THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM
University Development

December 31, 2010

Ms. Teresa W. Borcheck
Senior Vice President
Endowment & Foundation Services
SunTrust Bank
Post Office Box 620005
Orlando, Florida 32862-0005

Dear Teresa:

It is my pleasure to once again provide the Evelyn F. McKnight Brain Research Foundation with a stewardship report for The Evelyn F. McKnight Brain Institute at UAB. This report is for the period ending September 30, 2010, and is the first report related to the Foundation's additional commitment of $6 million for the Institute. There is tremendous work reported in the attached materials, and I believe the Foundation will be most pleased with the continuing progress the Institute is experiencing. As requested, the report follows the standards provided to us; if you have any questions or need additional information, please do not hesitate to call me at (205) 937-0177 or Daphne Powell, Director of Stewardship, at (205) 934-1807.

Since the Institute was created in 2004, groundbreaking research has been conducted, and remarkable strides have been taken in identifying the mechanisms that underlie the neurobiology of memory. This effort would not have been possible without the support of the Foundation, and we hope you remain as proud as we are of the incredible work that has already occurred. Please express my gratitude and heartfelt appreciation to the other trustees of the McKnight Brain Research Foundation for your continued support of UAB. We look forward to having you on campus in February 2011. Until then, my best wishes remain with you.

Sincerely,

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

SSK/dbp
Enclosure

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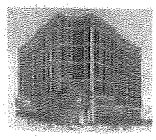
UAB EVELYN F. MCKNIGHT BRAIN INSTITUTE



DEPARTMENT of NEUROBIOLOGY

Annual Report

2010

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
1825 University Boulevard
Birmingham, Alabama
35294

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McKnight Brain Research Foundation
Report Period: 2009/2010
Institution: The Evelyn F. McKnight Brain Institute
At the University of Alabama at Birmingham

CHAIR'S OVERALL REPORT

ANNUAL REPORT

McKnight Brain Research Foundation
Report for Evelyn F. McKnight Brain Institute
University of Alabama at Birmingham
October 2009 – September 2010

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

This report provides an overview and summary of the activities and accomplishments for 2010 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 2010, 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 several 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 a renewed five-year commitment to the Institute.

Highlights for the past year for the Evelyn F. McKnight Brain Institute at UAB include:

- The Institute has added six new McKnight faculty investigators. Two were recruited externally as new faculty members at UAB; two are new Assistant Professors who trained at UAB and are now starting their own independent laboratories; and two are new additions to the Institute that were already at UAB. The new faculty recruits are Gwen King (from Boston University Medical School), Michelle Olsen (from UAB Dept. of Neurobiology), Michelle Gray (from UAB Dept. of Neurology) and David Geldmacher (from UVA Medical School). Dr. Geldmacher is also the new Director of the Division of Memory Disorders and the Collat Scholar in Neurosciences at UAB. The Division of Memory Disorders is based in the Neurology Department and focused on aging-related memory dysfunction. Other new appointees from within UAB are Tara DeSilva (Dept. of Physical Medicine) and Karlene Ball (Chair of the Dept. of Psychology). 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, Physiology & Biophysics, and Psychology). A full listing of the investigators is available under Tab 3.
- One of our Investigators (David Standaert, M.D., Ph.D.) assumed the position of Acting Chair of Neurology. This positive development was precipitated by the promotion of the former Chair of Neurology, Ray Watts M.D. to the position of Dean of the Medical School and Senior V.P. of the University. It is anticipated that the appointment of Dr. Watts to the Dean's position will promote the continued strategic emphasis on developing the neurosciences at UAB.

- The Department of Neurobiology from which the Institute is administered ranked #15 nationally in NIH funding (using the most recently available data, for 2009, from the Blue Ridge Institute for Medical Research website). By this metric we are one of the top-performing departments at UAB and nationally.
- The Institute helped with the successful recruitment of Scott Phillips to be the Scientific Director of the IDDRC Molecular Core. Scott came from the Physiology Department at Vanderbilt and will be entering a non-tenure-track Assistant Professor position in a few months.
- New faculty members Farah Lubin (from BCM/UAB) and Kristina Visscher (from Harvard) have done well in establishing their independent research programs.
- The Civitan International Research Center 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 Civitan research fMRI facility, which is used by several McKnight Investigators.
- The Institute has continued to help build a new undergraduate Neuroscience major, jointly sponsored by the School of Medicine and College of Arts & Sciences. It is the only undergraduate major of its kind in the country and will serve as a recruiting platform for future medical and graduate students interested in memory research.
- McKnight Investigator Robin Lester, Course Director of the Medical Neuroscience course, won the UAB President's Award for Teaching Excellence.
- McKnight Institute Associate Director John Hablitz successfully renewed an NINDS P30, which funds three neuroscience cores at UAB.
- McKnight Investigator Harry Sontheimer received an ARRA P30 for $1M for generating new faculty positions. These funds have gone toward the establishment of three new faculty positions at UAB, in the Departments of Physical Medicine & Rehabilitation (PM&R), Physiology, and Neurobiology. All three new recruits are McKnight Institute Investigators (DeSilva, Olsen, and King).

1. Summary of Scientific Achievements since Last Report

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

This year the Sweatt laboratory continued to investigate whether histone deacetylase inhibitors (HDACi's) can improve memory formation in laboratory models of aging-related memory dysfunction. In one study we published this year in the journal *Neuropsychopharmacology*, the Sweatt group tested the potential for HDACi's to rescue cognitive deficits in a mouse model of aging-related cognitive impairment. Transgenic APPswe/PS1deltaE9 mice demonstrate profound contextual memory impairments beginning at six months of age and are a model of mild cognitive impairment (MCI) and early-stage AD. In our studies we found that chronic HDACi injections (2-3 weeks) did not alter contextual memory formation in normal mice, but had profound effects in these transgenic animals. Injections of sodium valproate, sodium butyrate, or vorinostat (suberoylanilide hydroxamic acid [SAHA]; Zolinza®) completely restored contextual memory in the mutant mice. Further behavioral testing of the HDACi-treated transgenic mice demonstrated that the newly consolidated memories were stably maintained over a two-week period. At six-months of age, we did not detect changes in histone acetylation in APPswe/PS1deltaE9 mutants, suggesting that cognitive deficits in these mice are not caused by global chromatin modifications. These preclinical results indicate that HDACi's are a promising avenue for treating the cognitive deficits associated with aging-related memory loss, MCI, and early-stage AD.

McKnight Investigator Dr. Jacques Wadiche and his laboratory have discovered an important new mechanism for regulating synaptic function in the cerebellum, a finding which has important implications for synaptic plasticity in the CNS. In their studies they focused on synaptic function at climbing fiber synapses at Purkinje neurons, one of the most powerful synaptic connections in the mammalian CNS. They determined that desynchronization of multivesicular glutamate release drives activity-dependent alterations in the kinetics of EPSCs at climbing fiber to Purkinje cell synapses in the cerebellum. Importantly, this change in EPSC kinetics in turn alters the complex spike waveform in a manner that enhances spike propagation. Their finding was the first example of synaptic alterations on the millesecond time scale that contribute to spike generation and synaptic information content. 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. Their paper describing these results is currently in review for the journal *Neuron.*

The laboratory of Dr. Linda Overstreet-Wadiche studies the generation of new neurons in the adult CNS. Most neurons in the brain are generated during embryogenesis. However, neural stem cells in discrete regions of the adult brain continuously produce newborn neurons that can functionally integrate by forming synapses with the existing neural circuitry. One of the regions where adult neurogenesis occurs is the dentate gyrus, an area that is involved learning and memory. The Overstreet-Wadiche laboratory focuses on the mechanisms underlying functional maturation and synaptogenesis of newborn granule cells, the principal neurons in the dentate gyrus. They use a variety of techniques to explore how newborn neurons survive and integrate, and how these processes are modified by aging, exercise and disease. In one series of studies published this year they determined that the initial synaptic input to adult generated granule cells arises from a specific type of hippocampal interneuron that produces an unusual GABA transient. This study was published in Journal of Neuroscience. They are currently following it up by confirming the identity of the interneuron subtype using paired recordings. These studies have very important implications concerning how newly generated neurons in the adult CNS are incorporated into already-existing functional circuits in the hippocampus. In a second new study that they began this year, the Overstreet-Wadiche lab found that environmental enrichment (EE) enhances the synaptic input of adult generated neurons that are in a "critical period" for survival. They are currently testing whether this synaptic input is causally related to EE-induced neuronal survival. These findings have important implications concerning the types of therapeutic approaches that might be useful for promoting the survival of new neurons in the aging CNS.

2. Publications in Peer Reviewed Journals

Investigators at the UAB MBI published a total of 86 research papers, reviews and commentaries in peer-reviewed journals in 2010. The journals in which these papers were published included many of the leading scientific journals in the discipline of neuroscience: *Nature, Science, Nature Neuroscience, Journal of Neuroscience, Biological Psychiatry, Biophysical Journal, J. Physiol., J. Neurochemistry, etc.*

3. Publications (Other)

- **Books**
  None

- **Book Chapters**
  Investigators at the UAB MBI published a total of 13 book chapters in 2010.

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

Investigators at the UAB MBI presented a total of 67 scientific presentations in 2010. UAB MBI Investigators presented their work at numerous prestigious institutions, including: Stanford, Johns Hopkins, Duke, UCSF, and Columbia University. MBI Investigators also presented their work at prominent national meetings including those sponsored by the Society for Neuroscience, Molecular and Cellular Cognition Society, the MBRF/NIA, the Neurochemistry Society, and the University of Oslo.

Please note that the UAB MBI sponsored a number of prominent scientists to come visit UAB and the MBI and give research presentations concerning their own work. A list of MBI-sponsored speakers for 2010 is appended to this report.

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

Investigators at the UAB MBI presented 8 public-forum presentations in 2010.

6. Awards and Honors

Investigators at the UAB MBI received several national-level awards and honors in 2010. Dr. Sweatt received an Ellison Medical Foundation Senior Scholar Award in Aging. Dr. Farah Lubin was selected for the McNulty Award from Civitan International. Dr. Lynn Dobrunz was made a standing member of the MDCN Study Section, and Dr. Farah Lubin was the recipient of a prestigious R00 Transitions to Independence Award from the NIH. In addition, Dr. Linda Wadiche was selected as an Associate Editor of the Journal of Neuroscience.

7. Faculty

The UAB MBI is taking a very selective approach to making appointments of MBI Investigators. The principal criteria for appointments are scientific excellence, research interests and collegiality. The Director strongly feels that focusing on these attributes and selecting only the most outstanding individuals as MBI Investigators is the best strategic plan for the long term.

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 McKnight Investigators.

The two searches for the Kinney Chair and the Geropsychiatry Chair are currently ongoing, with candidates coming to visit this fall and next spring. Dr. David Sweatt is co-chair of the search committees for both these endowed positions.

In addition, a donor commitment for both current use, the Collat Scholar in the Neurosciences, and future use, through the creation of an endowed professorship based in the Neurology Department has been used

for the recruitment of McKnight Investigator Dr. David Geldmacher. Dr. Geldmacher will be 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 here at UAB to help us further strengthen our clinically based studies.

As described above, six new investigators were recruited or appointed to the UAB MBI this past year: Tara DeSilva, Michelle Gray, Gwen King, Michelle Olsen, Karlene Ball, and David Geldmacher. Biosketches for each of the new recruits are appended to this report. These are outstanding additions to our Institute and they greatly strengthen our basic and clinical research portfolio in the area of aging and cognition. A brief summary is given below.

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

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

Michelle Gray, Ph.D. (Recruited to UAB 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

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

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

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

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

A. MBI faculty recruited a total of 11 new graduate students and five new post-doctoral fellows in 2009.

B. Recruiting Initiatives for 2011
As described above we will continue ongoing searches for two senior-level MBI Investigators, each with an endowed chair position, in 2011.

9. Clinical/Translational Programs

A. New Programs
The recruitment of Dr. Geldmacher was described above so I will not reiterate these new initiatives in the clinical/translational area. The addition of Dr. Karlene Ball as an MBI Investigator adds a

prominent, nationally recognized cognitive aging researcher to our ranks. Board members may recall that Dr. Ball was an invited speaker at the first Cognitive Aging Summit - her laboratory performs studies in human subjects aimed at establishing effective training programs to increase cognitive function in normal aging.

B. Update on Existing Clinical Studies
Not applicable

C. New Treatments
Not applicable

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

While we have not yet undertaken any human drug trials, the Sweatt laboratory is undertaking a drug discovery program investigating the use of Histone DeAcetylase (HDAC) inhibitors as cognition enhancing agents. Specific aspects of this project will investigate the viability of HDAC inhibitors as memory improving agents using rodent models of aging-related cognitive dysfunction. The Sweatt laboratory is collaborating with investigators at the EnVivo Pharmaceuticals for these studies, who are providing novel HDAC inhibitors for evaluation, HDAC inhibitors that are not generally available otherwise. Human clinical pilot studies with one of these compounds are now underway.

10. Technology

A. Patent Applications

Not applicable

B. Revenue Generated from Technology

Not applicable

11. Budget Update

A full financial report for 2009/2010 is included as Section 2.

12. Educational Programs Focusing on Age Related Memory Loss

A. Scientific

In 2010 the MBI was instrumental in establishing a new undergraduate honors Neuroscience major at UAB that is the only program like it in the country – a joint offering between the undergraduate College of Arts and Sciences and the School of Medicine. This will be a recruiting platform for future medical and graduate students interested in memory research.

Dr. Sweatt also participated in planning the Cognitive Aging Summit II, co-sponsored by the MBRF and the NIA.

B. Public

Not applicable

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

UAB MBI Investigators have identified a total of 35 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 43 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 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 25 Investigators, with a nicely diverse distribution of Assistant, Associate, and Full Professors including four Department Chairs. Approximately two-thirds (16/25) of the Investigators are new appointees to the Institute since 2006.

We also are progressing nicely in developing our research infrastructure as planned. The 11th 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. 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 MBI's, which in general are not historically strong in the area of mouse genetic engineering.

Another emerging development is that Bob Rich, former Dean of the School of Medicine, retired from that position in 2010. Dr. Rich will continue to serve as a Professor at UAB and an advisor to the President and new Dean of the School of Medicine. As mentioned above the new Dean, Dr. Ray Watts, was recruited from within UAB, and this will ensure continuity of UAB programmatic initiatives. Dr. Watts has assured me that all UAB commitments to the MBI here 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 School of Medicine.

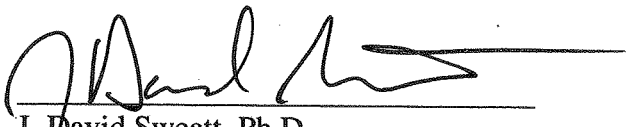
19. Please describe any negative events (loss of personnel, space, budget, etc.) that occurred during the report period and the possible impact on carrying out the Gift Agreement.

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



1/3/11

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

Financial Report

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 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**	**$ 318,542**	**$ 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 Institute Spendable Earnings		$ 55,984			
	Previous MBRF Agreement Residual		$ 406,785			

FY 10 Totals		**$ 1,500,000**	**$ 546,268**	**$ 1,838,285**	**$ 176,558**	**$ 4,892,946**
Grand Totals		**$ 1,500,000**	**$ 546,268**	**$ 1,838,285**	**$ 176,558**	**$ 4,892,946**
	* denotes encumbered endowment match					

MCKNIGHT BRAIN INSTITUTE AT UAB
2010 ANNUAL REPORT
FINANCIAL SUPPLEMENT

	MBRF CONTRIBUTION		*UAB MATCH*		OTHER
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					
10/1/2011					
10/1/2012					
10/1/2013					
Total	**$ 1,000,000**	**$ 500,000**	**$ 2,722,946**	**$ 2,170,000**	**$ 316,041**

Projected FY 10-11 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	$495,000		$78,691		**$573,691**
Recruitment Ads	$5,000				**$5,000**
Other McKnight Brain Institute Support		$111,968			**$111,968**
F. Cleveland Kinney Endowed Chair in Geriatric Psychiatry				$74,014	**$74,014**
Geropsychiatry Research Chair				$102,544	**$102,544**
Total	**$500,000**	**$111,968**	**$78,691**	**$176,558**	**$867,217**

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 $6,367,337 in direct costs and $9,022,400 in total costs broken down as follows:

NIH	$5,907,693 Direct Costs
NSF	$ 174,189 Direct Costs
Other Foundations	$ 285,455 Direct Costs
Total	$6,367,337 in Direct Costs

A detailed report of grant awards is attached.

Department of Neurobiology

Active Extramural Funding

Fiscal Year 2010-2011

Faculty	Role	% Effort	Type of Grant / Grant Number	Agent	Grant Period	Title	Current Annual			All Years		
							Direct Costs	F & A	Total	Direct Costs	F & A	Total
Brenner	PI	44%	R01 NS39055	NIH	08/2/06-01/31/11	Analyses and Applications of GFAP Transcription	269,166	109,764	378,930	1,082,754	492,653	1,575,407
Brenner	PI	27%	P01 NS04280 3	NIH-Wis	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	PI		3P01 NS04280 3-S1	NIH-Wis	09/30/09-08/31/11 - NCE	Alexander Disease: Cellular and Molecular Mechanisms - Administrative Supplement	26,200	12,707	38,907	26,200	12,707	38,907
Brenner	Core Dir	10%	P30 HD03898 5-07	NIH	07/01/08-06/30/13	Intellectual Developmental Disabilities Research Center - Core B	154,319	70,215	224,534	847,472	382,134	1,229,606
Dobrunz	PI	50%	RO1MH6 5238-01A revision	NIH	12/01/02-08//31/11 - NCE	Frequency Dependence of Excitatory Synaptic Transmission	322,067	96,728	418,795	1,197,067	490,478	1,687,545
Hablitz	PI	40%	RO1 NS02237 3 CR	NIH NINDS	04/01/07-03/31/12	Neocortical Epilepsy During Development	218,750	98,438	317,188	1,093,750	492,140	1,585,890
Hablitz	PI	5%	P30 NS04746 6	NIH NINDS	07/1/05-12/01/10	UAB Neuroscience Core Center	328,426	149,434	477,860	1,842,187	706,596	2,548,783
Hablitz	PI	25%	R21NS06 3342	NIH	08/15/08-02/28/11 NCE	Kainate Modulation of Vesicular GABA Release Evoked by Natural Stimulus Patterns	98,438	44,297	142,735	229,688	103,360	333,048
Lester	PI	30%	R01 DA11940 CR	NIH	06/01/04-03/31/11-NCE	Sub-unit Specific Regulation of Neuronal Nictonic Receptors	162,613	56,914	219,527	875,000	315,000	1,190,000
Parpura	PI	20%	New NSF Grant	NSF	09/01/09-08/31/12	Cyberplasm - An autonomous Micro-robot constructed using Synthetic Biology	174,189	80,925	255,114	522,567	242,921	765,488

Pozzo-Miller	PI	40%	R01 NS040593	NIH NINDS	08/02/06-01-31/11	Actions of BDNF on Ca2+ Signals in Hjippocampal Neurons	218,475	99,406	317,881	1,028,997	456,455	1,485,452
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	Core Director	20%	P30 HD038985-07	NIH-NICHD	07/01/08-06/30/13	Intellectual Developmental Disabilities Research Center - Core C	156,533	71,223	227,756	859,631	387,618	1,247,249
Pozzo-Miller - Li	PI		Postdoc Fellow	IRSF	10/01/08-09/30/11	TRPC3-Meidated Membrane Currents as Biosensors of Endogenous BDNF Release: Is BDNF Release Impaired in MECP2 Knockout Mice?	50,000	-	50,000	100,000	-	100,000
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	03/1/07-11/30/11	Properties and Function of Glia Ion Channels	218,750	98,438	317,188	875,000	393,752	1,818,750
Sontheimer	PI		3R01 NS031234 - S2	NIH NINDS	09/01/09-08/31/11	Properties and Function of Glia Ion Channels-Administrative Supplement	138,238	64,168	202,406	138,238	64,168	202,406
Sontheimer	PI		R01 NS052634	NIH-NINDS	08/05/09-07/31/11	Amino-acid Transport and the Biology of Human Gliomas	250,000	116,250	366,250	500,000	232,500	732,500
Sontheimer	PI	0%	1P30 NS069324 -P30 Recruit Center	NINDS	09/30/09-09/29/11	Center for Glial Biology in Medicine Research Recruitment Core Center	500,000	151,125	651,125	1,000,000	302,500	1,302,500
Sontheimer/Parpura	PI/ Mentor		New ABTA Grant	ABTA Foundation	07/01/09-06/30/11	Bradykinin as a Strong Promoter of Motility and Invasion of Glioma Cells	40,000	-	40,000	80,000	-	80,000
Sweatt	PI	40%	R01MH057014 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

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

Current Occupant: John David Sweatt, M.D.

