka K, Overstreet-Wadiche L, Wadiche JI (2012) Neuronal glutamate transporters regulate glial excitatory transmission. *Journal of Neuroscience* 32:1528-35.

WILSON

Bhattacharyya BJ, Wilson SM, Jung H, Miller RJ. 2012. Altered neurotransmitter release machinery in mice deficient for the de-ubiquitinating enzyme, Usp14. Am J Physiol Cell Physiol. 302(4):C698-708.

3. Publications – Other

BRENNER

Brenner, M. Alexander's Disease, Encyclopedia of the Neurological Sciences 2nd Edition (in press).

LESTER

Lester, R.A.J. Defining the Role of the Hippocampus in Nicotine Addiction, In Nicotine Addiction: Prevention, Health Effects and Treatment Option (ed. G. Di Giovanni) Nova Publisher, New York, 2012 (In Press) (Invited Review ~ not peer reviewed).

LUBIN

Book Chapters

DNA-methylation and memory formation. Role of DNA-Demethylation in Cancer and Development; Samir K Patra (Editor), Moshe Szyf (Co-editor), and Cristina Alves dos Santos (Publishing editor, Springer). Invited review in *Press.*

PARPURA

Books (1)

Silva, G.A., Parpura, V. (Eds.) Nanotechnology for biology and medicine: At the building block level. Springer, New York, NY (2012) (Nov 2, 2011; 234 pp).

Edited volume/series (2)

Verkhratsky, A., Parpura, V. (Eds.) Physiology and Pathophysiology of Neuroglia. The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London (online at http://hstalks.com/main/browse_talks.php?father_id=584&c=252) (2011).

Parpura, V., Verkhratsky, A. (Guest Eds.) Online collection: Neuroglia - more than a nervenkitt. ASN Neuro(online at http://www.asnneuro.org/an/online_collection.htm) (2012).

Book Chapters (4)

Verkhratsky, A., Parpura V., Kettenmann, H. (2012) Astrocytes. In: Aminoff, M.J., Daroff, R.B. (Eds.) Encyclopedia of Neurological Sciences, 2nd edition, Elsevier, In Press.

Verkhratsky, A., Parpura V. (2012) Calcium signalling in neuroglia. In: Kettenmann, H, Ransom, B.R. (Eds). Neuorglia, 3rd edition, Oxford University Press, New York, In Press.

Verkhratsky, A., Parpura V. (2012) Astroglial calcium signalling and calcium waves. In: Dere, E. (Ed) Gap Junctions in the Nervous System: Physiological and Pathological Roles. Elsevier, In Press.

Verkhratsky, A., Noda, M., Parpura, V., Kirischuk, S. (2012) Sodium fluxes and astroglial function *Adv Exp Med Biol*, In Press.

Commentaries (3)
Parpura, V. (2012) Bionanoelectronics: Getting close to the action. Nat. Nanotechnol. 7:143-145. [news&views].

Parpura V., Verkhratsky, A. (2012) Neuroglia at the crossroads of homeostasis, metabolism and signaling: Evolution of the concept. ASN Neuro 4(4):art:e00087.doi:10.1042/AN20120019. [overview]-peer reviewed (5 pp).

VISSCHER
Elkhetali, A.S., Vaden, R.J., Pool, S.M., Visscher, K.M. (2012). Three measures of ongoing neural activity examined in retinotopically mapped visual cortex. Vision Sciences Society Meeting Abstracts.

Nenert, R., Dubuc, D.C., Viswanathan, S., Visscher, K.M. (2011). Prestimulus synchronization and poststimulus desynchronisation of alpha oscillations predict successful short-term visual memory encoding. Society for Neuroscience Abstracts.

Burge, W., Amthor, F., Nenert R., Zotov, A., Visscher, K.M. (2011). The effect of speed of processing training on eye movements. Society for Neuroscience Abstracts.

4. Presentations at Scientific Meetings

HABLITZ
"HCN Channels Constrain Epileptiform Network Activity." A.J. Albertson, S.B. Williams, J.J. Hablitz. Society for Neuroscience Meeting, Washington DC, 2011.

Invited Speaker and Organizer, Investigator's Workshop, American Epilepsy Society Annual meeting, "HCN channels in epilepsy."

Invited Speaker, WONOEP, Grottaferrata,Italy August 23-26, "HCN Channels Modulate Excitatory Activity onto Cortical Interneurons."