Occupancy Date: February 3, 2006

Total Contributions:	$1,500,000	1
Market Value at 9/30/2010:	$1,418,396	2
Projected Spendable Earnings for FY 2010/11:	$78,690	3

Evelyn F. McKnight Brain Institute Endowed Support Fund

Total Contributions*:	$1,000,000	1
Market Value at 9/30/2010:	$1,009,107	2
Projected Spendable Earnings for FY 2010/11:	$111,462	3

1. Contributions may be added to endowment principal at any time.
2. Market value is the principal and reinvested earnings plus market appreciation.
3. The projected spendable earnings amount was calculated using 5% of a moving market average of the unit value of the University System's Pooled Endowment Fund for the previous twelve quarters ended December 31, 2009.

INSPIRATION UNDERSTANDING SUCCESS INGENUITY INNOVATION

UAB Pooled Endowment Fund
Investment Report

as of June 30, 2010

UAB UNIVERSITY DEVELOPMENT

Investment Report

In 1978, the University's Board of Trustees created The University of Alabama Pooled Endowment Fund (UAPEF) managed by the Chancellor's Office. The Board adopted an investment policy and established an Investment Committee, which oversees investment activities, monitors performance of professional money managers, and ensures the prudent control of the investment of funds. The Investment Committee is responsible for recommending investment objectives and policies and for implementing such policies. The Board seeks to enhance the value of individual endowments by pooling these assets. A pool of assets provides more options for investment, stronger diversification, superior returns, and lower management fees.

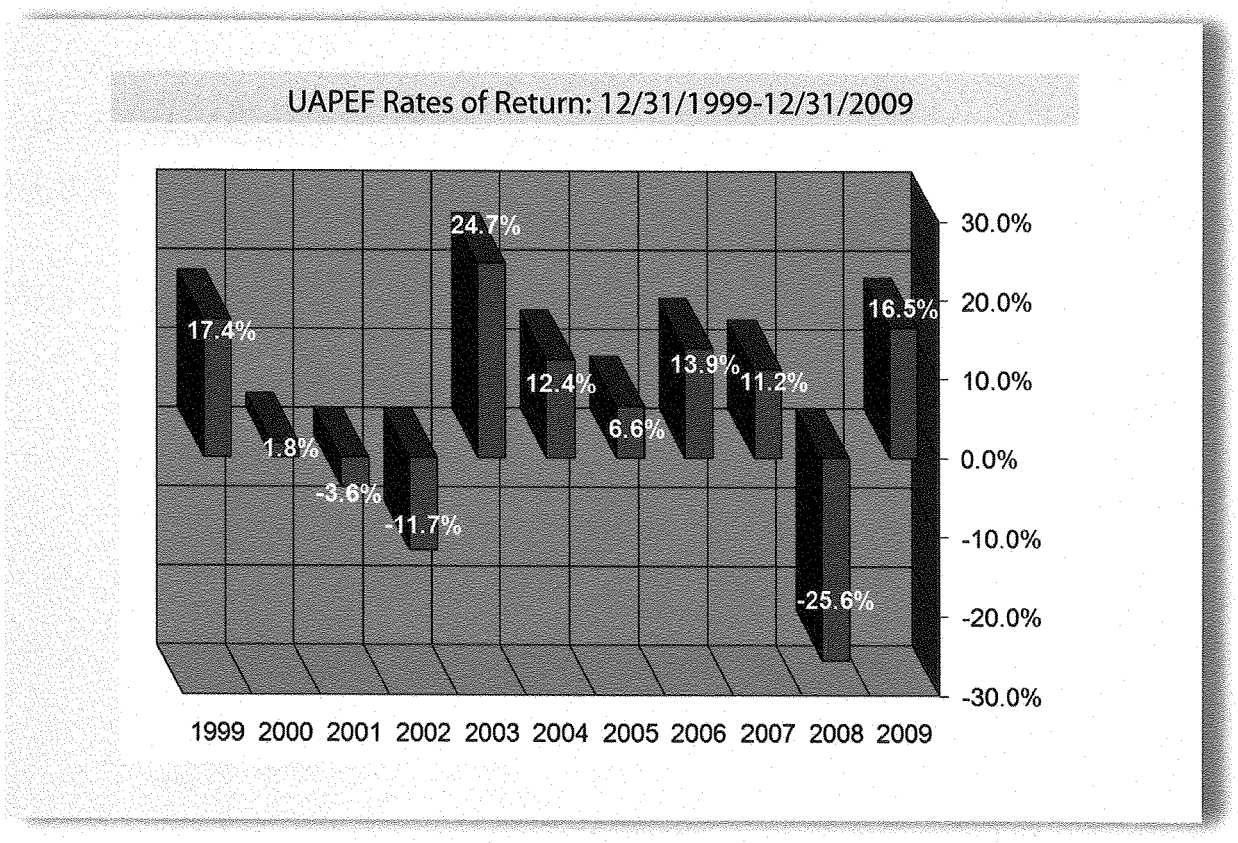
The UAPEF had a ten-year annualized investment return of 3.6% for the period ending December 31, 2009, compared to a return of 1.7% for the custom index.* For the quarter ending June 30, 2010, the UAPEF posted a -5.4% return. The Board of Trustees is committed to a diversified investment strategy in order to preserve the real purchasing power of the principal and to provide a stable source of perpetual financial support to the University.

As of June 30, 2010, the market value of the UAPEF was $820.4 million. Of this amount, 34.2%, or $280 million, is attributable to UAB and the Hospital. As state assistance shrinks and the costs of higher education rise, endowment support becomes more critical to the University's growth and ability to maintain its standards of excellence.

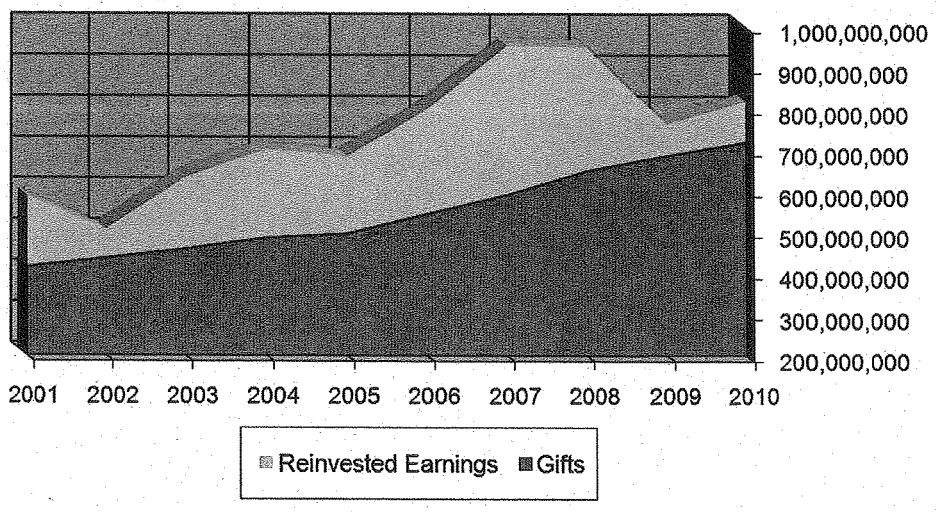
Asset Allocation

The Board seeks superior investment returns through professional money management. Assets of the UAPEF are managed by 34 professional investment firms. The UAPEF also has an investment consultant, Cambridge Associates, with expertise in investment policy development, spending policy analysis, manager evaluation and selection, and performance evaluation. The Board believes multiple external managers provide (1) greater diversification of investment philosophy, judgment, investment opportunity, and risk exposure; (2) a positive influence on performance through long-term competition; and (3) a broader basis on which to compare and judge investment performance.

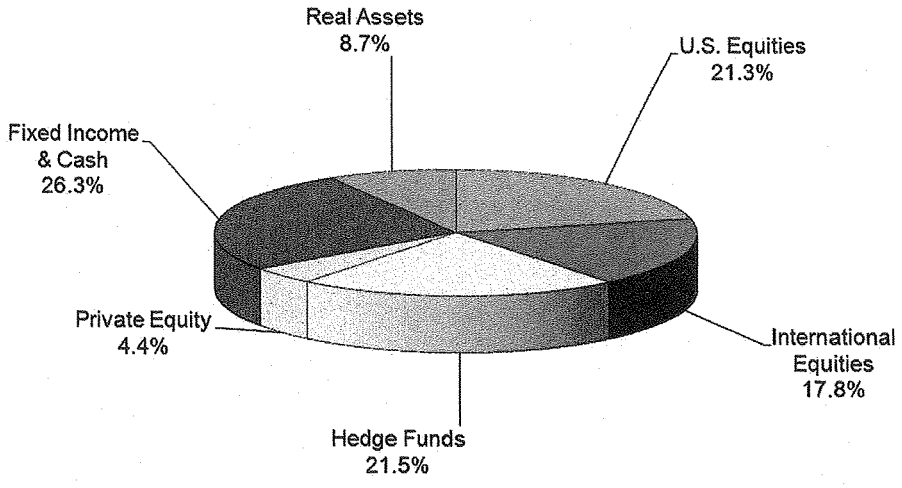
** The custom index is a blend of indices that closely represents the actual UAPEF portfolio and is used as a benchmark for comparison, both in terms of return and risk.*



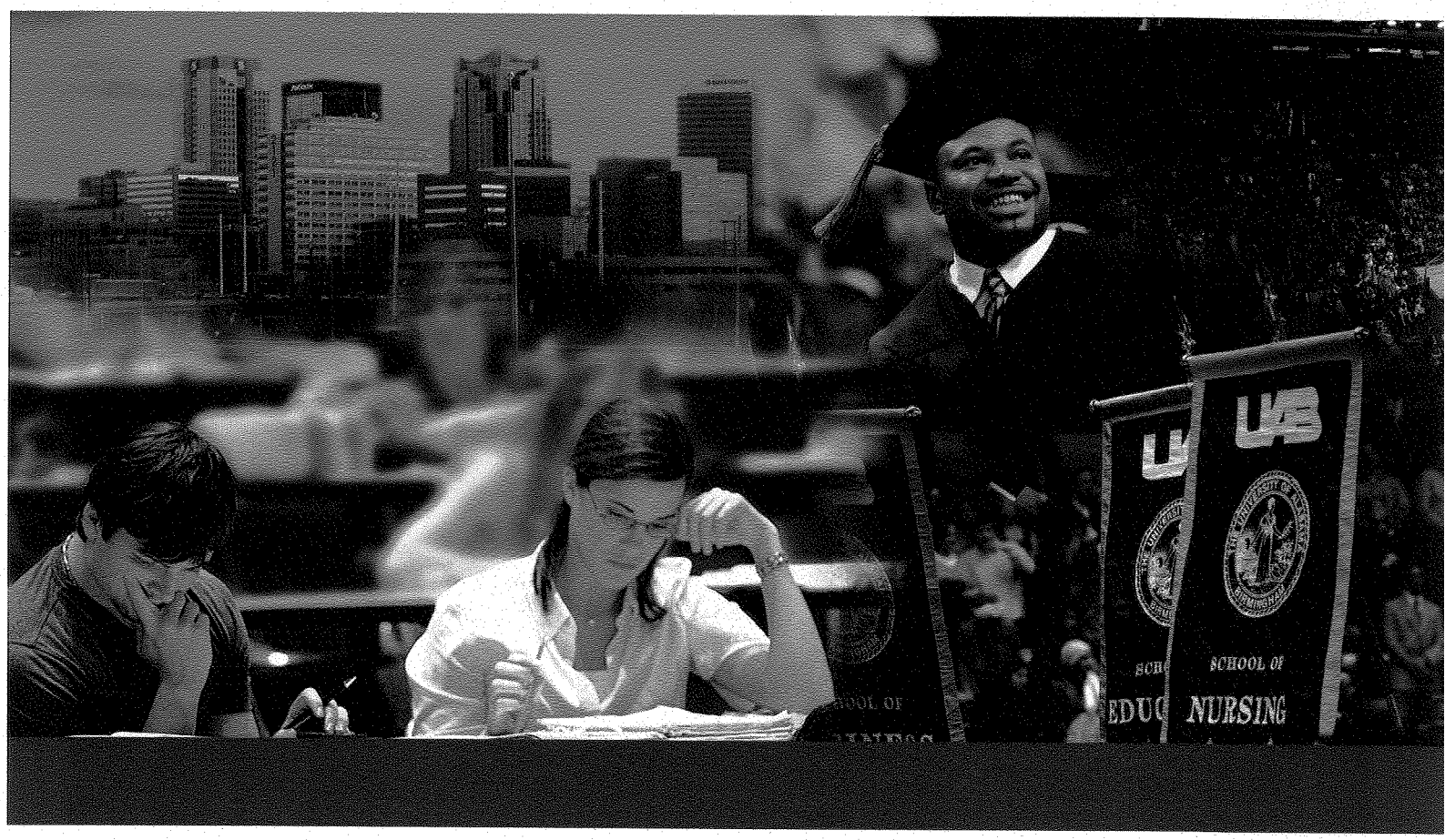
UAPEF Growth in Endowment Funds
June 30, 2001 - June 30, 2010



Asset Allocation at 06/30/2010



KNOWLEDGE SPIRIT ACHIEVEMENT DISCOVERY OPPORTUNITY VISION



UAB UNIVERSITY DEVELOPMENT

Daphne B. Powell
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This publication was produced in house.

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

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

David Geldmacher, M.D. (Recruited to UAB from UVA, arriving 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, Neurobiology
Associate Director, UAB-MBRI
Area of Interest: Modulation of excitability in neocortial circuits

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

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

Associate Professors

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

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

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

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

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

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

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

Michelle Gray, Ph.D. (Recruited to UAB 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

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

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

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

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

Michelle Olsen, Ph.D.
Assistant Professor, Physiology and Biophysics

Area of Interest: Signal transduction mechanisms in the CNS, epigenetics

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

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

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

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

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

Recent UAB McKnight 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 Univ. 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:

Christina 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 Univ. 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 to UAB from Harvard in 2009)
Assistant Professor, PM&R
Area of Interest: Neural-glial signaling mechanisms in the CNS

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

Michelle Gray, Ph.D. (Recruited to UAB 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

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

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

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.

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

SWEATT INDIVIDUAL REPORT

McKnight Brain Research Foundation
Annual Report 2010
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 2010

While a number of discoveries are described in the research publications listed in section 2 below, I will highlight only two of the principal discoveries from the laboratory this year.

One of the most exciting and high-profile projects that we have pursued since I joined the Evelyn F. McKnight Institute concerns our investigations into whether molecular epigenetic mechanisms underlie formation and storage of long-term memory. These studies are particularly exciting because we anticipate that the study of the signaling mechanisms that contribute to long-lasting behavioral change will lead to the identification of novel neuropharmacological targets for drug development in the area of cognitive enhancement with aging.

The biochemical signaling mechanisms underlying the sustenance and perpetuation of long-lasting, experience-dependent functional change in the CNS remain mysterious. Two of our projects over the last year investigated the hypothesis that a potent transcription-regulating mechanism, altered DNA methylation, might serve as a lasting signal in the hippocampus and cortex to subserve persisting alterations in gene expression, cellular properties, and circuit function. Thus in the past year we investigated the role of DNA methylation at the cellular and systems level by investigating experience-driven long-term and short-term changes in DNA methylation in the hippocampus and cerebral cortex.

In one study we tested the specific hypothesis that DNA methylation controls the storage of remote memory in the anterior cingulate cortex. Recent work from several laboratories have demonstrated that remote, i.e. very long-lasting, contextual memories are consolidated and stored in the anterior cingulate cortex. It was intriguing to consider that lasting changes in DNA methylation might contribute to stabilization of remote memory in the cortex, and in one series of experiments we tested whether remote memory formation is associated with altered DNA methylation in the anterior cingulate cortex and whether disrupting cortical DNA methylation leads to remote memory destabilization. We found that this indeed is the case, which led to a publication concerning these findings in *Nature Neuroscience*.

In a second study we collaborated with two laboratories at UCLA (the Fan and Silva labs) in order to use a genetic engineering approach to test directly whether DNA Methyltransferase (DNMT) activity is necessary for hippocampus-dependent long-term memory and long-term synaptic plasticity (LTP). It was already known that DNMT1 and DNMT3a are important DNA methyltransferases that are expressed in postmitotic neurons, but their function in the CNS was unclear. In collaboration with the Fan and Silva labs we generated conditional mutant mice that lack Dnmt1, Dnmt3a or both exclusively in forebrain excitatory neurons and found that only double knockout (DKO) mice showed abnormal long-term plasticity in the hippocampal CA1 region together with deficits in learning and memory. Furthermore, DKO neurons showed deregulated expression of genes, including the class I MHC genes and Stat1, that

are known to contribute to synaptic plasticity. These findings, also published in *Nature Neuroscience*, showed that Dnmt1 and Dnmt3a are required for synaptic plasticity and memory, through their overlapping roles in maintaining DNA methylation and modulating neuronal gene expression in adult CNS neurons.

Overall our work received considerable press attention this year, being profiled in a number of newspaper and magazine articles, including an article published in Science magazine. I also am assisting the National Geographic television channel (NatGeo) with a one-hour program on Memory that will be broadcast next year.

2. Publications in Peer Reviewed Journals

Kilgore, M., Miller, C.A., Fass, D.M., Hennig, K.M., Haggarty, S.J., Sweatt, J.D., and Rumbaugh, G. (2010) Inhibitors of Class 1 Histone Deacetylases Reverse Contextual Memory Deficits in a Mouse Model of Alzheimer's Disease. Neuropsychopharmacology 35:870-80.

Feng, J., Zhou, Y., Campbell, S., Le, T., Li, E., Sweatt, J.D., Silva, A.J., and Fan, G. (2010) Dnmt1 and Dnmt3a are required for the maintenance of DNA methylation and synaptic function in adult forebrain neurons. Nature Neuroscience, 13:423-30.

Penner, M. R., Roth, T. L., Chawla, M. C., Hoang, L. T., Roth, E. D., Lubin, F. D., Sweatt, J.D., Worley, P. F., Barnes, C. A., (2010) Age-related changes in Arc transcription and DNA methylation within the hippocampus. Neurobiol. Aging. in press.

Hernandez, C.M., Kayed, R., Zheng, H., Sweatt, J.D., and Dineley, K.T. J. (2010) Loss of {alpha}7 nicotinic receptors enhances {beta}-amyloid oligomer accumulation, exacerbating early-stage cognitive decline and septohippocampal pathology in a mouse model of Alzheimer's Disease. J. Neurosci. 30:2442-2453.

Gupta, S., Kim, S.Y., Artis, S., Molfese, D.L., Schumacher, A., Sweatt, J.D., Paylor, R.E., Lubin, F.D. (2010) Histone methylation regulates memory formation. J. Neurosci. 30:3589-99.

Polter, A., Beurel, E., Yang, S., Garner, R., Song, L., Miller, C.A., Sweatt, J.D., McMahon, L., Bartolucci, A.A., Li, X., and Jope, R.S. (2010) Deficiency in the Inhibitory Serine-Phosphorylation of Glycogen Synthase Kinase-3 Increases Sensitivity to Mood Disturbances. Neuropsychopharmacology, 35:1761-74.

Miller, C.A., Gavin, C.F., White, J.A., Parrish, R.R., Honasoge, A., Yancey, C.R., Rivera, I.M., Rubio, M.D., Rumbaugh, G, and Sweatt, J,D. (2010) Cortical DNA methylation maintains remote memory. Nat Neurosci. 13:664-6.

Xie, Z., Cahill, M.E., Radulovic, J., Wang, J., Campbell, S.L., Miller, C.A., Sweatt, J.D., and Penzes, P. (2010) Hippocampal phenotypes in kalirin-deficient mice. Mol Cell Neurosci. In press.

Lee, S.E., Simons, S.B., Heldt, S.A., Zhao, M., Schroeder, J.P., Vellano, C.P., Cowan, D.P., Ramineni, S., Yates, C.K., Feng, Y., Smith, Y., Sweatt, J.D., Weinshenker, D., Ressler, K.J., Dudek, S.M., Hepler, J.R. (2010) RGS14 is a natural suppressor of both synaptic plasticity in CA2 neurons and hippocampal-based learning and memory. Proc Natl Acad Sci U S A. 107:16994-8..

Penner, M., Roth, T.L. and Sweatt, J.D. (2010) An epigenetic hypothesis of aging-related cognitive dysfunction. Frontiers in Aging Neuroscience. 2, 9 doi:10.3389/fnagi.2010.00009 (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2874394/)

Roth, T.L. and Sweatt, J.D. (2010) Epigenetic marking of the BDNF gene by early-life adverse experiences. Hormones and Behavior, in press.

Sweatt, J.D. (2010) Epigenetics and cognitive aging. Science 328:701-2.

Day, J.J. and Sweatt, J.D. (2010) Epigenetic modifications in neurons are essential for formation and storage of behavioral memory. Neuropsychopharmacology Reviews, in press.

Roth, T.L., Roth, E.D., and Sweatt, J.D. (2010) Epigenetic regulation of genes in learning and memory. Essays in Biochemistry, 48:263-74..

Day, J.J. and Sweatt, J.D. (2010) DNA methylation and memory formation. Nature Neuroscience, 13:1319-23.

3. Publications (other)

Books
None

Book Chapters
Roth, T., Roth, E., and Sweatt, J.D. Epigenetics of Memory Processes. in press in the Elsevier volume Handbook of Epigenetics: The New Molecular and Medical Genetics.. Trygve Tollefsbol, Ed.

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

2010
Experimental Biology Meeting, invited speaker
University of Maryland Program in Neuroscience, Baltimore
Johns Hopkins, Department of Neurology
ISDN meeting, Lisbon, plenary speaker
Columbia University, Dept of Pathology and Cell Biology
Duke University, Duke Institute for Brain Sciences
New York Academy of Sciences, Behavioral Epigenetics Meeting invited speaker
Cognitive Aging Summit, Washington DC invited speaker
Gladstone Institute, UCSF

Invited for 2011
University of Virginia, Neuroscience Graduate Program
Fondation Ipsen, Paris, plenary speaker
UC Irvine, CNLM seminar series
Neurizons Meeting, University of Gottingen, plenary speaker
Vanderbilt University, Neuroscience Program
Broad Institute, Harvard/MIT
Keystone Conference on Epigenetics, plenary speaker

University of Illinois at Chicago, Neuroscience Program

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

Speaker, Redstone Club of Birmingham
Speaker, Rotary Clubs Coins for Alzheimer's Research Trust Board

6. Awards and Honors

Editorial Board, Biological Psychiatry, 2010 – present

Faculty of 1000 (Cognitive Neuroscience), 2010 - present

NIH Grant MH57014 - Biochemical Mechanisms for Long-term Potentiation
D. Sweatt PI, 05/01/10 - 4/30/15, $1,645,000 total direct costs

Ellison Medical Foundation Senior Scholar Award in Aging
9/1/10 – 8/31/14 $600,000 total direct costs

International Rett Syndrome Foundation Grant - MeCP2 in Cognitive Function in the Adult Nervous System
D. Sweatt PI, 10/01/10 - 09/30/12, $90,910 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, Iva Matthews and Garrett Kaas. I also recruited one new Ph.D. graduate student to the lab, Frankie Heyward, along with two undergraduate Neuroscience Honors BS degree students, Kelsey Patterson and Sonda Sengupta.

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

Iva Matthews will be joining the laboratory in December and is currently a graduate student in Dr. Cheryl McCormick's Developmental Neuroendocrinology lab at Brock University, Canada. Iva has her own post-doctoral funding from the Canadian government; a Fellowship from the Natural Sciences and Engineering Research Council (NSERC). Iva's project in the lab will be to investigate the role of DNA methylation in cortical memory storage.

Garrett Kaas will be joining the laboratory in March 2011 and is currently a Ph.D. candidate in the Interdisciplinary Program in Genetics at the University of Iowa, performing his thesis work in the lab of Dr. Toshihiro Kitamoto. His Ph.D. project involves determining the mechanism of lithium's action in the nervous system employing a unique lithium-responsive *Drosophila* neurological mutant named *Shudderer*. Garrett will work on determining the biochemical mechanisms of active DNA demethylation in neurons.

Frankie Heyward is a Ph.D. student in the UAB Neuroscience Graduate Program, working on metabolic control of hippocampal DNA methylation and hippocampus-dependent memory formation. Frankie received his BS degree from the University of Delaware.

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. We published our first jointly-authored papers this year.

University of Florida – We are continuing our collaboration with Tom Foster to investigate alterations in chromatin structure and histone post-translational modifications in memory-impaired aged rats.

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

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

Emory – collaborating with Steve Traynelis on Protease Activated Receptor 1 (PAR1) in plasticity and memory.

Case Western – we have a long-standing collaboration with Gary Landreth concerning generation and characterization of ERK2 MAPK isoform-specific knockout mice.

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

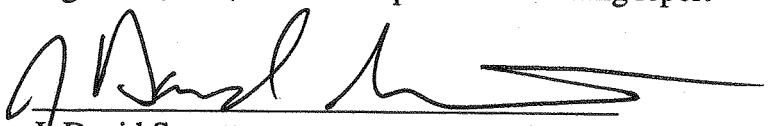
University of Maryland – we are collaborating with Susan Dorsey to investigate BDNF gene methylation in spinal cord plasticity.

University of South Florida – we are collaborating with David Diamond on a project investigating BDNF gene methylation in a model of PTSD.

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

EnVivo Pharmaceuticals – we are collaborating on a project for evaluating next-generation histone de-acetylase inhibitors as memory-enhancing agents. One of these novel compounds is entering human trials.

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 2010

BRENNER

Analysis of expression of transgenes driven by GFAP promoters carrying various specific mutations in putative transcription factor binding sites indicates that conclusions based on cell culture experiments are often faulty. Most striking, a conserved AP-1 binding site thought critical for GFAP expression appears to be completely dispensible.

Previously 5 phosphorylation sites had been identified in GFAP by using standard in vitro labeling and site specific antibodies. All these sites are in the head domain of the protein, and involve serines or threonines. By using mass spectroscopy we have now identified 19 new phosphorylation sites that extend throughout the rod and tail domains and include tyrosine residues.

DOBRUNZ

We have shown that short-term plasticity causes a reduction of the relative strength of excitatory inputs to CA1 interneurons vs. pyramidal cells during high frequency stimuli of physiologically-derived input patterns. Our manuscript on this work is in revision at Hippocampus.

In collaboration with Scott Wilson, we have discovered that the deficit in short-term plasticity at hippocampal synapses in the ataxia mice is caused by a 50% decrease in the number of synaptic vesicles, rather than by a change in the initial release probability of the synapses. This is caused by a non-catalytic activity of Usp14 that controls the rate of protein degradation by the proteasome. This is a novel mechanism of regulating synaptic function and plasticity. Two manuscripts are nearly complete and will be submitted soon.

HABLITZ

A key research accomplishment was the discovery of a new class of cells in rat neocortex. In areas of dysplastic cortex near an experimentally induced microgyrus, a group of layer 5 pyramidal cells have dendrites with distinctly abnormal dendritic arbors. The role of these cells in epileptogenesis is under investigation. In addition, we have observed that function hyperpolarization-activated non-specific cation (HCN) channels are downregulated in dysplastic cortex. The role of changes in intrinsic excitability mediated by HCN channlesin cortical cells is being examined.

LESTER

Demonstration that chronic nicotine in pregnant rats leads to a decrease in newborn cells in the dentate gyrus of offspring

Proof-of-Concept that alteration of inhibition in the dentate gyrus can lead to altered synaptic transmission in CA1 via the CA3 region of the hippocampus.

LUBIN

My research accomplishments for 2009 through 2010 include publishing (7), serving as Ad-hoc reviewer for several peer-reviewed journals (8), and presenting my work at several scientific seminars or workshops (8).

In addition to the journal articles, abstracts and awards listed below, 4 platform presentations and 7 poster presentations of my work were presented at Universities throughout the US or at national and international conferences over the past year.

Excitingly, my work has been internationally recognized and reviewed in more than 10 magazines and/or articles over the past year.

OVERSTREET-WADICHE

We determined that the initial synaptic input to adult generated granule cells arises from a specific type of hippocampal interneuron that produces an unusual GABA transient. This study was published in Journal of Neuroscience. We are following it up by confirming the identity of the interneuron subtype using paired recordings. We have submitted a SFN abstract about this project.

We found that environmental enrichment (EE) enhances the synaptic input of adult generated neurons that are in a "critical period" for survival and we're currently testing whether this synaptic input is causally related to EE-induced survival. We have submitted an SFN abstract about this project.

We initiated a new collaboration with Candace Floyd to investigate cellular changes in the dentate gyrus following mild traumatic brain injury (mTBI). Our preliminary studies indicate that mTBI dramatically enhances neurogenesis, without evidence for dysregulation of neuronal maturation. We are preparing a manuscript and an RO1 application for this project.

PARPURA

We made the first characterization of the G-protein-coupled receptor trafficking in astrocytes. We monitored the trafficking of recombinant fluorescent protein chimeras of the cannabinoid receptor 1 that is thought to be expressed natively in astrocytes and play a modulatory role in the long-term potentiation.

POZZO-MILLER

The first direct and physiological evidence of activity-dependent release of endogenous BDNF. Mossy fibers release BDNF onto CA3 pyramidal neurons and activate TRPC3 channel-mediated currents and intracellular Ca^{2+} transients. Brief bursts of activity-dependent BDNF release trigger a long lasting depression of synaptic transmission at MF-CA3 synapses.

The first description that hippocampal slices from *Mecp2* mutant mice are hyperexcitable, which may explain seizures in these mice and Rett syndrome individuals. The origin of this hyperexcitability is a hyperactive CA3 region.

The first demonstration that BDNF increases quantal transmitter release onto CA1 pyramidal neurons through the activation of presynaptic TRPC channels by presynaptic intracellular Ca^{2+} mobilization, including direct visualization of vesicular fusion by multiphoton imaging of FM1-43 in hippocampal slices.

SONTHEIMER

We were able to implement a continuous EEG-video monitoring laboratory that allowed us to monitor ~100 tumor bearing mice for evidence of seizures followed by recordings from brain slices. These allowed us to establish that tumor associated epilepsy is caused by glutamate release via the system xc cytine-glutamate transporter. This data will be submitted to Nature Medicine shortly.

We showed in a study published in Brain that acute spinal cord injury causes the wide-spread and persistent loss of Kir4.1 and Glt-1 from astrocytes and that this loss can be partially rescued if animals are treated with estrogen

THEIBERT
Our laboratory has demonstrated that centaurin alpha-1 (ADAP1) and centaurin gamma-2 (AGAP1), an autism susceptibility gene, are PI 3-kinase targets and Arf GAPs that control dendritic differentiation and vesicular trafficking in neurons. We are currently testing whether centaurins function in BDNF trafficking in dendrites, and if BDNF trafficking and centaurins are affected in neurons in mouse models of neurodevelopmental diseases.

VISSCHER
Lab setup for both EEG and fMRI data collection and data analysis. Set up EEG rig and simultaneous eye tracking. Designed and set up apparatus for simultaneous audio and video presentation and eyetracking in the fMRI scanner that does not cause fMRI noise.

Collected EEG data for an experiment comparing alpha activity in older adults vs. younger adults. Preliminary results indicate that older adults do not show as strong modulation in alpha-band activity as do younger adults. More older adult data is needed to complete the dataset.

Began recruitment and pilot data acquisition for study on Macular Degeneration. Developed protocols, developed collaborations with UAB faculty with expertise with this patient population, wrote stimulus generation scripts and developed recruitment avenues for a study examining how ongoing activity in visual cortex changes with deprivation of input for long periods after age-related macular degeneration.

WADICHE
We determined that desynchronization of multivesicular glutamate release drives activity-dependent alterations in the kinetics of EPSCs at climbing fiber to Purkinje cell synapses in the cerebellum. Importantly, this change in EPSC kinetics in turn alters the complex spike waveform in a manner that enhances spike propagation. This is the first example of synaptic alterations on the millesecond time scale that contribute to spike generation and information content. We have submitted a SFN abstract about this project and have a manuscript nearly completed.

We found that the expression level of the EAAT4 transporter on Purkinje cell dendrites controls the extracellular level of glutamate. These results show that endogenous regulation of transporters in different cerebellular compartments have physiological significance in regulating signaling between neurons and glia. We have submitted an SFN abstract about this project and have a manuscript that is in review.

It has been reported that a major mechanism that contributes to GABA synthesis and synaptic release depends on uptake of glutamate by transporters located on presynaptic terminals. However, our preliminary studies indicate that in the cerebellum, this mechanism of GABA release is not used. Rather, glutamate transport blockers inhibit GABA release by alternative mechanisms that involve alterations in the tonic level of extracellular glutamate and indirect pharmacological effects of the blockers.

WILSON
Determined that loss of ubiquitin is causative to the motor endplate disease in the Usp14 deficient mice.

Determined that Usp14 can regulate proteasomal function.

2. Publications in Peer Reviewed Journals

BRENNER

Meisingset, T.W., Risa, Ø., Brenner, M., Messing, A. and Sonnewald, U. (2010). Alteration of glial-neuronal metabolic interactions in a mouse model of Alexander disease. Glia, 58:1228–1234.

Cho, W., Brenner, M., Peters, N. and Messing, A. (2010) Drug Screening to Identify Suppressors of GFAP Expression. Hum Mol Gen. 19:3169-3178.

HABLITZ

Hablitz, J.J. and Yang, J. Abnormal pyramidal cell morphology and HCN channel expression in cortical dysplasia. Epilepsia 2010, 51: 52-56.

Mathew, S.S. and Hablitz, J.J. Presynaptic NMDA receptors mediate long term potentiation of GABAergic synapses in developing rat neocortex. Neuropharmacology

LUBIN

S. Gupta, S.Y. Kim, S. Artis, D.L. Molfese, A. Schumacher, J.D. Sweatt, R.E. Paylor, and F. Lubin. Histone Methylation regulates memory formation. 2010, J. Neurosci. March 10, 30(10):3589-3599.

R.R. Parrish, S. Gupta, and F. Lubin. 2010. The epigenetics of memory storage in the brain. Cell Science, In press.

N.M. Grissom and F. D. Lubin. 2009. The dynamics of HDAC activity on memory formation. Cell Science, Jul 27;6(1):44-48.

Penner MR, Roth TL, Chawla MK, Hoang LT, Roth ED, Lubin F., Sweatt JD, Worley PF, Barnes CA. Age-related changes in Arc transcription and DNA methylation within the hippocampus. 2010, Neurobiol. of Aging, Feb 26.

T.L. Roth, F. D. Lubin, M. Sodhi, and J.E. Kleinman. 2009. Epigenetics Mechanisms in Schizophrenia. Biochim Biophys Acta. Sep;1790(9):869-77.

OVERSTREET-WADICHE

Lucas EK, Markwardt SJ, Gupta S, Meador-Woodruff JH, Lin JD, Overstreet-Wadiche L, Cowell JD (2010) Parvalbumin Deficiency and GABAergic Dysfunction in Mice Lacking PGC-1α. *Journal of Neuroscience*, 30:7227-35.

Markwardt SJ, Wadiche JI, Overstreet-Wadiche L (2009) Input specific GABAergic signaling to newborn neurons in adult dentate gyrus. *Journal of Neuroscience*, 29: 15063-15072.

PARPURA

JOURNAL ARTICLES (Technical/Refereed):
Published:
Lee, W., Parpura V. (2009) Micropatterned substrates for studying astrocytes in culture, Front Neurosci, doi:10.3389/neuro.01.033.2009 (7 pp)

Osborne K.D., Lee W., Malarkey E.B., Irving A.J., Parpura V. (2009) Dynamic imaging of cannabinoid receptor 1 vesicular trafficking in cultured astrocytes. ASN Neuro, 1(5). pii: AN20090040. doi: 10.1042/AN20090040 (14 pp).

Parpura V., Zorec, R. (2010) Gliotransmission: Exocytotic release from astrocytes. Brain Res Rev. 63: 83-92. (e-pub before print 2009 Nov 27)

Parpura V., Baker B.J., Jeras M., Zorec R. (2009) Regulated exocytosis in astrocytic signal integration, Neurochem Int (2010 Feb 13. [Epub ahead of print])

Verkhratsky A., Parpura, V., Rodríguez J.J. (2010) Where the thoughts dwell: The physiology of neuronal-glial "diffuse neural net". Brain Res Rev. (2010 May 20. [Epub ahead of print])

Liu W., Parpura, V. (2010) SNAREs: Could they be the answer to an energy landscape riddle in exocytosis? ScientificWorldJournal 10, 1258–1268. DOI 10.1100/tsw.2010.137.

Verkhratsky A., Parpura, V. (2010) Recent advances in (patho)physiology of astroglia. Acta Pharmcol Sin.

In Press.
Losón, O.C., Ha, C.H., **Parpura, V.** (2010) Age-dependent spatial segregation of synaptobrevin 2-containing vesicles in astrocytes. J Neurochem, In Press.

Lalo, U., Pankratov, Y., **Parpura, V.,** Verkhratsky, A. (2010) Ionotropic receptors in neuronal-astroglial signalling: What is the role of "excitable" molecules in non-excitable cells. Biochim Biophys Acta, (2010 Sep 24 [Epub ahead of print]) In Pres

Roman, J.A, Niedzielko, T.A., Haddon, R.C., **Parpura, V.,** Floyd, C.L. (2010) Single-Walled Carbon Nanotubes Chemically-Functionalized with Polyethylene Glycol Promote Tissue Repair in a Rat Model of Spinal Cord Injury. *J Neurotrauma.* In Press

Reyes, R.C., Perry, G., Lesort, M., **Parpura, V.** (2010) Immunophilin Deficiency Augments Ca^{2+}-Dependent Glutamate Release from Mouse Cortical Astrocytes. Cell Calcium, In Press

Parpura , V., Grubišić, V., Verkhratsky, A. (2010) Ca^{2+} sources for the exocytotic release of glutamate from astrocytes. Biochim Biophys Acta, (2010 Nov 27. [Epub ahead of print]) In Press.

POZZO-MILLER
a) Accepted
Li Y, G Calfa, T Inoue, M D Amaral & L Pozzo-Miller (2010). Activity-dependent release of endogenous BDNF from mossy fibers evokes a TRPC3 current and Ca2+ elevations in CA3 pyramidal neurons. Journal of Neurophysiology 103: 2846-2856.

Khoo NKH, CR White, L Pozzo-Miller, F Zhou, C Constance, T Inoue, RP Patel & DA Parks (2010). Dietary flavonoid quercetin stimulates vasorelexation in aortic vessels. Free Radical Biology & Medicine 49: 339-347.

Chapleau CA, GD Calfa, MC Lane, JL Larimore, AJ Albertson, S Kudo, DL Armstrong, AK Percy & L Pozzo-Miller (2009). Dendritic spine pathologies in hippocampal pyramidal neurons from Rett syndrome brain and after expression of Rett-associated MECP2 mutations. Neurobiology of Disease 35: 219-233.

Larimore JL, CA Chapleau, S Kudo, A Theibert, AK Percy & L Pozzo-Miller (2009). Bdnf overexpression in hippocampal neurons prevents dendritic atrophy caused by Rett-associated MECP2 mutations. Neurobiology of Disease 34: 199-211.

Chapleau CA, JL Larimore, A Theibert & L Pozzo-Miller (2009). Modulation of dendritic spine development and plasticity by BDNF and vesicular trafficking: Fundamental roles in neurodevelopmental disorders associated with mental retardation and autism. Journal of Neurodevelopmental Disorders 1: 185–196.

Hablitz JJ, SS Mathew & L Pozzo-Miller (2009). GABA vesicles at synapses: are there two distinct pools? The Neuroscientist 15: 218-224.