LESTER
Society for Research on Nicotine and Tobacco, Houston, TX, Mar 13, 2012 (Pre-Conference Workshop "Cholinergic Regulation of Addiction and Disease: Understanding Mechanisms and Identifying Novel Therapeutic Targets") (workshop).

Neuroscience, Physiology & Pharmacology, University College London, UK Mar 22, 2012 (seminar)

School of Biomolecular &Biomedical Science Conway Institute, University College Dublin, Ireland, Mar 28, 2012 (seminar).

Neuroscience Society (Students): Trinity College Dublin, Ireland, Mar 29, 2012 (seminar).

LUBIN

The Role of Epigenetic Mechanisms in the Development and Maintenance of Human Cognition. Invited by Drs. Suzana Petanceska and Paul Coleman, Minisymposium. The Society for Neuroscience Annual Meeting, New Orleans, LA.

Histone methylation mechanisms in cognitive aging. Invited by Dr. Michele K. Evans, Deputy Scientific Director of the National Institute on Aging Intramural Research Program.

Chromatin remodeling mechanisms in memory. Seminar series at The Nestle Institute of Health Sciences. Lausanne, Switzerland. Invited by Dr. Martin Kussmann.

Epigenetic histone methylation in memory. Neuroscience seminar series at Meharry Medical College/Vanderbilt University. Invited by Dr. Darryl Hood.

Epigenetic mechanisms in epileptogenesis and memory. Gordon Research Conference "Mechanisms of Epilepsy and Neuronal Synchronization." Invited by Drs. Amy Brooks-Kayal and Carolyn Houser.

OVERSTREET-WADICHE

Invited speaker at the Gordon Research Conference on Inhibition in the CNS. July 2011 Best poster award (graduate student Jessica Chancey, First Author) at the meeting. Noted on last year's review.

Invited speaker at International Neuroscience Meeting March 1-3 entitled Symposium on Neuronal and Glial signaling in Bonn, Germany.

Departmental seminar speaker:
Jan 2012 Dept. Physiology and Neurobiology, Dartmouth Medical School
May 2012 Dept of Neuroscience, Albert Einstein College of Medicine
May 2012 NIH Synaptic Integration Seminar Series

PARPURA

1/20/12 "Astrocyte biology: Bidirectional signaling between astrocytes and neurons", Glial Biology/Neuroimmunology/Neurooncology Retreat, Comprehensive Neuroscience Center, UAB.

2/2/12 Exocytosis in astrocytes: Emphasis on single vesicle/molecule measurements, Department of Physiology, Otago School of Medical Sciences, University of Otago, Dunedin, New Zealand.

2/21/12 "Exocytotic release of glutamate from astrocytes", Department of Pharmacology, School of Medicine, Vanderbilt University, Nashville, TN.

3/24/12 "Carbon nanotubes at the interface of neurobiology: morphological-functional changes of neurons and astrocytes", Neuromodulation Brainstorming Retreat, Carmel, CA.

4/30/12 "Exocytosis in astrocytes: Emphasis on single vesicle/molecule measurement", Department of Biomedical Sciences, Iowa State University, Ames, IA.

POZZO-MILLER
Department of Cell Biology & Physiology, Washington University, St. Louis MO (May 2012).

Department of Neuroscience and Experimental Therapeutics, Texas A&M University Health Science Center, Bryan TX (March 2012).

SONTHEIMER
Keynote speaker, Stony Brook Cancer Center, Targeted Therapies in Cancer (4/24/2012).

THEIBERT
January 20, 2012, Undergraduate Neuroscience Colloquium-seminar.

VISSCHER
Bevill Neuroscence Symposium, UAB, October 4, 2011, Conference on Cognition and Cognitive Disorders.

WADICHE
May 2012, Dept of Neuroscience, Albert Einstein College of Medicine.

5. Presentations at public (non-scientific) meetings or events

LESTER
Southeastern Medical Scientist Symposium (Breakout Session "Grant Writing Success for the Physician-Scientist in Training"), Atlanta, GA, Sep 17, 2011.

Lecture on Nicotine and Addiction to the Retired Businessmen's Association of Birmingham, "Men's Morning Coffee", Mar 5, 2012.

LUBIN
CHDI Foundation workshop on HDAC4 and Huntington's Disease (HD). Los Angeles, California.