Amaral MD & L Pozzo-Miller (2009). The dynamics of excitatory synapse formation on dendritic spines. Cell Science Reviews 5 (4): 19.

b) Submitted

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. Under revision for Journal of Cell Science.

c) Published Abstracts

Pozzo-Miller, L, M Amaral, T Inoue, J Hablitz & G Calfa (2010). Hippocampal slices from Mecp2 null mice are hyperexcitable due to impaired GABAergic inhibition: implications for Rett syndrome. FENS Abstracts, vol. 5, 105.12.

Treiber K, M Amaral, S Rudolph, G Calfa & L Pozzo-Miller (2009). The TRPC6 channel activator hyperforin increases dendritic spine density and activates a membrane current associated with Ca2+ elevations in hippocampal CA1 pyramidal neurons. Society for Neuroscience Abstracts 818.6.

SONTHEIMER

Habela, C.W., Ernest, N.-J, Swindall, A. and Sontheimer H. Chloride accumulation drives volume dynamics underlying cell proliferation and migration. J. Neurophsiol, 101: 750-757, (2009). PMID: 19036868.

Chung. W.J. and Sontheimer H.Sulfasalazine inhibits the growth of primary brain tumors independent of Nuclear factor- B. J. Neurochemistry, 110: 182-192, (2009). PMID 19457125

McCoy, E., and Sontheimer, H. MAPK induces AQP1 expression in astrocytes following injury. Glia, July 16, 2009, PMID: 19610096.

Sims, B., Clarke, M., Njah, W., Hopkins, E.S, and Sontheimer, H. Erythropoietin-induced Neuroprotection Requires Cystine Glutamate Exchanger Activity. Brain Res.,1321: 88-95 (2010).

Olsen, M.L., Campbell, S, McFerrin, M., Floyd, C. and Sontheimer H. spinal cord injury causes a wide-spread, persistent loss of Kir4.1 and GLT-1 in vivo: potential benefits of treatment with 17-estradiol. Brain. 133: 1013-1025 (2010).

Cuddapah, V. and Sontheimer, H. Molecular interaction and functional regulation of ClC-3 by Ca2+/calmodulin-dependent protein kinase II (CaMKII) in human malignant glioma. J. Biol. Chemistry, 285: 11188-11196 (2010).

McCoy, E., and Sontheimer, H. Water Permeability Through Aquaporin-4 is Regulated by Protein Kinase C and Becomes Rate-Limiting for Glioma Invasion. Neuroscience, in press.

Bomben, V. and Sontheimer, H. Disruption of Transient Receptor Potential Canonical 1 Channel causes incomplete cytokinesis and slows the growth of human malignant gliomas. GLIA, in press.

Fabian, A., Fortmann, T., Bomben V.C., Sontheimer H., Schwab, A. Chemotaxis towards fibroblast growth factor-2 requires Transient Receptor Potential Canonical channel 1 activity. J. Physiol., in press.

Hass, B., and Sontheimer, H. Inhibition of the Sodium-Potassium-Chloride Cotransporter Isoform-1 Reduces Glioma Invasion. Cancer Research, in press.

Ogunrinu, T., and Sontheimer, H. The L-Cystine/L-Glutamate exchanger, system xc- supports glioma growth under hypoxic conditions, J. Neurochemistry, submitted.

Montana, V and Sontheimer, H. Bradykinin promotes the chemo-tactic invasion of primary brain tumors. Cancer Research, submitted.

Bomben, V.C., Barclay, T.T., and Sontheimer H. Transient receptor potential canonical channels are essential for chemotactic migration of human malignant gliomas. J. Biol. Chemistry, submitted.

THEIBERT

Larimore, J., Chapleau, C., Kudo, S., Theibert, A., Percy, A. and Pozzo-Miller, L. BDNF overexpression in hippocampal neurons prevents dendritic atrophy caused by Rett-associated MECP2 mutations. Neurobiol. Dis. 34:199-211. 2009.

Chapleau, C., Larimore, J., Theibert, A. and Pozzo-Miller, L. Modulation of dendritic spine development and plasticity by BDNF and vesicular trafficking: fundamental roles in neurodevelopmental disorders associated with mental retardation and autism. J. Neurodev Disord. 1:185-196. 2009.

Larimore, J., Chapleau, C., Moore, C., Worth, S., Rolle, I., Nie, S., Pozzo-Miller, L. & Theibert, A. The Arf1 GAP AGAP1 regulates neuronal differentiation. Under review- J. Neurochem.

Larimore, J., Ewell, S., Markwardt, S., Moore, C., Hermann-Gerdes, H., Faundez, V. and Theibert, A. The Arf GAP ADAP1 functions in secretory granule trafficking in neuronal cells. Submitted.

VISSCHER

Viswanathan, S., Perl, D., Visscher, K.M., Kahana, M.J., Sekuler, R. (2010). Homogeneity computation: How inter-item similarity in visual short term memory alters recognition. Psychonomic Bulletin & Review, 17(1): 59-65.

WADICHE

Markwardt SJ, Wadiche JI, Overstreet-Wadiche L (2009) Input specific GABAergic signaling to newborn neurons in adult dentate gyrus. Journal of Neuroscience, 29: 15063-15072.

WILSON

-Chen, P.C., Qin, L.C., Walters, B., Dobrunz, L., Wilson, J.A., Mei, L., and Wilson, S.M. The proteasome-associated deubiquitinating enzyme Usp14 is essential for the maintenance of synaptic ubiquitin levels and the development of neuromuscular junctions. J. Neurosci 29:10909-19. PMCID: PMC2766780

-Lappe-Siefke, C., Löbrich, S., Hevers, W., Schweizer, M., Fritschy, J.M., Eilers, J., Wilson, S.M., and Kneussel, M. Ax^J mutation of the ubiquitin-specific protease 14 gene alters *in vivo* $GABA_A$ receptor $\alpha 1$ subunit surface expression and Purkinje cell function. PLoS Genet. 5(9):e1000631. PMCID: PMC2744266

Lee, B.H., Lee, M.J., Park, S., Gartner, C., Oh, D.C., Chen, P.C., Hanna, J., Gygi, S.P., Wilson, S.M., King, and R.W., Finley, D. 2010. Enhancement of proteasome activity by a small molecule inhibitor to Usp14. Nature In press.

Under Review

Chen, P.C. Bhattacharyya, B., Hanna, J., Minkel, H., Wilson, J.A., Finley, D., Miller, R.M., and Wilson, S.M. Ubiquitin homeostasis is critical for synaptic development and function. Submitted to Nature Genetics.

3. Publications – Other

BRENNER
Flint, D. and Brenner, M. (in press) Alexander disease, In Naidu, S., *Leukodystrophies*), MacKeith Press, London.

DOBRUNZ
H.Y. Sun and L.E. Dobrunz. Differences in short-term plasticity cause a reduction in excitatory drive onto CA1 interneurons relative to pyramidal cells during temporally complex input patterns. Hippocampus, in revision.

HABLITZ
Hablitz, J.J. Dopamine modulation of neurotransmission: Relationship to epilepsy. In Encyclopedia of Epilepsy, P. Schwartzkroin Ed. Elsevier 2010.

LUBIN
F. Lubin 2010. Neurobiology of Learning and Memory Epigenetics addition. Requested by guest Editor Marcelo Wood. Invited review for Neurobiology of Learning and Memory

F. Lubin, R.R. Parrish, S. Gupta, N. Grissom, and R. Davis 2010. Epigenetic Mechanisms in Memory formation. Invited review for The Neuroscientist

S. Gupta, R. Parrish, and F. D. Lubin. 2009. Epigenetics and Translational Medicine. Translational Medicine: Applications in Psychiatry, Neurology and Neurodevelopmental Disorders; James Barrett, Joe Coyle and Mike Williams (Co-Editors), Cambridge University Press. Invited review in Press.

F. D. Lubin. 2009. 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
INVITED CHAPTERS IN EDITED BOOKS (Technical/Refereed):
Published:
Lee, W. Parpura, V. (2010) Carbon nanotubes as electrical interfaces with neurons. In: Ritsner, M.S. (Ed.) Brain Protection in Schizophrenia, Mood and Cognitive Disorders. Springer, Dordrecht, The Nederlands, pp 325-340.

Stout, R.F.Jr., **Parpura V.** (2010) Cell culturing of *C. elegans* glial cells for the assessment of cytosolic Ca^{2+} dynamics. Methods Mol Biol, In Press

COMMENTARIES
Published:
Liu W, Parpura V. (2009) Energetics of (dis)assembly of the ternary SNARE complex. Front. Neuroenergetics (2009) 1:5. doi: 10.3389/neuro.14.005.2009 [commentary]-peer reviewed

SONTHEIMER
Ernest, N.-J. and H. Sontheimer, Glioma, Encyclopedia of Neuroscience, 3rd Edition, Ed. Larry R. Squire Elsevier, Pages 877-884 (2009).

Sontheimer, H. Role of ion channels and amino-acid transporters in the biology of astrocytic tumors. In: Astrocytes in (patho)physiology of the nervous system (Parpura V, Haydon PG, eds),: Springer, p 527-546, (2009)

Lyons, S.A., and Sontheimer H. Peritumoral Epilepsy. Encyclopedia of Basic Epilepsy, Phil Schwartzkroin (ed.) Elsevier, 2009.

Sontheimer. H. Chloride transport in glioma growth and invasion. In: Physiology and Pathology of Chloride Transporters and Channels in the Nervous System, Alvarez, Elsevier, page2 515-525. (2009).

Weaver, A.K., and Sontheimer, H. The role of ion channels in the Etiology and Development of Gliomas. In: Structure, Function and Modulation of neuronal
voltage-gated ion channels. V.K. Gribkoff and L.K. Kaczmarek (eds.) Wiley, p.105-126 (2009)

4. Presentations at Scientific Meetings

BRENNER
Invited speaker on "Mapping injury response elements of the human GFAP promoter" for the 43rd Winter Conference on Brain Research, Breckenridge, CO, 24-29 January, 2010

Presentation on Alexander disease for the UAB Developmental Neurobiology group, 26 March 2010

Invited speaker at the Gordon Conference on Intermediate Filaments, Tilton, NH, 20-25 June 2010

Seminar presentation, Department of Cell Biology and Anatomy, University of North Texas Health Science Center, Fort Worth, TX, 2 December 2010.

Invited speaker at the "Conference on Glial Biology in Medicine," Birmingham, AL, December 6-7, 2010.

DOBRUNZ
4/21/10 UAB Department of Cell Biology Seminar. "Effects of postsynaptic neuron on presynaptic function at excitatory synapses in hippocampus."

5/10/10 University of Ruhr at Bochum, Bochum Germany. Symposium: Information processing via the temporoammonic pathway to the hippocampal CA1 region. "Developmental changes in short-term plasticity at Schaffer collateral vs. temporoammonic synapses in hippocampus."

HABLITZ
Invited Speaker, Symposium of Synaptic Plasticity, University of Oslo, Oslo, Norway, June 1-12, "Plasticity of GABAergic Synapses".

LESTER
Feb 2010 Society for Research on Nicotine and Tobacco (SNRT) – oral presentation

Feb 2010 SNRT – symposium discussant

LUBIN

2010 F. Lubin. Epigenetic Mechanisms in Memory formation. Annual meeting for the "Memory Disorders Research Society on genetics and memory functioning". Northwestern University, Chicago, IL. Invited by Dr. David Schnyer.

2010. F. Lubin. Histones on "Meth": Epigenetic Mechanisms in Memory formation. Michigan State University, Melbourne, MI. Invited by Dr. Sheba MohanKumar.

2010. F. Lubin. Epigenetic mechanisms in the brain: Implications in memory formation and cognitive disorders. Alabama State University, Montgomery, AL. Dr. Shiva Singh

OVERSTREET-WADICHE
Imaging Structure and Function in the Nervous System course, Cold Spring Harbor Laboratories, NY

Universite Paul Sabatier, Toulouse, France

American Epilepsy Society Neurogenesis in Epilepsy Workshop, Boston

PARPURA
2/4/10 "Carbon nanotubes as modulators of neuronal growth", The 2nd International Conference on Drug Discovery & Therapy, Dubai, UAE

3/1/10 "Carbon Carbon nanotubes affect neuronal growth and neurite outgrowth", 7th Annual Congress of the Global College of Neuroprotection (GCNN), Stockholm, Sweden

3/6/10 "Exocytosis in astrocytes: Emphasis on single vesicle/molecule measurements" in Pre-meeting workshop "Focus on imaging neuro-glial interactions in health and disease" (organizers Monica J. Carson and Emma H. Wilson, University of California, Riverside; and Vladimir Parpura, UAB), 41st Annual Meeting of the American Society for Neurochemistry, Santa Fe, NM.

3/10/10 "Exocytotic release of glutamate from astrocytes" in Colloquium entitled "Regulated exocytosis of neuroligands from astrocytes" (Organizer and chair: Vladimir Parpura), 41st Annual Meeting of the American Society for Neurochemistry, Santa Fe, NM.

3/16/10 "Neurobiology at the interface with nanotechnology: vignettes from the laboratory", Institute of Neuroscience, Newcastle University, Newcastle upon Tyne, UK.

3/18/10 "Tripartite synapse-astrocytic regulation of glutamate", Faculty of Life Sciences, University of Manchester, Manchester, UK.

3/19/10 "Neurobiology at the interface with nanotechnology: vignettes from the laboratory", Cancer Research UK London Research Institute, London, UK.

3/22/10 "Tripartite synapse: Mechanisms of glutamate release from astrocytes", Faculty of Science, University of Split, Split, Croatia.

3/23/10 "Tripartite synapse: Vesicular release of glutamate mediates bidirectional signaling between astrocytes and neurons", Faculty of Science, University of Split, Split, Croatia

3/24/10 "Tripartite synapse-astrocytic regulation of glutamate", Faculty of Medicine, University of Split, Split, Croatia.

4/9/10 "Neurobiology at the interface of neuroengineering and nanotechnology: Vignettes from the laboratory", Department of Biomedical Engineering, University of Alabama, Birmingham, AL

5/25/10 "Spatio-temporal characteristics of exocytosis in astrocytes", 4th International Society for Neurochemistry special neurochemistry conference on "Membrane domains in CNS physiology and pathology", Erice, Sicily, Italy

6/26/10 "Carbon as a material for neural interfaces", Computer assisted radiology and surgery (CARS) 2010 – 24th International Congress and Exhibition, Geneva, Switzerland

7/13/10 "Exocytosis in astrocytes: Emphasis on single vesicle/molecule measurements", School of Biological Sciences, Nanyang Technological University, Singapore

8/25/10 Exocytosis in astrocytes: Emphasis on single vesicle/molecule measurements", The Competence Center Molecular Medicine (KoMM), University of Saarland, Homburg-Sarr, Germany

8/28/10 "Exocytotic release of glutamate from astrocytes: Ca^{2+} sources and intracellular glutamate regulation", DFG-Priority Programme 1176-Final Symposium "The role of neuroglia for the formation, function and plasticity of synapses", Kaiserslautern, Germany

9/6/10 "Carbon nanotubes as modulators of neuronal growth", The Monte Verità Workshop on Frontiers in Neuroengineering, Ascona, Switzerland.

9/7/10 "Ca^{2+} sources and intracellular glutamate regulation for exocytotic glutamate release from astrocytes", 11th Symposium of the European Calcium Society on Calcium-Binding Proteins in Normal and Transformed Cells, Warsaw, Poland

10/12/10 "Carbon nanotubes as modulators of neuronal growth", World Congress of Neurotechnology, Rome, Italy

10/14/10 "Tripartite synapse-astrocytic regulation of glutamate", Dipartimento di Farmacologia, Università degli Studi di Firenze, Florence, Italy.

10/15/10 "Neurobiology at the interface of neuroengineering and nanotechnology: Vignettes from the laboratory", Department of Pharmaceutical Science, University of Modena and Reggio Emilia, Modena, Italy.

10/18/10 "Tripartite synapse-astrocytic regulation of glutamate", University of the Basque Country, Bilbao, Spain.

11/16/10 "Single Molecule Probing of SNARE Proteins by Force Spectroscopy In Symposium "Single Molecule Detection Techniques for Studying Exocytosis" (Organizer and chair: Vladimir Parpura), Society for Neuroscience 40th Annual Meeting, Neuroscience 2010, San Diego, CA

POZZO-MILLER
Centre for Development Neurobiology, King's College/MRC, London (June 2010).

Keynote Lecturer, Advanced Course on Confocal Microscopy, Instituto Ferreyra, Córdoba, Argentina (May 2010).

Invited Speaker, Neurodevelopment/Simpson-Ramsey Symposium, UAB, Birmingham AL (April 2010).

Institute Leloir, Universidad de Buenos Aires, Argentina (April 2010).

SONTHEIMER
University of Copenhagen, Dept Physiology. New treatments for primary brain tumors. Host Else Hoffmann (2/24/2010)

Second meeting on Ion Channels in Cancer, Florenze Italy, "Role of ClC-3 and TRPC1 channels in the malignant transformation of primary brain tumors" (3/2/-3/6/2010)

University of Washington, Seattle Dept. Pharmacology, "New treatments for primary brain tumors that target ion channels and amino acid transporters", Host Stella Nephi (5/18/2010)

VISSCHER
"Comparing EEG activity in younger and older adults during ignoring of irrelevant visual inputs," poster presented at the Evelyn F. And William L. McKnight Brain Institute Third Annual Inter-Institutional Meeting, April 30, 2010. Poster.

WADICHE
2010 Gordon Conference on Synaptic Transmission Short Data Talk

WILSON
University of Florida, Department of Genetics, Departmental Seminar, 2/2010

University of Alabama at Birmingham, Department of Neurobiology, 01/21/2010

Forum of European Neuroscience, Translational aspects of proteolysis in neurodegenerative diseases, Masstricht, Netherlands, 7/1/2010.

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

LUBIN
2010. F. Lubin. CHDI Foundation workshop on HDAC4 and Huntington's Disease (HD). Los Angeles, California.

2010. F. Lubin. 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.

2010. F. Lubin. Career options in research. University of Alabama at Birmingham, Birmingham, Alabama. Spoke to students in SPIN (Summer program in Neuroscience).

2010. F. Lubin. 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.

OVERSTREET-WADICHE
CNRS, Toulouse, France

THEIBERT
Undergraduate Neuroscience Recruitment

WADICHE
University of Texas Southwestern (Psychiatry)
NIH/NINDS invited speaker (Jeffrey Diamond and Annalissa Scimeni)

6. Awards

LESTER
2010 President's Award for Excellence in Teaching

LUBIN
2010 - 2011 McNulty Civitan Scientist Award

2010 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
2010 McNulty Scholar, Civitan International Research Center
For research on developmental disabilities

SONTHEIMER
Dean's Award for Excellence in Mentorship

WADICHE
2010 Stephanie Rudolph - Student Best poster presentation, Gordon Research Conference on Synaptic Transmission
2010 Ming-Chi Tsai selected to attend Okinawa Computational Neuroscience Course

WILSON
Promoted to associate professor

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

LUBIN

Carol Barnes-University of Arizona
Hendrik Luesch-University of Florida

POZZO-MILLER
Kristina Leuner, University of Frankfurt, Germany.
Gabriela Paglini, Instituto Ferreyra, Córdoba, Argentina.
Yong Li, Jiao-Tong University, Shanghai, China.
Takafumi Inoue, Waseda University, Tokyo, Japan.
Ed Chapman, University of Madison-Wisconsin.
Mu-ming Poo, University of California at Berkeley.
Lisa Monteggia, University of Texas-Southwestern.
Shinichi Kudo, Sapporo University, Japan.
Daniel Calvo, Universidad de Buenos Aires, Argentina

SONTHEIMER
UAB: Drs. Burt Nabors & Rotem Elgavish to conduct human clinical trial on low grade glioma patients who present with seizures. Submitted co-investigator RO1

University of Montana: Dr. Richard Bridges and Dr. Nicholas Natale. Development of a new generation of drugs to inhibit the system xc transporter to treat glioma. Submitted Co-investigator RO1.

THEIBERT
UAB McKnight-Collaboration with Dr. Lucas Pozzo-Miller
UAB McKnight-Collaboration with Dr. Lori McMahon

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

BRENNER
We are collaborating with Helen Kim, Steve Barnes, Jim Mobley and Cheryl Palmer on proteomic studies associated with Alexander disease, and with Alan Percy on an Alexander disease case study

Albee Messing, University of Wisconsin, Madison: Studies of GFAP transcription; screening compounds for the treatment of Alexander disease

Ursula Sonnewald, Norwegian University of Science and Technology, Trondheim, Norway: Metabolic studies of brain metabolism in Alexander disease model mice

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

Morgan Prust and Adeline Vanderver, Children's National Medical Center, Washington, DC: Analysis of forms of Alexander disease

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
New collaborations with Rita Cowell and Tim Gawne.

HABLITZ
Scott Baraban, UCSF, Alterations in transmitter release in Lis1 knockout mice.

LESTER

2010-present	Dr. Brady Yoda (UAB Cell Biology)
2006-present	Dr. Henry Lester (Caltech)
2010-present	Dr. Shannon Matta (University of Tennessee Memphis)

LUBIN
Xiaohua Li Lab
Mike Brenner Lab
Rita Cowell Lab
Lucus Pozzo-Miller Lab
Sue Spiller
Talene Yacoubian Lab
Standaert Lab
Michelle Olson
Erich Jarvis-Duke University
Nigel Jones-University of Melbourne, Australia
Robert Lipsky, INOVA
Christophe Bernard, INSERM, Marseille, France
Molly Meffert, John Hopkins

OVERSTREET-WADICHE
Rita Cowell, Psychiatry and Behavioral Neurobiology
Helen Kim, Pharmacology and Toxicology
Candace Floyd, Physical Med & Rehab
Mirjana Maletic-Savatic, Baylor College of Medicine

PARPURA
Carbon nanotubes (CNTs) in regeneration after spinal cord injury (C. Floyd)
ASIC1 plasma membrane expression in glioblastoma multiforme (D. Benos)
Immunophilins in exocytotic glutamate release from mouse (M. Lesort)
Carbon nanotubes as negative contrast agents (L. Paige)
The role of astrocytes in Huntington's disease (M. Gray)
Dimerization of rhodopsin: AFM (A. Gross)
The role of Connexin 43 and mGluR5 in astrocyte-neuron signalling (J.D. Sweatt and L. Pozzo-Miller)
BDNF trafficking in neurons (L. Pozzo-Miller)
Astrocytic model of Necrotising enterocolitis (R. Dimmit)
Unbiquitination in muscle development: C. elegans approach (S. Wilson)
Neuronal mRNA changes due to CNT exposure (E.N. Benveniste)

Neuronal, astrocytic and microglial mRNA changes due to CNT exposure (K. Mirnics, Vanderbilt Univ, TN)
CB1R and GPR55 trafficking in astrocytes (Andrew Irving, Univ of Dundee, UK)
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)
Software for Single Molecule Force Spectroscopy data analysis (D. Labudde, University of Applied Sciences Mittweida, Germany)
Mathematical modeling tools for neurobiology of brain injury and pharmacological treatment (A. Przekwas, CFD Research Corp, Huntsville, AL)
The role of Connexin 43 in astrocytic exocytosis (E. Scemes and D.C Spray, Albert Einstein College of Medicine, NY)
ER aggregates in C. elegans (G.C. Caldwell, Univ of Alabama, Tuscaloosa, AL)
Optogenetic approaches for stimulation of astrocyte in vivo (G. Ellis-Davies, Mount Sinai, NY)
CNTs for modulation of neuronal growth and myotube formation; FET interfaces for BMI (R.C. Haddon, Univ of California Riverside, CA
SNARE complex proteins (R. Jahn, MPI Gottingen, Germany; R. Zorec, Univ of Ljubljana, Slovenia)
VGLUTs trafficking in astrocytes (R. Zorec, Univ of Ljubljana, Slovenia; S. Duan, Chinese Academy of Sciences, China))
Munc13 in fusion pore (R. Zorec, Univ of Ljubljana, Slovenia; R. Burgoyne, Univ of Liverpool, UK)
SynCAM1 and Nell-2 in astrocytic calcium excitability (S.R. Ojeda, Oregon National Primate Research Center)
Single molecule measurements if SNARE protein interactions (U., Mohideen, Univ of California Riverside, CA)
Simulation of vesicular fusions in astrocytes (Herbert Levine, University of Sand Diego, CA)

SONTHEIMER
UAB: Drs. Burt Nabors & Rotem Elgavish to conduct human clinical trial on low grade glioma patients who present with seizures. Submitted co-investigator RO1

University of Montana: Dr. Richard Bridges and Dr. Nicholas Natale. Development of a new generation of drugs to inhibit the system xc transporter to treat glioma. Submitted Co-investigator RO1.

VISSCHER
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 two grants about this general topic. (One was a section of a PO1 proposal, the other was a CCTS pilot program proposal. Neither was funded.) Dr. Ross is also involved in training the Macular Degeneration patients for the studies described above and in the 'grants' section.

Cynthia Owsley and Dawn DeCarlo, Ophthalmology Department. Both Cynthia and Dawn 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 a great team for examining this question.

Ryan Walsh, Neurology Department. Dr. Walsh is an M.D. Ph.D. fellow whose work focuses on Parkinson's disease 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.

Associate Professor Jennifer Lister at University of Florida. She studies how the aging brain responds to auditory and visual stimuli. Our collaborative project investigates how cognitive training impacts auditory memory and the EEG responses to auditory stimuli in older adults. We are using the moving ripple stimulus design I have been working with for several years.

Assistant Professor Angela Gutchess at Brandeis University. I am a collaborator on a grant proposal to NIH 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.

WADICHE
Anastassios Tzingounis, Ph.D; University of Connecticut Storrs
Peter Jonas; Freiburg Institute for Advanced Studies

APPENDICES

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

Evelyn F. McKnight Seminars 2010		
01/14/2010	Craig Powell, M.D., Ph.D. University of Texas Southwestern Medical Center	*Animal Models of Autism: Molecular Mechanisms to Potential Therapies"*
01/28/2010	Kevin J. Staley, M.D. Professor Harvard Medical School Massachusetts Gen Hosp	*Neuronal ion transport, GABA-mediated synaptic signaling and seizure therapy*
02/04/2010	Steven E. Petersen, Ph.D. Professor of Cognitive Neuroscience Washington University St. Louis	*Network analysis of large-scale brain organization and development*
02/11/2010	Tallie Z. Baram, M.D., Ph.D Professor University of California, Irvine	*How does the brain become epileptic? plasticity, epigenetics, ion channels*
02/18/2010	Shannon G. Matta, Ph.D. Assoc. Professor University of Tennessee Health Science Center	*Neuronal mechanisms underlying transgenerational use of nicotine and alcohol*
02/25/2010	Bruce Bean, Ph.D. Professor Harvard Medical School Boston, Massachusetts	*Treating pain through TRP channels*
02/26/2010	Zhuan Zhou, Ph.D. Professor and Senior Investigator nstitute of Molecular Med. Peking University	*Modulation of neurotransmitter release by Action potential codes in striatum in vivo*
03/4/2010	Massimo Scanziani, Ph.D. Professor and Vice Chair University of California, San Diego	*Excitation and Inhibition in Cortical Space*
03/12/2010	Robert Zorec, Ph.D. Professor University of Ljubljana	*Exocytosis, Vesicle Discharge and Fusion Pore Regulation in Peptidergic Vesicles*
03/25/2010	Karen L. Gamble, Ph.D. Asst. Professor University of Alabama at Birmingham	*Alarm clocks and snooze buttons: Entrainment mechanisms of the mammalian circadian clock*
04/8/2010	Craig Garner, Ph.D. Professor Stanford School of Medicine	*Synaptic mechanisms underlying cognitive impairment in Down syndrome*
04/15/2010	Thomas Otis, Ph.D. Professor UCLA	*Novel optical approaches to probe single neuron signaling and circuit function in cerebellum*
05/06/2010	Jack Parent, M.D. Assoc. Professor University of Michigan Medical Center	*Stem Cells in Epilepsy Models and Stem Cell Models of Epilepsy*

05/13/2010	Jens R. Coorssen, Ph.D. Foundation Chair, Mole. Phy. SOM School of Biomedical & Health Sciences College of Health & Science University of Western Sydney NSW, Australia	*New approaches to dissecting the mechanism of Ca2+-Triggered Membrane Fusion*
05/20/2010	Jason Christie, Ph.D. Max Planck Florida Institute	*Calcium-dependent modulation of release by somatic depolarization*
05/27/2010	Edwin R. Chapman, Ph.D. Professor University of Wisconsin	*Synaptotagmins: roles in the nanomechanics of membrane fusion and in synaptic plasticity*
06/04/2010	Iria Mª González-Dopeso Reyes Visiting Scholar University of Santiago de Compostela, Spain	*Study of the expression and functional mechanisms of the extracellular matrix protein reelin, during prenatal development of the rat brain*
08/26/2010	Gwendalyn D. King, Ph.D. Faculty Candidate Boston University	*Understanding the aging brain: glioma therapeutics, neurodegeneration, and anti-aging genes*
09/2/2010	Osvaldo Uchitel, M.D., Ph.D. Director, Instituto de Fisiologia University of Buenos Aires, Argentina	*Calcium channels are a headache. Electrophysiological studies in a migraine animal model*
09/23/2010	Karoly Mirnics, M.D. Professor / Vice Chair Vanderbilt University	*GABA-ergic dysfunction in schizophrenia: from postmortem studies to animal models*
10/7/2010	Kamran Khodakhah, Ph.D. Professor Albert Einstein College of Medicine	*Neural Substrates of Rapic-Onset Dystonia Parkinsonism*
10/21/2010	Kerry Delaney, Ph.D. Professor/Chair University of Victoria	*Electrical compartmentalization in transmitter releasing dendrites of olfactory bulb neurons*
10/28/2010	Paul John Kenny, Ph.D. Asso. Professor The Scripps Research Institute - Florida	*Alpha5 Nicotinic Receptors in Nicotine Addiction*
11/4/2010	Serguei Skatchkov, Ph.D. Professor Universidad Central del Caribe Bayamón, PR	*Glia: A new way of signaling (photon transmission)*
11/11/2010	Mini Symposium Alexei Verkhratsky, M.D., Ph.D. University of Manchester, UK Candace Floyd, Ph.D. University of Alabama at Birmingham Michelle Gray, Ph.D. University of Alabama at Birmingham	*Physiology & pathophysiology of astroglia*

	Jose J. Rodrigues Arellano, Ph.D. Basque Foundation for Science & The University of the Basque Country, Spain	
12/02/2010	Dejan Zecevic, Ph.D. Research Scientist Yale University School of Medicine	*The century of the photon: probing dendrites, axons and synapses for electrical signals with light*

New Faculty Recruit Biosketches

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.

NAME Karlene Ball	POSITION TITLE University Professor
eRA COMMONS USER NAME BALLKK	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Indiana University	B.A.	May 1974	Psychology
Northwestern University	M.S.	Aug 1977	Psychology
Northwestern University	Ph.D.	June 1979	Psychology
Northwestern University	Postdoc	1979-1984	Psychology

A. Personal Statement

Dr. Karlene Ball is a University Professor and the Director of the UAB Center for Translational Research on Aging and Mobility (an Edward R. Roybal Center). In addition to these two roles, she serves as Associate Director, Center for Aging; Chair, Department of Psychology; Senior Scientist, Center for Outcomes and Effectiveness Research and Education, Vision Research Center; and Senior Scientist, Vision Science Research Center. Dr. Ball is recognized internationally as an expert in the field of vision, aging, and cognitive function and is particularly known for her work with older drivers. Dr. Ball currently serves on the Transportation Research Board of the National Research Council, and chairs the Committee for the Safe Mobility of Older Persons. She has been successful in translating basic research findings into practical applications, which are being evaluated in real-world settings, and her method for identifying at-risk drivers is currently being used in several states.

B. Positions and Honors

Employment

Aug. 1981 - Aug. 1984	Assistant Professor, Dept. Psychology, Trinity College
Aug. 1984 - Aug. 1986	Assistant Professor, Dept. Psychology, Western Kentucky University
Aug. 1986 - June 1990	Associate Professor, Dept. Psychology, Western Kentucky University
July, 1990 - May 1996	Professor, Dept. Psychology, Western Kentucky University
Sept., 1993	Director, Center for Research in Applied Gerontology
May, 1996	Professor, Dept. Psychology, Univ. of Alabama at Birmingham
Dec. 2008	Interim Chair, Dept. Psychology, Univ. of Alabama at Birmingham
February, 2009	University Professor, University of Alabama at Birmingham
February, 2010	Chair, Dept. of Psychology, Univ. of Alabama at Birmingham

Honors/National Offices

Phi Beta Kappa
Chair, Human Factors Technical Group on Aging, 1992-1993
M.E.R.I.T. award from the National Institute on Aging, 1994

Highway Safety Award, Nationwide Insurance, 1996
Fellow, American Psychological Association, 1997
Chair, Committee on Safe Mobility of Older Persons, 2006 – present, Transportation Research Board
Ireland Award for Scholarly Distinction, 2008

Current Federal Government Public Advisory Committees
Member, Transportation Research Board/National Research Council
Chair, Committee on the Safe Mobility for Older Persons, Transportation Research Board

C. Selected Peer-reviewed Publications (Selected from more than 150 peer-reviewed publications

1. **Ball K**, Owsley C, Stalvey B, Roenker DL, Sloan ME and Graves M. Driving avoidance and functional impairment in older drivers. *Accid Anal and Prev*; 30(3):313-322, 1998.
2. Owsley C, McGwin Jr G and **Ball K**. Vision impairment, eye disease, and injurious motor vehicle crashes in the elderly. *Ophthalmic Epidemiol*; 5(2):101-113, 1998.
3. **Ball K**, Berch DB, Helmers KF, Jobe JB, Leveck MD, Marsiske M, Morris JN, Rebok GW, Smith DM, Tennstedt SL, Unverzagt FW and Willis SL for the ACTIVE Study Group. Effects of Cognitive Training Interventions With Older Adults: A Randomized Controlled Trial. *JAMA*; 288(18):2271-2281, 2002.
4. **Ball K.** Real-world evaluation of visual function. *Ophthalmol Clin N Am*; 16(2):289-298, 2003.
5. **Ball K**, Wadley V and Roenker D. Obstacles to Implementing Research Outcomes in Community Settings. *Gerontologist*; 43:29-36, 2003.
6. Roenker DL, Cissell GM, **Ball K**, Wadley VG and Edwards JD. Speed-of-Processing and Driving Simulator Training Result in Improved Driving Performance. *Hum Factors*; 45(2):218-233, 2003.
7. Edwards JD, Wadley VG, Vance DE, Wood K, Roenker DL and **Ball K**. The impact of speed of processing training on cognitive and everyday performance. *Aging Ment Health*; 9(3):262-271, 2005.
8. Clay OJ, Wadley VG, Edwards JD, Roth DL, Roenker DL and **Ball K.** Cumulative Meta-analysis of the Relationship Between Useful Field of View and Driving Performance in Older Adults: Current and Future Implications. *Optom Vis Sci*; 82(8):724-731, 2005.
9. **Ball K**, Roenker DL, Wadley VG, Edwards JD, Roth DL, McGwin Jr G, Raleigh R, Joyce JJ, Cissell GM and Dube, T. Can High-Risk Older Drivers Be Identified Through Performance-Based Measures in a Department of Motor Vehicles Setting? *J Am Geriatr Soc*; 54(1):77-84,2006.
10. Willis SL, Tennstedt SL, Marsiske M, **Ball K**, Elias J, Koepke KM, Morris JN, Rebok GW, Unverzagt FW, Stoddard AM, Wright E, for the ACTIVE Study Group. Long-term Effects of Cognitive Training on Everyday Functional Outcomes in Older Adults. *JAMA*; 296(23):2805-2814,2006.
11. Wadley VG, Benz RL, **Ball K**, Roenker DL, Edwards JD and Vance DE. Development and Evaluation of Home-Based Speed-of-Processing Training for Older Adults. *Arch Phys Med Rehabil*; 87(6):757-763, 2006.
12. Viamonte SM, **Ball K** and Kilgore M. A Cost-Benefit Analysis of Risk-Reduction Strategies Targeted at Older Drivers. *Traffic Injury Prevention*; 7:352-359, 2006.
13. **Ball K**, Edwards JD, and Ross LA. The impact of speed of processing training on cognitive and everyday functions. J Gerontolology:Series B; 62B (1):19-31, 2007.
14. Ackerman ML, Edwards JD, Ross La, **Ball, K.** and Lunsman M. Examination of Cognitive and Instrumental Functional Performance as Indicators for Driving Cessation Risk Across 3 Years. *The Gerontologist*, 48 (6): 802-810, 2009. PMID19139253
15. Ross LA, Clay OJ, Edwards JE, **Ball K**, Wadley VG, Vance DE, Cissell GM, Roenker DL, and Joyce JJ. Do Older Drivers At-Risk for Crashes Modify Their Driving Over Time? *Journal of Gerontology B Psychol. Sci Soc Sci*; 64(2): 163-170, 2009. PMCID2655158

D. Research Activities

2 P30 AG022838-06 (Karlene Ball, PI), 09/1/2003 – 08/31/2014
NIH, "Center for Translational Research on Aging and Mobility"
The major goals of this project each to continue support for three cores, each designed to enhance the research infrastructure necessary to accomplish to objectives of the Center, and to support and promote translational research in the many affiliated Center research projects.

5 R01 AG05739-23 (K Ball, PI), 08/01/1985 - 07/31/2011
NIH, "Improvement of Visual Processing in Older Adults"
The major goal of this project is to determine the underlying reasons for visual/perceptual problems in older adults, as well as to understand the mechanisms for improved performance with training.

1 P30 AG031054-01 (R Allman, PI / K Ball, Investigator Development Core PI) 09/30/2007 – 06/30/2011
NIH, "Deep South Resource Center for Minority Aging Research"
This project will serve as research-based and mentoring investment in the process of closing the health disparities gap between African American and non-minority older adults, and increate the number of researchers with the capacity to conduct independent research related to minority aging and health disparities.

H133A070039-01 (T Novack, P.I.), 10/01/2002 – 09/30/2012
National Institute on Disability & Rehab Research
"UAB Traumatic Brain Injury Model System" (UAB TBIMS)
The purpose of this program is to maintain and improve the most cost effective, comprehensive service delivery system possible from the moment of injury across the life span for persons who incur a traumatic brain injury and to study the course of recovery and outcomes following the delivery of a coordinated system of care.

2 U01 AG014289-10 (K Ball, PI), 09/30/1996 – 04/30/2011
NIH, "ACTIVE Phase III: UAB Field Site"
The project extends follow-up of old and very-old persons who have received cognitive interventions as part of ACTIVE (Advanced Cognitive Training for Independent and Vital Elderly).

R01 AG030120-01 (Cynthia Owsley, PI), 04/01/2008 – 03/31/2013
NIH/NEI, "Older Drivers: An Evidence-Basis for Licensure Standards"
The purpose of this project is to create evidence based driver license standards as applied to the elderly.

5 R01 AG021958-05 (K Ball, PI), 02/15/10 – 01/31/15
NIA, "Predicting Long-Term Mobility Outcomes for Older Adults"
This project proposes to re-examine the original participants on a modified version of the screening battered administered five years later during their next license renewal cycle and to monitor, via telephone survey, the mobility of the entire sample over an additional three year period.

R01 AG030425-01A2 (Shelia Cotton, PI), 01/15/2009 – 12/31/2013
NIH, "Using ICT's To Enhance Quality of Life Among Older Adults, An Invention Study"
The purpose of this project is to use ICT's to enhance the quality of life among older adults.

Completed Research Support

5 T32 AG00274-03 (K Ball, PI), 05/01/06 - 12/31/07
NIA, "Clinical and Behavioral Training in Gerontology"

The major goal of this project is to provide training to four predoctoral and four postdoctoral fellows within the field of gerontology. Each trainee will work with a mentor in some aspect of the aging process.

2 U01 AG014289-06A1, 09/30/2003 –12/31/2007
NIH, "ACTIVE Phase II: UAB Field Site"
The major goal of this project is as a follow-up study focused on measuring the long-term impact of training effects on cognitive function and cognitively demanding everyday activities.

5 R03 AG23078-02 (Karlene Ball, PI), 09/01/04 – 06/30/2007
NIH, "Cognitive Training Gains and Mobility Outcomes in ACTIVE"
The goal for this project is to obtain state crash records of ACTIVE study participants and analyze the impact of prior cognitive training on crash risk.