The research being conducted at the Civitan International Research Center. University of Alabama at Birmingham, Birmingham, Alabama. Invited by CIRC to talk to guests at the annual Paisley's Bicycle Relay Across America event.

Career options in research. University of Alabama at Birmingham, Birmingham, Alabama. Spoke to students in SPIN (Summer Program in Neuroscience).

Grant writing workshop sponsored by the Postdoctoral Association. University of Alabama at Birmingham, Birmingham, Alabama. Spoke to postdocs and faculty about the NIH-K99 funding mechanism.

VISSCHER
Brain Awareness Week (March 2012), McWane Center.

6. Awards

BRENNER
Graduate Dean's Award for Excellence in Mentorship

LUBIN
2010-Present- AES Official Fellows Host
I have been appointed the official host for The American Epilepsy Society (AES) Fellows Program. AES is one of the oldest neurological professional organizations in this country. Through several sponsors AES awards grants and fellowships for cutting edge research into the causes of epilepsy. The AES Fellows host ensures that the fellowship program continues to recognize outstanding recipients to make it a success. As a past recipient of an AES fellowship award, it is an honor to serve.

OVERSTREET-WADICHE
2012-2014 NIH F31 NS078887
NRSA fellowship supporting Jessica Chancey, graduate student in the lab
Role, mentor.

2012-2017 NIH 1R01NS075162-01
Role of dentate gyrus gating and neurogenesis in the pathophysiology of mild TBI
Role, Collaborator (PI: Candace Floyd).

PARPURA
2012-15 Mentor, The Beckman Scholars Program at University of Alabama at Birmingham.

POZZO-MILLER
Chair Nanosymposium at the Society for Neuroscience Annual Meeting, Washington, DC.

Chair Working Group, NIH Workshop on "*Setting Priorities for Therapy Development in Rett Syndrome*", Bethesda, MD.

Invited Speaker, "*Synaptic Dysfunction in Autism Spectrum Disorders*" Symposium, Center for Translational Social Neuroscience, Emory University, Atlanta GA.

7. External collaborations with other McKnight Institutes, institutions and research programs

LESTER
Within the UAB System
Scott Wilson: Preparation of electrophysiological rig for neuromuscular junction recording
Farah Lubin: Physiological outcomes of epigenetic regulation after nicotine exposure
Edgar Jaimes: Tobacco and Renal Disease: Role of Nicotine Receptor Activation

LUBIN
Outside the UAB System
Carol Barnes-University of Arizona
Hendrik Luesch-University of Florida

OVERSTREET-WADICHE
Within the UAB System
Jacques Wadiche
Gwen King
Erik Roberson

VISSCHER
Member of the McKnight MRI Standardization Workgroup.

WADICHE
Within the UAB System
Linda Overstreet Wadiche

8. Collaborative programs with non-McKnight institutes, institutions and research programs

BRENNER
Inside the UAB System
Dr. Anthony Nicholas, Associate Professor of Neurology: the role of GFAP deimidation in Alexander disease

Dr. Rong Li, Resident and Research Associate in Neuropathology: investigation of monoallelic expression of GFAP in mice and man

Dr. Stephen Barnes, Professor of Pharmacology: proteomic analysis of Rosenthal fibers in Alexander disease

Outside the UAB System
Albee Messing, University of Wisconsin, Madison: Studies of GFAP transcription; analyses of Alexander disease cases

Sakkubai Naidu, Johns Hopkins University School of Medicine, Baltimore, MD; Edwin Kolodny, New York University School of Medicine, New York, NY; Marjo van der Knaap, VU University Medical Center, Amsterdam, The Netherlands; James M. Powers, University of Rochester/Strong Memorial Hospital, Rochester, NY: Case studies of Alexander disease patients

Jim Goldman, Columbia Medical School, NY, NY; Mel Feany, Harvard Medical School, Boston, MA; Maiken Nedergaard, Rochester Medical School, Rochester, NY; Roy Quinlan, The University, Durham, England: Studies of mechanisms by which GFAP mutations cause Alexander disease

DOBRUNZ
Within the UAB System
Scott Wilson
Rita Cowell
Tim Gawne

KING
Within the UAB System

Sarah Clinton – In situ hybridization mapping of Klotho expression in adult and postnatal development

LESTER
Outside the UAB System
Paul Kenny, Scripps Institute

LUBIN
Within the UAB System
Mike Brenner Lab
Locus Pozzo-Miller Lab
Sue Spiller
Standaert Lab
Olsen Lab
Lester Lab