2 P50 AG16582-09 (D. Marson, PI), 04/01/05 – 031/31/09
NIH, "Alzheimer's Disease Research Center"
The goal of this project is to examine everyday functions with direct ramifications for autonomy and safety (e.g., driving and financial skills) among individuals at risk for dementia and functional decline by virtue of their diagnosis of Mild Cognitive Impairment (MCI).

NAME	POSITION TITLE		
Tara M DeSilva, Ph.D.	Assistant Professor		
INSTITUTION AND LOCATION	DEGREE	YEAR	FIELD OF STUDY
Albright College	B.S.	1986-1990	Biochemistry
University of Pennsylvania	M.S.	1995-1997	Biological Chemistry
University of Pennsylvania	Ph.D.	1997-2000	Biological Chemistry
Children's Hospital & Harvard Med Sch	Post-doc	2001-2007	Neuroscience
Children's Hospital & Harvard Med Sch	Instructor	2007-2009	Neuroscience

Experience:

1987-1990 Teaching assistant, General Chemistry Laboratory, Albright College, Reading, PA.
1990-1995 Research specialist with Dr. David Speicher, The Wistar Institute, Philadelphia, PA.
1995-1996 Instructor, General Chemistry Laboratory, University of Pennsylvania, Philadelphia, PA
1996-2000 Graduate Research with Dr. Stanley Opella, Chemistry Dept., U. of Pennsylvania, Phila., PA
2001-2007 Postdoctoral Fellow with Dr. Paul Rosenberg and Joseph J Volpe, Children's Hospital and Harvard Medical School
2007-2009 Instructor of Neurology, Children's Hospital and Harvard Medical School
2009-present Assistant Professor, Physical Medicine and Rehabilitation, Department of Neurobiology, University of Alabama at Birmingham

Honors, Memberships in Professional Societies:

1987 – 1990 Beta, Beta, Beta Biological Honor Society, Albright College, Reading, PA
1995 – 1996 Teaching Assistant Award, Department of Chemistry, University of Pennsylvania
1999 Best Poster in NMR Award, Eastern Analytical Symposium, Somerset, NJ
2001 Cold Spring Harbor course in Developmental Neurobiology, NY
2002-present Society for Neuroscience
2003-present Cold Spring Harbor Laboratory Alumni Association
2007-present Ad-Hoc Reviewer, Journal of Neuroscience
2008 Neurobiology of Disease in Children, Young Investigator Award, Santa Clara,
2009 General Endowment Fund Scholar Award, University Alabama Health Services Foundation
2010-present McKnight Institute

Invited Seminars

The structure and function of heavy metal-binding proteins in humans and bacteria, University of California, San Diego, Department of Biology. 2002.

Transient expression of the glutamate transporter, EAAT2, in human cerebral white matter during development, Kroc symposium on myelin, University of Connecticut, 2003.

The Role of the Glutamate Transporter, GLT1, in the Pathogenesis of PVL, Department of Neurology, Children's Hospital Boston. 2005.

Regulated expression of EAAT2 in normative human cerebral white matter development and in PVL, Sixth Hershey Conference on Developmental Brain Injury, Paris, France. 2008.

The role of the glutamate transporter EAAT2 in the pathogenesis of cerebral palsy, Hospital of Infants, Geneva, Switzerland. 2008.

New strategies for neuroprotection in the newborn, Charite Universitatsmedizin, Berlin, Germany. 2008.

Functional NMDA receptors are present on developing and mature oligodendrocytes cultured from rat forebrain. Neurodevelopment meeting, Birmingham, AL. 2010.

Glutamatergic signaling during cerebral white matter development, Bevill Conference on Glial Biology in Medicine, Birmingham, AL. 2010

Funding Information

2002-2003 Investigator, NRSA, The development of glutamate transporters in human cerebral white matter, Sponsor: Dr. Michael Greenberg, Chair of Neurobiology.

2004-2005 P.I., William Randolph Hearst Foundation, The role of glutamate transporters in the pathogenesis of PVL.

2005-2007 P.I., United Cerebral Palsy Foundation, Regulation of glutamate transport in developing white matter by cytokines.

2006-2007 P.I., William Randolph Hearst Foundation, The role of PICK1 in excitotoxicity to developing oligodendrocytes.

2007-2010 Investigator, ELA Research Foundation, Is PICK1 involved in the pathogenesis of excitotoxic injury to oligodendrocytes in PVL?

2010-2012 P.I., General Endowment Fund Scholar Award, University of Alabama Health Services Foundation

Grants Pending

2011-2014 P.I., National Multiple Sclerosis Foundation, Glutamatergic signaling in demyelination and remyelination in multiple sclerosis.

2011-2012 P.I., Center for Clinical and Translational Science, New strategies for neuroprotection in the newborn.

Publications

DeSilva, T.M., Peng, K.C., Speicher, K.D., and Speicher, D.W. 1992. Analysis of human red cell spectrin tetramer (head-to-head) assembly using complementary univalent peptides. *Biochemistry*. 44:10872-10878.

Speicher, D.W., Weglarz, L., and DeSilva, T.M. 1992. Properties of human red cell spectrin heterodimer (side-to-side) assembly and identification of an essential nucleation site. *The Journal of Biological Chemistry*. 267:14775-14782.

Speicher, D.W., DeSilva, T.M., Speicher, K.D., Ursitti, J.A., Hembach, P., and Weglarz, L. 1993. Location of the human red cell spectrin tetramer binding site and detection of a related "closed" hairpin loop dimer using proteolytic footprinting. *The Journal of Biological Chemistry*. 25:4227-4235.

Kotula, L., DeSilva T.M., Speicher, D.W., and Curtis, P.J. 1993. Functional characterization of recombinant human red cell α-spectrin polypeptides containing the tetramer binding site. *The Journal of Biological Chemistry*. 268:14788-14793.

Ursitti, J.A., Kotula L., DeSilva, T.M., Curtis, P.J., and Speicher, D.W. 1996. Mapping the human erythrocyte β-spectrin dimer initiation site using recombinant peptides and correlation of its phasing with the α-actinin dimer site. *The Journal of Biological Chemistry*. 271:6636-6644.

DeSilva, T.M., Harper S.L., Kotula L., Hensley P., Curtis P.J., Otvos L., and Speicher, D.W. 1997. Physical properties of a single-motif erythrocyte spectrin peptide: a highly stable independently folding unit. *Biochemistry*. 36 (13):3991-3997.

Veglia, G., Porcelli, F., DeSilva, T.M., Prantner, A., and Opella, S.J. 2000. The three-dimensional structure of the metal binding motif GMTCAAC is the same in an 18-residue linear peptide and the mercury binding protein MerP. *Journal of the American Chemical Society.* 122 (10):2389-2390.

Mesleh, M.F., Veglia, G., DeSilva, T.M., Marassi, F.M., Opella, S.J. 2002 Dipolar waves as NMR maps of protein structure. *Journal of the American Chemical Society.* 124 (16): 4206-4207.

Opella, S.J., DeSilva, T.M., Veglia, G. 2002. Structural biology of metal-binding sequences. *Current Opinion in Chemical Biology.* 6 (2):217-223.

DeSilva, T.M., Veglia, G., Porcelli, F., Prantner, A., and Opella, S.J. 2002. Selectivity in heavy metal-binding to peptides and proteins. *Biopolymers.* 64 (4):189-197.

Buck, B., Zamoon, J., Kirby, T.L., DeSilva, T.M., Karim, C., Thomas, D., and Veglia G. 2003. Overexpression, purification, and characterization of recombinant Ca-ATPase regulators for high-resolution solution and solid-state NMR studies. *Protein Expression and Purification.* 30 (2):253-261.

Chen, W., Mahadomrongkul, V., Aoki, C., Berger, U.V., Bassan, M., DeSilva, T., Tanaka, K., Irwin, N., Rosenberg, P.A. 2003. The glutamate transporter GLT1a is expressed in neurons in the mature rat hippocampus, primarily in axon terminals, as well as in astrocytes. *Journal of Neuroscience.* 24 (5):1136-48.

Haynes, R.L., Borenstein N.S., DeSilva, T.M., Folkerth, R.D., Liu, L.G., Volpe, J.J., and Kinney, H.C. 2004. Axonal Development in the Cerebral White Matter of the Human Fetus and Infant. *Journal of Comparative Neurology.* 484 (2):156-67.

Berger, U.V., DeSilva, T.M., Chen, W., and Rosenberg, P.A. 2005 Cellular and subcellular mRNA localization of glutamate transporter isoforms GLT1a and GLT1b in rat brain by in situ hybridization. *Journal of Comparative Neurology.* 492 (1):78-89.

DeSilva, T.M., Veglia, G., and Opella, S. 2005 Solution structures of the reduced and Cu(I) bound forms of the first metal binding sequence of ATP7A associated with Menkes disease. *Proteins.* 61 (4):1038-49.

DeSilva, T.M., Kinney, H.C., Borenstein, N.S., Trachtenberg, F.L., Irwin, N., Volpe, J.J., and Rosenberg, P.A. 2007. The glutamate transporter, EAAT2, is transiently expressed in developing human cerebral white matter. *Journal of Comparative Neurology.* 501 (6):879-890.

DeSilva, T.M., Billiards, S., Borenstein, N.S., Trachtenberg, F.L., Volpe, J.J., Kinney, H.C., Rosenberg, P.A. 2008. Glutamate transporter EAAT2 expression is upregulated in reactive astrocytes in human periventricular leukomalacia. *Journal of Comparative Neurology.* 508 (2):238-248

Gerstner, B., DeSilva, T.M., Geriz, K., Armstrong, A.E., Brehmer, F., Neve, R.L., Felderhoff-Mueser, U., Volpe, J.J., and Rosenberg, P.A. 2008 Hyperoxia causes maturation-dependent cell death in the developing white matter. *Journal of Neuroscience.* 28 (5):1236-1245.

Bassam, M., Hongguang, Li., Madsen, K., Armsen, W., Zhou, J., DeSilva. T., Chen, W., Brasch, M., Paradise, A., Staudinger, J., Gether, U., Irwin, N., Rosenberg, P. 2008. Interaction between the glutamate transporter GLT1b and the synaptic PDZ domain protein PICK1. *European Journal of Neuroscience.* 27 (1):66-82.

Gerstner B., Lee, J., DeSilva, T.M., Jensen F.E., Volpe, J.J. and Rosenberg, P.A. 17β- estradiol protects against hypoxic/ischemic white matter damage in the neonatal rat brain. 2009. *Journal of Neuroscience Research.* 87 (9):2078-86.

DeSilva, T.M., Kabacov, A.Y., Goldhoff, P.E., Volpe, J.J., and Rosenberg, P.A. 2009 Regulation of glutamate transport in developing rat oligodendrocytes. 2009. *Journal of Neuroscience.* 29 (24):7898-908.

DeSilva, T.M. Borenstein, N.S., Volpe, J.J., Kinney, H.C., and Rosenberg, P.A. Expression of EAAT2 in neurons and protoplasmic astrocytes during human cortical development. *Journal of Comparative Neurology*. Under Revision.

DeSilva, T.M., Kabacov, A.Y., Logsdon, NJ., Volpe, J.J., and Rosenberg, P.A. Functional NMDA receptors are present on developing and mature oligodendrocytes cultured from rat forebrain. In preparation.

Book Chapters

DeSilva, T.M., Ursitti, J.A., and Speicher, D.W. 1994. Protein detection in gels using fixation. In: Current Protocols in Protein Science. J. Wiley & Sons, Inc., New York.

Ursitti, J.A., DeSilva T.M., and Speicher, D.W. 1994. Protein detection in gels without fixation. In: Current Protocols in Protein Science. J. Wiley & Sons, Inc., New York.

DeSilva, T.M. and Rosenberg, P.A. 2010 Oligodendrocyte glutamate receptors, transporters, and periventricular leukoencephalopathy. In: Biology of the Oligodendrocyte. Cambridge University Press.

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed

NAME **David S. Geldmacher, M.D.**	POSITION TITLE Professor of Neurology Director, Division of Behavioral Neurology and Memory Disorders
eRA COMMONS USER NAME	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
University of Rochester	B.A.	1978-82	Biology, Psychology
State Univ. of NY, Health Science Ctr at Syracuse	M.D.	1982-86	Medicine
Case Western Reserve University	-	1986-1990	Neurology (residency)
University of Florida	-	1990-91	Behav. Neurol (postdoc)

A. Positions and Honors

1986-87 Internship in Internal Medicine, Mt. Sinai Medical Center, Cleveland, Ohio
1987-90 Residency in Neurology, Case Western Reserve University, Cleveland, Ohio
1990-91 Post-Doctoral Fellowship in Behavioral Neurology, Center for Neuropsychological Studies, University of Florida, Gainesville, Florida
1991-92 Assistant Professor, Department of Neurology, Robert Wood Johnson Medical School, The University of Medicine and Dentistry of New Jersey, New Brunswick, NJ
1993-2001 Assistant & Associate Professor, Alzheimer Center, Department of Neurology, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio
1994-2002 Clinical Director and Director for Clinical Trials, Alzheimer Center, University Hospitals of Cleveland and Case Western Reserve University
2002-2011 Associate Professor and Director, Memory Disorders Program, Department of Neurology, University of Virginia, Charlottesville, Virginia
2006-2011 Harrison Distinguished Teaching Associate Professor of Neurology, University of Virginia
2011(expected) Collat Professor of Neurology, and Director, Division of Behavioral Neurology and Memory Disorders, Department of Neurology, University of Alabama-Birmingham, Birmingham, Alabama

B. Selected peer-reviewed publications (in chronological order)

Original Research Articles (from 29 original research articles)

GELDMACHER DS, Doty L, Heilman K. Spatial performance bias in normal elderly subjects on a letter cancellation task. *Neuropsychiatry, Neuropsychology, and Behavioral Neurology,* 1994;7(4):275-280.

Geldmacher DS, Heilman KM. Visual field influence on human attentional biases. *Brain and Cognition,* 1994; 26:65-72.

Geldmacher DS, Doty L, Heilman KM. Letter cancellation performance in Alzheimer's disease. *Neuropsychiatry, Neuropsychology, and Behavioral Neurology* 1995; 8:259-263.

Geldmacher DS. Effects of stimulus and target-to-distractor ratio on the performance of random array letter cancellations tasks. *Brain and Cognition* 1996; 32:405-415.

Geldmacher DS, Hills EC. Effect of stimulus number, target-to-distractor ratio and motor speed on visuospatial search quality following traumatic brain injury. *Brain Injury* 1997; 11(1):59-66

Hills EC, **Geldmacher DS**. The effect of character and array type on visual spatial search quality following traumatic brain injury. *Brain Injury* 1998; 12:69-76.

Geldmacher DS. Stimulus characteristic determine processing approach on random array letter cancellation tasks. *Brain and Cognition* 1998; 36:346-354.

Esteban-Santillan CG, Praditsuwan R, Ueda H, **Geldmacher DS**. Clock drawing test in very mild Alzheimer's disease. *J. Am Geriatrics Society* 1998;46:1266-1269.

Geldmacher DS, Riedel T. Age effects on the spatial location of errors on Random-Array Letter Cancellation Tests. *Neuropsychiatry, Neuropsychology, and Behavioral Neurology* 1999;12:28-34.

Geldmacher DS, Fritsch T, Riedel TM. Effects of stimulus properties and age on random array letter cancellation tasks. *Aging Neuropsychology and Cognition* 2000;7:194-204

Wu Q, Combs C, Cannady SB, **Geldmacher DS**, Herrup K. Beta-amyloid activated microglia induce cell cycling and cell death in cultured cortical neurons. *Neurobiology of Aging* 2000;21:797-806.

Doody R, **Geldmacher DS,** Gordon B, Perdomo CA, Pratt, RD for the Donepezil Study Group. Open-label, multicenter, phase 3 extension study of the safety and efficacy of Donepezil in patients with Alzheimer Disease. *Archives of Neurology* 2001;58(3):427-433.

Yang Y, **Geldmacher DS,** Herrup K. DNA replication precedes neuronal death in Alzheimer's disease. *Journal of Neuroscience* 2001;21(8):2661-2668.

Smyth KA, Neundorfer MM, Koss E, **Geldmacher DS**, Ogrocki P, Whitehouse PJ. Quality of life and deficit identification in dementia. *Dementia: The International Journal of Social Research and Practice* 2002;I:345-58

Mizrahi EH, Fritsch TF, **Geldmacher DS**, Soas AH, Friedland RP. Lerner AJ. Medication use in Alzheimer's disease and healthy aging: Results from a research registry. *Clinical Gerontologist* 2002;24:75-84

Fillit H, **Geldmacher DS,** Welter RT, Maslow K, Fraser M. Recognition and management of Alzheimer's disease: diagnostic, coding and reimbursement barriers to optimum management. *Journal of the American Geriatrics Society* 2002:1871-1878.

Santillan CE, Fritsch T, **Geldmacher DS.** Development of a scale to predict decline among mildly demented Alzheimer's disease patients *Journal of the American Geriatrics Society* 2003;51:91-95

Geldmacher DS, Provenzano G, McRae T, Mastey V, Ieni JR. Donepezil is associated with delayed nursing home placement in patients with Alzheimer's disease. *Journal of the American Geriatrics Society* 2003;51:937-944.

Black SE, Roman G, **Geldmacher DS**, Salloway S, Hecker J, Burns A, Perdomo C, Kumar D, Pratt RD' Efficacy and tolerability of donepezil in vascular dementia: Positive results of a 24-week, multicenter, international, randomized, placebo-controlled clinical trial. *Stroke* 2003: 34:2323-30.

Quigg M, **Geldmacher DS**. Elias WJ. Conduction aphasia as a function of the dominant posterior perisylvian cortex. Report of two cases. *Journal of Neurosurgery* 2006:104;845-8

Geldmacher DS, Fritsch T, McClendon MJ, Landreth GE. A randomized pilot clinical trial of the safety of pioglitazone in treatment of patients with Alzheimer disease. *Arch Neurol.* Published online September 13, 2010. doi:10.1001/archneurol.2010.229

Book Authorship

Geldmacher DS. Contemporary diagnosis and management of Alzheimer's disease. First edition 2001: Newtown, Pennsylvania: Handbooks in Health Care, Co. (ISBN# 1-884065-39-2).

Geldmacher DS. Contemporary diagnosis and management of Alzheimer's dementia. First edition 2003: Newtown, Pennsylvania: Handbooks in Health Care, Co. (ISBN# 1-931981-16-7).

Book Chapters & Reviews (from 60 chapters and reviews)

Geldmacher DS, Whitehouse PJ. Evaluation of dementia. *New England Journal of Medicine* 1996, 335:330-336.

Landes A, Sperry SD, Strauss ME, **Geldmacher DS.** Apathy in Alzheimer's Disease. *J Am Geriatrics Soc* 2001;49:1700-1707.

Geldmacher DS. Cost-effective diagnosis and management of Alzheimer's disease. *Seminars in Neurology* 2002;22:63-70

Geldmacher DS. Visuospatial dysfunction in the neurodegenerative diseases. *Frontiers in Bioscience* 2003;8:e428-436.

Geldmacher DS. Donepezil (Aricept) for treatment of Alzheimer's disease and other dementing conditions. Expert Rev. Neurotherapeutics 2004;4:5-16

Geldmacher DS. Differential diagnosis of dementia syndromes. *Clinics in Geriatric Medicine of North America* 2004;20:27-44.

Crooks EA, **Geldmacher DS.** Interdisciplinary approaches to Alzheimer's disease management. *Clinics in Geriatric Medicine of North America* 2004;20:121-140.

Geldmacher DS. Dementia with Lewy bodies: Diagnosis and clinical approach. *Cleveland Clinic Journal of Medicine* 2004:71:789-800

Geldmacher DS. The cost benefit to managed care plans associated with pharmacotherapy of Alzheimer's disease. *Managed Care* 2005;14(12):44-55

Geldmacher DS, Frolich L, Doody R, Erkinjuntti T, Vellas B, Jones R, Banerjee S, Lin P, Sano M. Realistic Expectations for Treatment Success in Alzheimer's Disease.*Journal of Nutrition Health and Aging;* 2006;10:417-29

Geldmacher DS. Treatment Guidelines for Alzheimer's Disease: Redefining Perceptions in Primary Care. *Primary Care Companion-Journal of Clinical Psychiatry* 2007;9:113-21

Geldmacher DS. Acetylcholinesterase Inhibitors for Alzheimer's Disease. Aging Health 2007 2007;3:483-94.

Geldmacher DS. Cost effectiveness of Drug Therapies for Alzheimer's Disease: A brief review. *Neuropsychiatric Disease and Treatment 2008*;4:549-55

Geldmacher DS. Alzheimer disease prevention: Focus on cardiovascular risk, not amyloid? Cleveland Clinic Journal of Medicine 2010;77:689-704 10.3949/ccjm.77gr.2010

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed

NAME Gray, Michelle	POSITION TITLE Instructor
eRA COMMONS USER NAME (credential, e.g., agency login)	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Alabama State University, Montgomery, AL	B.S.	1993-1997	Biology
Ohio State University, Columbus, OH	Ph.D.	1997-2003	Molecular, Cellular and Developmental Biology
University of California, Los Angeles, Los Angeles, CA	Post doc	2003-2008	Postdoctoral training/mouse genetics

Positions

2010 Assistant Professor, Department of Neurology, Center for Neurodegeneration and Experimental Therapeutics, University of Alabama at Birmingham
2010 Secondary Appointment, Department of Neurobiology, University of Alabama at Birmingham
2010 Assistant Scientist, Center for Glial Biology in Medicine
2008-2010 Instructor, Department of Neurology, Center for Neurodegeneration and Experimental Therapeutics, University of Alabama at Birmingham
2003-2008 Postdoctoral fellow, Semel Institute for Neuroscience and Human Behavior, David Geffen School of Medicine, University of California, Los Angeles
1998-2003 Graduate Research Associate, Molecular, Cellular and Developmental Biology Program, The Ohio State University
1998 Graduate Teaching Assistant, Human Biology
1997-1998 Graduate Teaching Assistant, Introduction to Biology, Introductory Biology Program , The Ohio State University

Fellowships and Awards

2010 National Institutes of Health, K01 Career Development Award
2008 Travel Award/Best Poster, CHDI Inc., 3rd Annual HD Therapeutics Conference: A Forum for Drug Discovery & Development
2006 Gordon Research Conferences Travel Award, CAG Triplet Repeat Disorders
2005-2006 National Institutes of Health, Post-doctoral fellowship, Neurobehavioral Genetics, University of California, Los Angeles
2003-2005 National Institutes of Health, Post-doctoral fellowship Mental Retardation Research Center, University of California, Los Angeles
2000-2003 National Institutes of Health, Ruth L. Kirschstein National Research Service Award, predoctoral fellowship, The Ohio State University
1996-1997 National Institutes of Health, Minority Access to Research Careers Honors Fellow, Alabama State University

1995-1996 National Institutes of Health, Minority Biomedical Research Support Fellow, Alabama State University

Publications

X. William Yang and Michelle Gray. Mouse models of Huntington's Disease for validating preclinical candidates. In "New Therapeutic Development in Huntington's Disease" (Edited by Don Lo and Robert Hughes). CRC Press. Boca Raton, Florida (2010).

Michelle Gray, Dyna I. Shirasaki, Carlos Cepeda, Veronique M. Andre, Brian Wilburn, Xiao-Hong Lu, Jifang Tao, Irene Yamazaki, Shi-Hua Li, Yi E. Sun, Xiao-Jiang Li, Michael S. Levine, X. William Yang. Full Length Human Mutant Huntingtin with a Stable Polyglutamine Repeat Can Elicit Progressive and Selective Neuropathogenesis in BACHD Mice. Journal of Neuroscience, 2008 Jun 11;28(24):6182-95.

Mary Kay Lobo, Stanislav L. Karsten, Michelle Gray, Daniel H. Geschwind and X. William Yang. FACS-array profiling of striatal projection neuron subtypes in juvenile and adult mouse brains. Nature Neuroscience, 2006, Mar;9(3):443-52.

Katherine S. Liu, Michelle Gray, Stephanie Otto, Joseph R. Fetcho, and Christine E. Beattie. Zebrafish *deadly seven* reveals developmental plasticity in the escape response circuit. Journal of Neuroscience, 2003, Sep 3;23(22):8159-66.

Michelle Gray, Cecilia B.Moens, Sharon L. Amacher, Judith S. Eisen and Christine E. Beattie. Zebrafish *deadly seven* functions in neurogenesis. Developmental Biology, 2001 Sep 15;237(2):306-23.

Research Support

2010-2011
Hereditary Disease Foundation
Conditional Inactivation of full-length mutant huntingtin expression in glial cells of BACHD mice
Role: Principal Investigator

2010-2015
National Institutes of Health, NINDS, K01 Career Development Award
The Role of Astrocytes in Huntington's Disease
Role: Principal Investigator

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2

NAME King, Gwendalyn D.	POSITION TITLE Instructor
eRA COMMONS USER NAME (credential, e.g., agency login)	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Purdue University	B.S.	1999	Molecular Biology
University of Michigan	M.S./Ph.D.	2002/2004	Neuroscience
Cedars-Sinai Medical Center/UCLA	Postdoctoral	204-2007	Neuro-immunology
Boston University School of Medicine	Postdoctoral	2008-	Neuroscience

A. Positions and Honors

Employment:

5/1999-8/1999 Purdue University, Biology Department, Dr. Chris Sahley, summer research student employee.

9/1999-12/2003 University of Michigan, Neuroscience Graduate Program, Dr. R.Scott Turner, graduate student.

1/2004-12/2007 Cedars-Sinai Medical Center, Gene Therapeutics Research Institute, Dr. Maria Castro, postdoctoral fellow.

1/2008-present Boston University School of Medicine, Department of Biochemistry, Dr. Carmela Abraham, postdoctoral fellow.

Honors:

2007 Malaniak Award for Excellence in Postdoctoral Research

2005-2007 National Research Service Award – postdoctoral – NIH/NINDS (F32 NS0503034-01) "Glioma regression using gutless adenoviral vectors.

2002-2004 National Research Service Award – predoctoral – NIH/NINDS (1F31NS43078-01) "Effects of X11α:Amyloid Precursor Protein Interaction"

2002 Rackham International Travel GrantTravel Award, 8th International Conference on Alzheimer's Disease and Related Disorders Travel Award; Stockholm, Sweden 200

2001-2004: Annual Rackham Travel Grant

Professional Societies:

Society for Neuroscience, American Association for Cancer Research. American Association for Gene Therapy, Society for Neuro-oncology

B. Peer Reviewed Publications

Original Research **(* indicates joint first authorship designated)**

King GD, Muhammad AKM, Xiong W, Kroeger KM, Puntel M, Larocque D, Palmer D, Ng P, Lowenstein PR, Castro MG. High-capacity adenoviral vector-mediated anti-glioma gene therapy in the presence of systemic anti-adenovirus immunity. Journal of Virology (2008) 82(9):4680-4. PMID: 18287240

King GD, , Kroeger KM, Bresee CJ, Candolfi M, Liu C, Manalo CM, Muhammad AKM, Pechnick RN, Lowenstein PR, Castro MG. Flt3L in combination with HSV1-TK- mediated gene therapy reverses brain tumor-induced behavioral deficits. Molecular Therapy (2008) 16(4):682-90. PMID: 18283279

King GD, Muhammad AKM, CurtinJF, Barcia C, Puntel M, Liu C, Candolfi M, Honig SB, Mondkar S, Lowenstein PR, Castro MG. Flt3L and HSV1-TK eradicate multifocal glioma in a syngeneic glioblastoma model. *Neuro-oncology*; (2008) 10(1):19-31. PMID: 18079358

Barcia C, Jimenez-Dalmaroni M, Kroeger KM, Puntel M, Rappaport A, Larocque D, **King GD**, Johnson SA, Liu C, Xiong W, Candolfi M, Mondkar S, Ng P, Palmer D, Castro MG, Lowenstein PR. One-year expression from high-capacity adenoviral vectors in he brains of animals with pre-existing anti-adenoviral immunity: clinical implications. *Molecular Therapy*; (2007) 15(12):2154-63. PMID: 17895861

Candolfi M, Curtin JF, Nichols WS, Muhammad AG, **King GD**, Pluhar GE, McNeil EA, Ohlfest JR, Freese AB, Moore PF, Lerner J, Lowenstein PR, Castro MG. Intracranial glioblastoma models in preclinical neuro-oncology: neuropathological characterization and tumor progression. Journal of Neurooncology (2007) 85(2):133-48. PMID: 17874037

Barcia C, Thomas CE, Curtin JF, **King GD**, Wawrowsky, K, Candolfi M, Xiong W, Liu C, Kroeger KM, Boyer O, Kupiec-Weglinski J, Klatzmann D, Castro MG, and Lowenstein PR. In vivo mature immunological synapses forming SMACs mediate clearance of virally infected astrocytes from the brain. *Journal of Experimental Medicine*; (2006) 203: 2095-107. PMID: 16923851

Curtin JF, **King GD**, Barcia C, Liu C, Hubert FX, Guillonneau C, Josien R, Anegon I, Lowenstein PR, Castro MG. Flt3 ligand recruits plasmacytoid dendritic cells to the brain. *Journal of Immunology* (2006) 176: 3566 – 3577. PMID: 16517725

Xiong W., Goverdhana S., Sciascia S.A., Candolfi M., Zirger J.M., Barcia C., Curtin J.F., **King G.D.**, Jaita G., Liu C., Kroeger K., Ng P., Palmer D., Agadjanian H., Medina-Kauwe L., Lowenstein P.R., and Castro M.G. Regulatable Gutless Adenovirus Vectors are Capable of Regulating Transgene Expression in the Brain in the Presence of an Immune Response Against Adenoviruses. *Journal of Virology* (2006) 80: 27-37. PMID: 16352528

Ali S*, **King GD***, Curtin JF, , Xiong W, Puntel M, Liu C, Cheng Q, Prieto J, Lassmann H, Lowenstein PR, Castro MG. Combined immune-stimulation and conditional cytotoxic gene therapy provide long-term survival in a macroscopic glioma model. *Cancer Research*, (2005) 65 (16) :7194-204. PMID: 16103070 4.20

Ali S, Curtin JF, Zirger JM, Xiong W, **King GD**, Barcia C, Liu C, Puntel M, Goverdhana S, Lowenstein PR, Castro MG. Inflammatory and anti-glioma effects of an adenovirus expressing human soluble fms-

B. Peer Reviewed Publications

Original Research **(* indicates joint first authorship designated)**

King GD, Muhammad AKM, Xiong W, Kroeger KM, Puntel M, Larocque D, Palmer D, Ng P, Lowenstein PR, Castro MG. High-capacity adenoviral vector-mediated anti-glioma gene therapy in the presence of systemic anti-adenovirus immunity. Journal of Virology (2008) 82(9):4680-4. PMID: 18287240

King GD, , Kroeger KM, Bresee CJ, Candolfi M, Liu C, Manalo CM, Muhammad AKM, Pechnick RN, Lowenstein PR, Castro MG. Flt3L in combination with HSV1-TK- mediated gene therapy reverses brain tumor-induced behavioral deficits. Molecular Therapy (2008) 16(4):682-90. PMID: 18283279

King GD, Muhammad AKM, CurtinJF, Barcia C, Puntel M, Liu C, Candolfi M, Honig SB, Mondkar S, Lowenstein PR, Castro MG. Flt3L and HSV1-TK eradicate multifocal glioma in a syngeneic glioblastoma model. *Neuro-oncology*; (2008) 10(1):19-31. PMID: 18079358

Barcia C, Jimenez-Dalmaroni M, Kroeger KM, Puntel M, Rappaport A, Larocque D, **King GD**, Johnson SA, Liu C, Xiong W, Candolfi M, Mondkar S, Ng P, Palmer D, Castro MG, Lowenstein PR. One-year expression from high-capacity adenoviral vectors in he brains of animals with pre-existing anti-adenoviral immunity: clinical implications. *Molecular Therapy*; (2007) 15(12):2154-63. PMID: 17895861

Candolfi M, Curtin JF, Nichols WS, Muhammad AG, **King GD**, Pluhar GE, McNeil EA, Ohlfest JR, Freese AB, Moore PF, Lerner J, Lowenstein PR, Castro MG. Intracranial glioblastoma models in preclinical neuro-oncology: neuropathological characterization and tumor progression. Journal of Neurooncology (2007) 85(2):133-48. PMID: 17874037

Barcia C, Thomas CE, Curtin JF, **King GD**, Wawrowsky, K, Candolfi M, Xiong W, Liu C, Kroeger KM, Boyer O, Kupiec-Weglinski J, Klatzmann D, Castro MG, and Lowenstein PR. In vivo mature immunological synapses forming SMACs mediate clearance of virally infected astrocytes from the brain. *Journal of Experimental Medicine*; (2006) 203: 2095-107. PMID: 16923851

Curtin JF, **King GD**, Barcia C, Liu C, Hubert FX, Guillonneau C, Josien R, Anegon I, Lowenstein PR, Castro MG. Flt3 ligand recruits plasmacytoid dendritic cells to the brain. *Journal of Immunology* (2006) 176: 3566 – 3577. PMID: 16517725

Xiong W., Goverdhana S., Sciascia S.A., Candolfi M., Zirger J.M., Barcia C., Curtin J.F., **King G.D.**, Jaita G., Liu C., Kroeger K., Ng P., Palmer D., Agadjanian H., Medina-Kauwe L., Lowenstein P.R., and Castro M.G. Regulatable Gutless Adenovirus Vectors are Capable of Regulating Transgene Expression in the Brain in the Presence of an Immune Response Against Adenoviruses. *Journal of Virology* (2006) 80: 27-37. PMID: 16352528

Ali S*, **King GD***, Curtin JF, , Xiong W, Puntel M, Liu C, Cheng Q, Prieto J, Lassmann H, Lowenstein PR, Castro MG. Combined immune-stimulation and conditional cytotoxic gene therapy provide long-term survival in a macroscopic glioma model. *Cancer Research*, (2005) 65 (16) :7194-204. PMID: 16103070

Ali S, Curtin JF, Zirger JM, Xiong W, **King GD**, Barcia C, Liu C, Puntel M, Goverdhana S, Lowenstein PR, Castro MG. Inflammatory and anti-glioma effects of an adenovirus expressing human soluble fms-

like tyrosine kinase 3 ligand (hsFlt3L): treatment with hsFlt3L inhibits intracranial glioma progression. *Molecular Therapy*, (2004) 10 (6):1071-84. PMID: 15564139

King GD, Perez RG, Steinhilb ML, Gaut JR, Turner RS. X11α modulates secretory and endocytic metabolism of the Amyloid Precursor Protein. *Neuroscience*. (2003)120, 143-154. PMID: 12849748

King GD, Cherian K, Turner RS. X11α impairs γ- but not β-secretase cleavage of Amyloid Precursor Protein. *Journal of Neurochemistry*, (2005) 88 (4):971-82. PMID: 14756819

Reviews **(* indicates joint first authorship designated)**
King GD*, Curtin JF*, Candolfi M, Kroeger K, Lowenstein PR, Castro MG. Gene Therapy and Targeted Toxins for Glioma. *Current Gene Therapy* (2005) 5:535-557. PMID: 16457645

Curtin JF*, **King GD***, Candolfi M, Greeno RB, Kroeger KM, Lowenstein PR, Castro MG. Combining cytotoxic and immune-mediated gene therapy to treat brain tumors. *Current Topics in Medicinal Chemistry* (2005) 5(12):1151-70. PMID: 16248789

Goverdhana S, Puntel M, Xiong W, Zirger JM, Barcia C, Curtin JF, Soffer EB, Mondkar S, **King GD**, Hu J, Sciascia SA, Candolfi M, Greengold DS, Lowenstein PR, Castro MG. Regulatable gene expression systems for gene therapy applications: progress and future challenges. *Molecular Therapy*. (2005) 12(2):189-211. PMID: 15946903

King GD, Turner RS. Adaptor protein interactions: modulators of Amyloid Precursor Protein metabolism and Alzheimer's disease risk? *Experimental Neurology*. (2004)185: 208-19. PMID: 14736502

C. Research Support

1K99AG034989-01
NIH/NIA, King (PI), 9/30/09- present
Klotho regulation and aging
Role: Primary Investigator
Harvard NeuroDiscovery Center Abraham (PI) 7/2008-6/2009
Research Fellowship in Drug Development.
Role:co-investigator

F32 NS0503034-01, King (PI), 7/05-12/07
NIH/NINDS, National Research Service Award – Postdoctoral - "Glioma regression using gutless adenoviral vectors,

1F31NS43078-01, King (PI), 6/02- 5/05
NIH/NINDS
National Research Service Award – Predoctoral – "Effects of X11α:Amyloid Precursor Protein Interaction"

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed

NAME Michelle L. Olsen, Ph.D.	POSITION TITLE Assistant Professor
eRA COMMONS USER NAME (credential, e.g., agency login)	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Southern Oregon University	B.S.	06/1999	Chemistry
University of Alabama at Birmingham	Ph.D.	05/2005	Neurobiology
University of Alabama at Birmingham	Postdoctoral	2010	Neurobiology

A. Personal Statement

The focus of my research is to enhance our understanding of the role of astrocytes in brain function. During my training my research focused primarily on astrocyte mediated ion and glutamate homeostasis in normal and pathophysiological spinal cord and brain. During this work I made the discovery that Kir4.1, an inwardly rectifying potassium channel mediates the negative resting membrane potential, high potassium permeability and is the primary conductance in spinal cord astrocytes. I also discovered this channel is robustly upregulated during early postnatal development and mediates K^+ clearance in the spinal cord. This work contributed significantly to establishing the importance of Kir4.1 in brain function. As a result of these findings, I have prepared the current proposal that builds logically on my prior work while carving my own unique niche in the neuroscience field. This proposal focuses on the loss of Kir4.1 and the excitatory glutamate transporter, GLT-1 following pediatric brain injury. The overarching hypothesis of this proposal posits that DNA methylation serves to repress transcription of these two genes following traumatic brain injury. These changes may underlie abnormal brain development commonly observed following injury to pediatric patients. The proposed research is within my expertise. I have an excellent record of innovative work and specific training in molecular, biochemical and biophysical assays needed to perform the proposed experiments. I have also secured a group of four collaborators/consultants on this project with expertise in the fields of epigenetics, traumatic injury and neuronal biophysics which will provide general guidance in each field as well as assist in the implementation and interpretations of my proposed experiments.

B. Research and/or Professional Experience

Positions

2005 - 2010 Post-doctoral Fellow, Laboratory of Dr. Harald Sontheimer Department of Neurobiology, University of Alabama at Birmingham

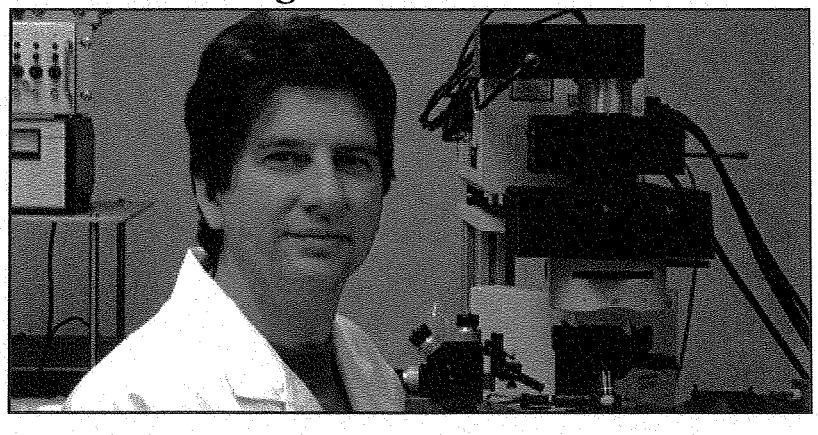
2010 - present Assistant Professor, Department of Physiology and Biophysics University of Alabama at Birmingham, Birmingham, AL

2010 - present Assistant Professor, Department of Neurobiology University of Alabama at Birmingham, Birmingham, AL

2010 - present Associate Scientist, Civitan International Research Center University of Alabama at Birmingham, Birmingham, AL

ARTICLES

$10 Million Endowment Established for UAB's McKnight Brain Institute



BIRMINGHAM, Ala. - The University of Alabama at Birmingham (UAB) and the McKnight Brain Research Foundation, of Orlando, Fla., are establishing a $10 million endowment for the Evelyn F. McKnight Brain Institute at UAB to support the institute and the Evelyn F. McKnight Endowed Chair for Learning and Memory in Aging. The endowment is made possible by a $5 million gift from the McKnight Brain Research Foundation and a $5 million matching contribution from UAB and other donors.