OVERSTREET-WADICHE
Within the UAB System
Candace Floyd, UAB

Outside the UAB System
Amelia Eisch, UTSW
Dave Poulson, University of Montana Missoula
Karoly Mirnics, Vanderbilt

PARPURA
Within the UAB System
B. Berdiev and C. Fuller - CFTR/ENaC plasma membrane interactions
M. Gray - The role of astrocytes in Huntington's disease
J. Kim - EGCG effects on calcium dynamics

Outside the UAB System

- Cyberplasm (C. Voigt, Univ of California San Francisco, CA; J. Ayers, Northeastern University, MA; Daniel Frankel, Newcastle University, UK)
- Pools of glutamate for exocytotic glutamate release (H.S. Waagepetersen and A. Schousboe; Univ of Copenhagen, Danmark)
- The role of connexin 43 in astrocytic exocytosis (E. Scemes and D.C Spray, Albert Einstein College of Medicine, NY)
- Optogenetic approaches for stimulation of astrocyte in vivo (S. Kasparov, Univeristy of Bristol, UK and P.G. Haydon, Tufts Univ, Boston, MA)
- CNTs in modulation of neuronal growth, astrocytic maturation/stellation and myotube formation; FET interfaces for BMI (R.C. Haddon, Univ of California Riverside, CA)
- CNTs distribution in the brain (J.J. Rodriguez, Univ of the Basque Country, Bilbao, Spain and A. Verkhratsky, Univ of Manchester, UK)
- SNARE complex proteins (R. Zorec, Univ of Ljubljana, Slovenia)
- VGLUTs trafficking in astrocytes (R. Zorec, Univ of Ljubljana, Slovenia; S. Duan, Chinese Academy of Sciences, China)
- The role of presenilins in vesicular trafficking in astrocytes (R. Zorec, Univ of Ljubljana, Slovenia)

- Single molecule measurements of interactions between SNAREs and their associated proteins (U., Mohideen, Univ of California Riverside, CA)
- Nanosieve-based detection of botulinum toxins (A. Gu, Univ Missouri, Columbia, MO)
- Computational analysis of tripartite synapse (E-B. Jacob, Tel Aviv University, Israel)
- Human enteric glial cells tiling/domains (D. Sapunar, Univ of Split, Croatia)
- Mitochondrial Ca^{2+} exit via NCLX regulates astrocytic Ca^{2+} signaling, gliotransmission and proliferation (C. Nolte and H. Kettenmann, MDC-Berlin, Germany, and Israel Sekler, Ben Gurion University, Israel)
- Purinergic status in astrocytes (S. Stojilkovic, NIH)

POZZO-MILLER
Within the UAB System
Alan Percy
John Hablitz
Anne Theibert
Ed Taub / Gitendra Uswatte
Scott Wilson
Lynn Dobrunz

Outside the UAB System
Maurizio Giustetto, University of Torino, Italy.
Arturo Romano, University of Buenos Aires, Argentina.
Gabriela Paglini, Instituto Ferreyra, Córdoba, Argentina.
Kristina Leuner, University of Frankfurt, Germany.
Yong Li, Jiao-Tong University, Shanghai, China.
Takafumi Inoue, Waseda University, Tokyo, Japan.

SONTHEIMER
Within the UAB System
Drs. Nabors and Lahti

Outside the UAB System
Dr. Rich Bridges, University of Montana
Drs. Jeff Rothstein and Rita Sattler, John Hopkins University

THEIBERT
Within the UAB System
Dr. Lucas Pozzo-Miller

VISSCHER
Within the UAB System

- Lesley Ross and Karlene Ball, Psychology Department. We wish to examine how ongoing brain activity as measured with fMRI may be altered after training on a visual processing speed task. This task has been shown to have great behavioral gains for older adults, thought to arise from changes in speed of processing of visual attention, which is likely to be mediated by attention. We have submitted three grants about this general topic. (One was a section of a PO1 proposal; the other was a funded CCTS pilot program proposal. A version of this project, in younger adult

participants, is part of my current RO1 proposal.) Dr. Ross is also involved in training the Macular Degeneration patients for the studies described below and in the Grants section.

- Cynthia Owsley and Dawn DeCarlo, Ophthalmology Department. Both Dr. Owsley and Dr. DeCarlo are involved in the macular degeneration and training project described above and in the Grants section. Dr. Owsley's expertise in training and vision loss and Dr. DeCarlo's clinical expertise with low-vision populations have been critical to examining this question.

- Erwin Montgomery, Neurology Department, and David Knight, Psychology Department. We are planning a study of the safety and efficacy of Deep Brain Stimulation of the anterior cingulum for refractory Post-Traumatic Stress Disorder. Deep brain stimulation of the anterior cingulum has proven very effective for depression. Given the similarities between the problems of depression and post-traumatic stress disorders, and given the severity of symptoms of some patients with post-traumatic stress disorders, deep brain stimulation is thought to be a possible effective treatment. Dr. Montgomery is working through the VA Hospital to perform a pilot experiment, and we are preparing a grant proposal relating to this project. We are currently working through final experimental design and IRB requirements. My collaboration focuses on studying how DBS impacts neural activity and whether EEG or fMRI measures prior to treatment may be used as a predictor of response. We will measure EEG responses to emotionally salient images before and after DBS. In collaboration with David Knight (Psychology), we will measure fMRI associated with fear conditioning and relate these responses to response to DBS.

- Daniel Marson, Neurology Department. Dr. Marson's NIH-funded grant studies the relationship between financial abilities and brain structure and function in participants with mild cognitive impairment. My role in the project is to assist with methods, interpretations and analyses of MRI and fMRI data. We are examining how the integrity of connections among brain networks may predict participants' behavioral scores indicating their financial capacity. I work closely with Dr. Marson's lab members to analyze and interpret their data.

- Ryan Walsh, Neurology Department. Dr. Walsh was an MD/PhD fellow whose work focuses on Parkinson's Disease (PD) and mechanisms of treatment. His current project looks at how functional connectivity among some brain regions thought to play a large role in PD are different between different groups within the affected population and with and without medication. I have worked on his experiment design, getting functional connectivity data analysis running here and determining the origin of some noise impacting these data. Dr. Walsh runs his analyses on the computers in my lab, and Sean Pool, an undergraduate in the lab, helps to run these analyses. He has moved to Las Vegas and in collaboration with Dr. Walsh and Dr. Christi Perkins Hu, my lab is now analyzing the resting state functional connectivity data from this project, and I am the PI on the IRB for these data.

- Frank Skidmore, Neurology Department. Dr. Skidmore studies patients with PD. We are collaborating to examine how functional connectivity is altered with the disease.

<u>Outside the UAB System</u>

- Assistant Professor Angela Gutchess, Brandeis University. I am a collaborator on a funded R21 grant from NIH/NIA to study preservation of social memory with age. Items with socioemotional significance are preserved in older adults' memory relative to items without socioemotional significance. We wonder to what extent ongoing activity representing the socioemotional state of

the subject during the encoding experience influences memory. I am involved with the design of the study and will be involved in fMRI analysis.

- Associate Professor Aaron Seitz, UC Riverside. Dr. Seitz's lab focuses on implicit learning. Our collaborative project examines how ongoing fluctuations in EEG alpha power are influenced by learning. Data are being collected in his lab, and alpha power analyses (on de-identified data) are being performed in my lab.

WADICHE

Outside the UAB System

Dave Poulson, University of Montana Missoula, MT
Anastassios Tzingounis, University of Connecticut, Storrs, CT
Henrique von Gersdorff, Vollum Institute, Portland, OR
Malin Stridh and Helle S. Waagepetersen University of Copenhagen, Copenhagen, Denmark
Rolf Sprengel and Peter Seeburg, Max Planck, Heidelberg, Germany
Shiwei Huang and Erik De Schutter, OIST, Okinawa, Japan

WILSON

Within the UAB System

Dr. Lynn Dobrunz
Dr. Eric Robertson
Dr. Kevin Roth
Dr. Robin Lester
Dr. John Hablitz

Outside the UAB System

Dr. Daniel Finley (Harvard)
Dr. Richard Miller (Northwestern University)
Dr. Jeffery Knobels (Baylor)

APPENDICES

List of Seminar Speakers sponsored by the Evelyn F. McKnight Brain Institute at UAB.

Evelyn F. McKnight Seminars 2012		
01/23/2012	Jeffrey L. Neul, M.D., Ph.D. Associate Professor Baylor College of Medicine	*"Pathophysiology of cardiac arrhythmias in Rett syndrome"*
01/26/2012	Andrew Pieper, M.D., Ph.D. Assistant Professor UT Southwestern Medical Center	*"'Discovery of a Neuroprotective Chemical"*
02/02/2012	Rajesh Kana, Ph.D. Assistant Professor UAB	*"Neural Signatures of Autism"*
02/09/2012	David Knight, Ph.D. Assistant Professor UAB	*"Neural Mechanisms of the Threat-related Emotional Response"*
02/16/2012	Mel Feany, M.D., Ph.D. Associate Professor Harvard Medical School, Brigham and Women's Hospital	*"Genetic analysis of neurodegeneration"*
03/08/2012	Peter W. Kalivas, Ph.D. Porfessor / Co-Chair Medical University of South Carolina	*"Using neuroplasticity to cure addiction"*
03/15/2012	Marcelo A. Wood, Ph.D. Associate Professor University of California, Irvine	*"The role of chromatin modifying enzymes in long-term memory processes"*
03/22/2012	David Katz, Ph.D. Professor Case Western Reserve University	*"Circuit dysfunction and repair in Rett syndrome: What mice are teaching us about the reversibility of autism spectrum disorders"*
04/06/2012	Luis Puelles, M.D., Ph.D. Professor University of Murcia in Spain	*"New concepts on the morphological organization of the forebrain and midbrain"*
04/19/2012	Talene Yacoubian, M.D., Ph.D. Assistant Professor UAB	*"Role of 14-3-3s in Parkinson's Disease"*
09/20/2012	Lawrence Sincich, Ph.D. Assistant Professor UAB	*Orientation Selectivity and Cytochrome Oxidase Architecture in MacaqueV1"*
10/11/2012	Mini Symposium Robert Zorec, Ph.D. University of Ljublijana, Slovenia Jean-Piere Mothet, Ph.D. Marseille University France	 *"The fabrics of astrocytic vesicle traffic in health and disease"* *"Brain D Serine: from release to synaptic functions"*

	Hajime Hirase, Ph.D. RIKEN Brain Science Institute Japan	*"Astrocyte calcium signaling in plasticity of local cortical circuits in vivo"*
	Sergei Kirov, Ph.D. Georgia Health Sciences University Augusta, GA	*"Astrocytes, microglia and neurons in early stroke and traumatic brain injury"*
	Jessica Filosa, M.D., Ph.D. Georgia Health Sciences University Augusta, GA	*"Bi-directional communication at the neurovascular unit: implications for neuronal function"*
	Alexey Semyanov, Ph.D. RIKEN Brain Science Institute Japan	*"Subcellular mechanisms controlling Ca^{2+} dynamics in hippocampal astrocytes"*
	Joanne Nash, Ph.D. University of Toronta Scarborough	*"Understanding mitochondrial pathology in Parkinson's disease: Implications for disease-modifying strategies"*
10/25/2012	Laura Bianchi, Ph.D. Assistant Professor University of Miami	*"Glia/neurons functional interaction: understanding the role of a new player"*
11/08/2012	Ege Kavalali, Ph.D. Professor UT Southwestern Medical Center	*"Parallel Pathways for Neurotransmitter Release and Signaling at Central Synapses"*

ARTICLES AND OTHER NEW ITEMS

UAB News

Sweatt wins international plasticity award

By Bob Shepard
Monday, January 30, 2012

David Sweatt, Ph.D., professor and chair of the UAB Department of Neurobiology, has been awarded the 2012 neuronal plasticity prize from the Fondation IPSEN, an entity of the Fondation de France. Sweatt, who is the director of the Evelyn F. McKnight Brain Research Institute and holds the Evelyn F. McKnight Endowed Chair, will receive the award at the FENS Forum of Neuroscience meeting in Barcelona on July 17, 2012.

Sweatt's contributions in epigenetics and brain function were cited by the administrators of the prize, which is being awarded for the 23rd time.

The Fondation IPSEN Neuronal Plasticity prize is awarded to researchers in recognition of outstanding contributions in the field of neuronal plasticity: development, synaptogenesis, ageing, regeneration, grafts and growth factors. The prize may be shared by several researchers involved in the same research field.

During the past quarter-century, the Fondation IPSEN has organized more than 250 meetings and produced several hundred publications; more than 250 scientists and biomedical researchers have been awarded prizes and research grants.