"This generous gift from the McKnight Foundation will enable the institute and the endowed chair to exist in perpetuity at UAB," said Robert Rich, M.D., senior vice president and dean of the UAB School of Medicine. "We are incredibly indebted to the trustees of the foundation for their investment in UAB's research to better understand age-related memory loss."

The institute was established at UAB with an initial $5 million gift from the McKnight Brain Research Foundation in 2004, followed by an additional $1 million in November 2005. The total amount of the new gift is $6 million, including $5 million for the endowment and an additional $1 million for operational funding, also to be matched by UAB.

David Sweatt, Ph.D., the chair of UAB's Department of Neurobiology, is the director of the institute and holder of the Evelyn F. McKnight Endowed Chair. The institute occupies 75,000 square feet of research space on three floors of the Richard C. and Annette N. Shelby Interdisciplinary Biomedical Research Building.

Sweatt's research focuses on molecular mechanisms underlying learning and memory. His laboratory uses genetically engineered animal models for human learning and memory disorders to investigate the molecular and cellular basis of human memory dysfunction. His laboratory has discovered a number of new roles and mechanisms of gene regulation in memory formation, focusing on studies of transcription factors, regulators of chromatin structure and other epigenetic mechanisms such as chemical modification of DNA.

October 12, 2009
UAB Media Relations
http://main.uab.edu/Sites/MediaRelations/articles/69997/

Sweatt and colleagues are using what they have learned about the molecular basis of memory formation to generate new treatments for humans with learning disabilities and aging-related memory dysfunction.

Established in 1999 by Evelyn Franks McKnight, the McKnight Brain Research Foundation supports research toward the understanding of memory and the specific influences of aging on memory. Evelyn and William L. McKnight, who was employed by the Minnesota Mining & Manufacturing (3M) Corporation for 59 years and served as either president or chairman of the board for 37 years prior to his retirement in 1966, were particularly interested in the effects of aging on memory.

McKnight, who was a nurse, shared her husband's belief that research is the key to tomorrow. The gifts provide for faculty salaries, purchase of laboratory instrumentation, pilot research funding and other scholarly activities.

About the McKnight Brain Research Foundation

The purpose of the McKnight Brain Research Foundation is to promote research and investigation of the brain in the fundamental mechanisms that underlie the neurobiology of memory with clinical relevance to the problems of age-related memory loss.

About UAB

Known for its innovative and interdisciplinary approach to education at both the graduate and undergraduate levels, the University of Alabama at Birmingham (UAB) is an internationally renowned research university and academic medical center whose professional schools and specialty patient care programs are consistently ranked as among the nation's top 50; find more information at www.uab.edu and www.uabmedicine.org.

Media Contact:
Bob Shepard
(205)934-8934
bshep@uab.edu

October 12, 2009
UAB Media Relations
http://main.uab.edu/Sites/MediaRelations/articles/69997/

BIRMINGHAM BUSINESS JOURNAL

Monday, October 12, 2009, 11:19am CDT

$10M endowment will support UAB research

Birmingham Business Journal - by Lauren B. Cooper Staff

A $10 million endowment has been established by the **University of Alabama at Birmingham** to support its brain research institute.

UAB announced Monday the endowment for its Evelyn F. McKnight Brain Institute, which is housed in the school's Shelby Interdisciplinary Biomedical Research Building, said a news release.

The endowment will support the institute and the Evelyn F. McKnight Endowed Chair for Learning and Memory in Aging from a $5 million gift from the McKnight Brain Research Foundation and a $5 million matching gift from UAB and other donors.

The foundation also gave $1 million for operating expenses, which, too, will be matched by the university.

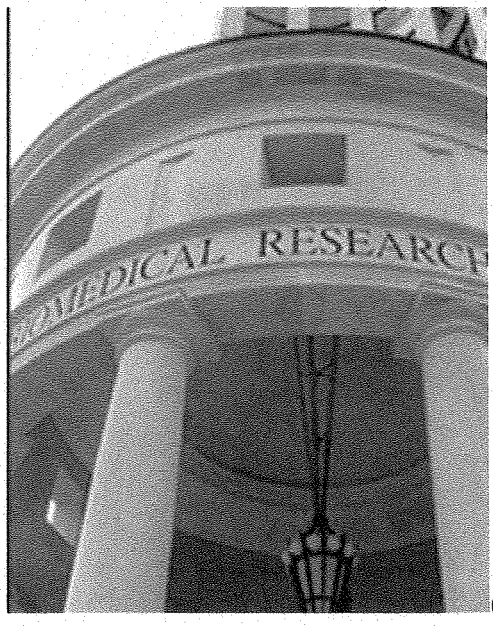
The brain institute was established at UAB in 2004, with an initial $5 million gift from the **McKnight Foundation**. Its molecular research focuses on learning and memory, which has generated new treatments for those with learning disabilities and aging-related memory dysfunction, said the release.

Everything Alabama

UAB joins to make $10 million endowment to study age-related memory loss

Published: Tuesday, October 13, 2009, 12:47 PM Updated: Tuesday, October 13, 2009, 1:06 PM

PRESS REGISTER By **Press-Register staff**



(Courtesy UAB Department of Neurobiology.)

BIRMINGHAM, Ala. -- The University of Alabama at Birmingham and the McKnight Brain Research Foundation of Orlando, Fla., announced today that they are establishing a $10 million endowment for the **Evelyn F. McKnight Brain Institute** at UAB to support the institute and the Evelyn F. McKnight Endowed Chair for Learning and Memory in Aging.

Officials said in a news release that the endowment is made possible by a $5 million gift from the McKnight Brain Research Foundation and a $5 million matching contribution from UAB and other donors.

"This generous gift from the McKnight Foundation will enable the institute and the endowed chair to exist in perpetuity at UAB," Dr. Robert Rich, senior vice president and dean of the UAB School of Medicine, said in a news release. "We are incredibly indebted to the trustees of the foundation for their investment in UAB's research to better understand age-related memory loss."

The institute was established at UAB with an initial $5 million gift from the McKnight Brain Research Foundation in 2004, followed by an additional $1 million in November 2005. The total amount of the new gift is $6 million, including $5 million for the endowment and an additional $1 million for operational funding,

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Sweatt's research focuses on molecular mechanisms underlying learning and memory. His laboratory uses genetically engineered animal models for human learning and memory disorders to investigate the molecular and cellular basis of human memory dysfunction. According to UAB, Sweatt's laboratory has discovered a number of new roles and mechanisms of gene regulation in memory formation, focusing on studies of transcription factors, regulators of chromatin structure and other epigenetic mechanisms such as chemical modification of DNA.

Sweatt and colleagues are using what they have learned about the molecular basis of memory formation to generate new treatments for humans with learning disabilities and aging-related memory dysfunction.

Established in 1999 by Evelyn Franks McKnight, the McKnight Brain Research Foundation supports research toward the understanding of memory and the specific influences of aging on memory.

UAB SYNOPSIS

VOL. 28, NO. 42, NOVEMBER 9, 2009

A UAB HEALTH SYSTEM PUBLICATION
www.uabhealth.org/synopsis

CELEBRATING 28 YEARS

FAQs: How to Protect Your Baby From Influenza Infection

With flu season in full swing, many women are asking questions about how to feed their babies and protect them from flu viruses. Here are a few commonly asked questions and their answers.

Q: What can I do to protect my baby from the flu?

A: First, make sure you wash your hands with soap and water or use an alcohol-based hand gel several times during the day, and specifically before feeding your baby. If you use hand sanitizer, make sure you rub it in until it is dry. Do not cough or sneeze in the baby's face during feeding or at any other time you and your baby are close to each other. Avoid touching your eyes, nose, or mouth. Germs often are spread when a person touches something contaminated and then touches his or her eyes, nose, or mouth. You can read more about these everyday precautions at cdc.gov/flu/protect/preventing.htm.

If possible, restrict caretakers to family members who are not sick. Avoid close contact with people who are sick.

Q: If I have the flu, what can I do to avoid spreading the illness to my baby?

A: If you are sick and cannot arrange for someone else to take care of your baby, wear a face mask if you can tolerate it. (More information about face masks is available at cdc.gov/h1n1flu/masks.htm.)

Cover your mouth and nose with a tissue when coughing or sneezing and throw the tissue away immediately. Wash your hands often or use an alcohol-based hand gel. For more tips on good health habits for preventing sickness from the flu, visit cdc.gov/flu/protect/habits.htm.

Q: Is it all right for me to feed my baby if I am sick?

A: According to the Centers for Disease Control and Prevention (CDC), infants are at higher risk for severe illness from H1N1 influenza. If you are breastfeeding or feeding your baby infant formula, take the following precautions:

- Ask someone who is not sick to feed and care for your baby.
- If there is no one else who can take care of your baby, wear a face mask at all times when you are feeding or caring for your baby.
- Diligently clean your hands with soap and water or use an alcohol-based hand gel and cover your mouth and nose with a tissue when coughing or sneezing. Throw the tissue away immediately.

The CDC has more tips on good health habits for preventing sickness from the flu on their Web site, cdc.gov/flu/protect/habits.htm

Q: Does breastfeeding protect my baby from the flu?

A: Breast milk protects babies' health in many ways. Mothers pass on protective antibodies to their baby during breastfeeding, and these antibodies help fight infection. Babies who are not breastfed get sick from infections like the flu more often and more severely than babies who are not breastfed.

If you are sick and breastfeeding, find a family member or friend who is not sick who can give the baby your expressed milk.

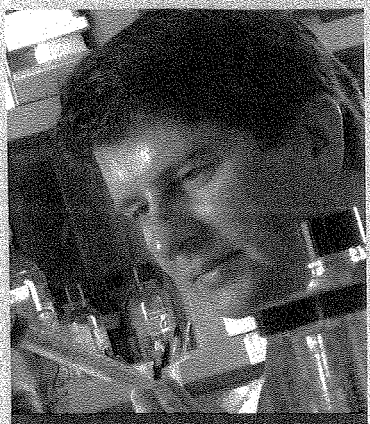
continued on page 3

Research NEWS

$10 Million Endowment Going to UAB's McKnight Brain Institute

UAB and the McKnight Brain Research Foundation are establishing a $10 million endowment for the Evelyn F. McKnight Brain Institute at UAB to support the institute and the Evelyn F. McKnight Endowed Chair for Learning and Memory in Aging.

The endowment is made possible by a $5 million gift from the McKnight Foundation of Orlando, Florida, and a $5 million matching contribution from UAB and other donors. An additional $1 million for operational funding will come from the foundation, and also will be matched by UAB.



DR. DAVID SWEATT

"This generous gift from the McKnight Foundation will enable the institute and the endowed chair to exist in perpetuity

continued on page 4

Coming UP

November 10 and 11 — Free professional portrait sessions for clinical physicians will be offered on both days from 8 AM to 4 PM. Sessions will be held at the West Pavilion second floor conference center lobby. To schedule an appointment, contact Carol Pierce at cpierce@uabmc.edu. Physicians are encouraged to wear their white coats. Pictures are used on the UABHS Web site's Physician Directory, www.uabmedicine.org/physicians, and in other UABHS publications.

November 17 — Professor of Humanities, Science, Technology, and Society and Director of The Doctors Kienle Center for Humanistic Medicine at Pennsylvania State University Philip K. Wilson, PhD, will present "Dissecting a Created Life: Anna Seward's 1804 Biography of Dr. Erasmus Darwin — the Grandfather of Evolution" at NOON at Lister Hill Library of the Health Sciences, Ireland Room.

McKnight Institute

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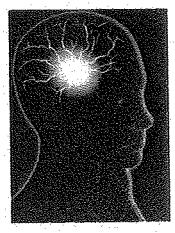

at UAB," says Robert R. Rich, MD, UAB senior vice president for medicine and dean of the School of Medicine. "We are incredibly indebted to the trustees of the foundation for their investment in UAB's research to better understand age-related memory loss."

"This wonderful gift provides us with a lasting base of support to continue our work, and we are grateful for it," says the Evelyn F. McKnight Endowed Chair David Sweatt, PhD, who chairs the UAB Department of Neurobiology and directs the institute.

The institute was created in 2004 and occupies 75,000 square feet of research space in the Richard C. and Annette N. Shelby Interdisciplinary Biomedical Research Building.

In the NEWS

GeoSentinel on UPI

UAB Travel Clinic Director David O. Freedman, MD, is codirector of the worldwide GeoSentinal online network of 48 travel and tropical medicine clinics on several continents. Unlike traditional surveillance systems, GeoSentinel tracks where travelers got sick, not where they live. He recently was quoted by United Press International on the H1N1 flu pandemic:

"Being able to track disease outbreaks in real time enables you to know, in real time, what works and what doesn't work in terms of treatment... Although the H1N1 virus is fairly mild compared with other novel flu viruses, it is very contagious. With the speed of modern travel, and the fact that our countries draw visitors from a lot of different nationalities, the ingredients for a pandemic were there. Americans were top of the list for exporting this disease."

UABSYNOPSIS
A UAB HEALTH SYSTEM PUBLICATION

Direct inquiries to:
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UAB Media Relations

Science Closing in on Mystery of Age-Related Memory Loss, Says UAB Neurobiologist

May 6, 2010

BIRMINGHAM, Ala. - The world's scientific community may be one step closer to understanding age-related memory loss, and to developing a drug that might help boost memory. In an editorial published May 7 in Science, J. David Sweatt, Ph.D., chair of the University of Alabama at Birmingham (UAB) Department of Neurobiology, says that drugs known as histone deacetylase inhibitors are showing great promise in stopping memory loss - and even in boosting the formation of memory in animal models.

Sweatt's editorial was published in conjunction with findings published in Science from researchers led by Shahaf Peleg at the European Neuroscience Institute at University Goettingen in Germany. The European researchers' findings supplement and support work done previously in Sweatt's laboratory.

"It's a real proof of concept," said Sweatt. "We've been studying histone deacetylase inhibitors for some 10 years. Studies in our lab and elsewhere strongly suggested that these drugs could potentially reverse aging-associated memory dysfunction.

"The new results from Peleg's group provide important proof-of-principal that this might be a viable approach to therapeutic interventions in aging."

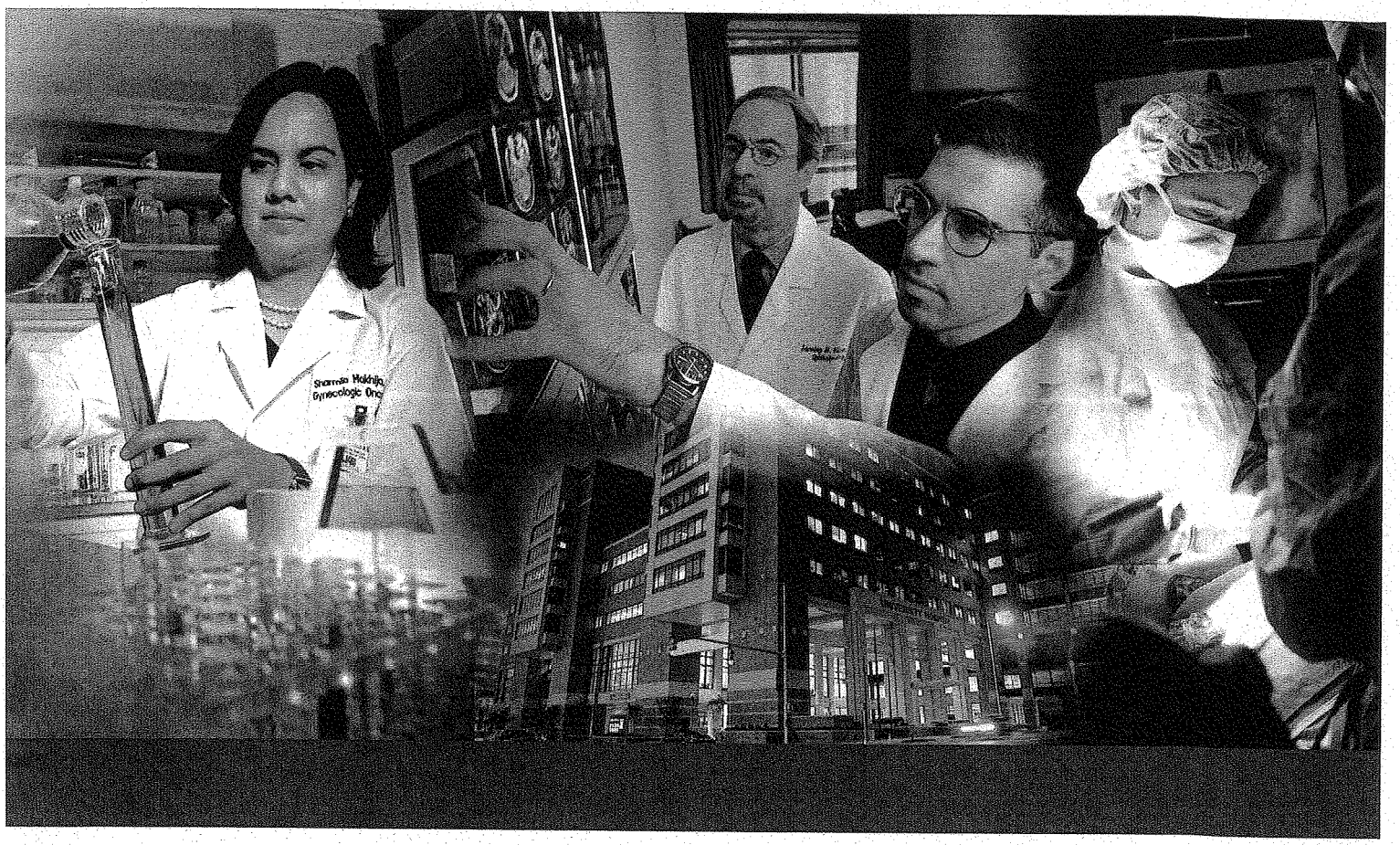
Sweatt, director of the Evelyn F. McKnight Brain Institute at UAB, cautions that the findings have so far only been observed in mouse models. He says further research is warranted to see if the findings translate to memory formation in humans.

He is especially encouraged because histone deacetylase inhibitors seem to be beneficial in both normal age-related memory decline, as evidenced by the Peleg team's findings, and in a mouse model of Alzheimer's disease, as reported by Sweatt's laboratory earlier this year in a different paper in Neuropsychopharmacology.

"These studies will hopefully lead to more effective prevention strategies to improve quality of life in the aged, as well as contribute to a better understanding of memory," Sweatt said

http://main.uab.edu/Sites/MediaRelations/articles/76347/

INSPIRATION UNDERSTANDING SUCCESS INGENUITY INNOVATION

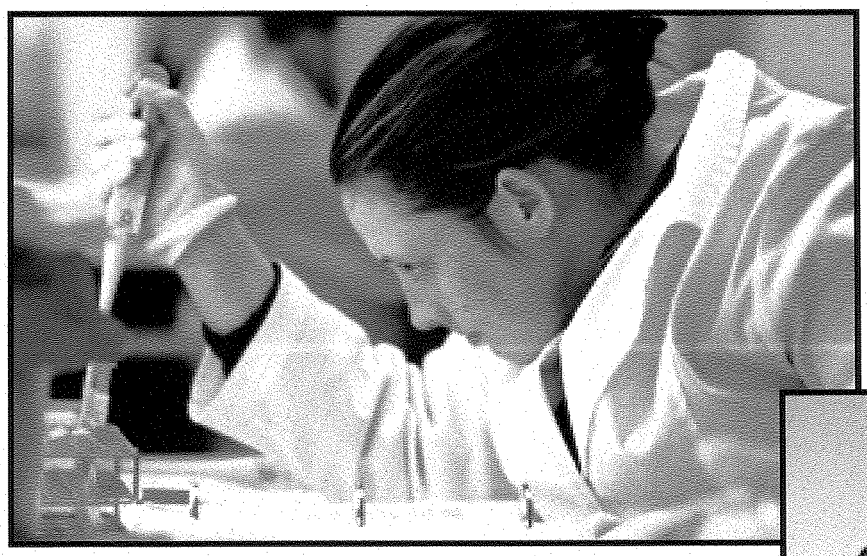


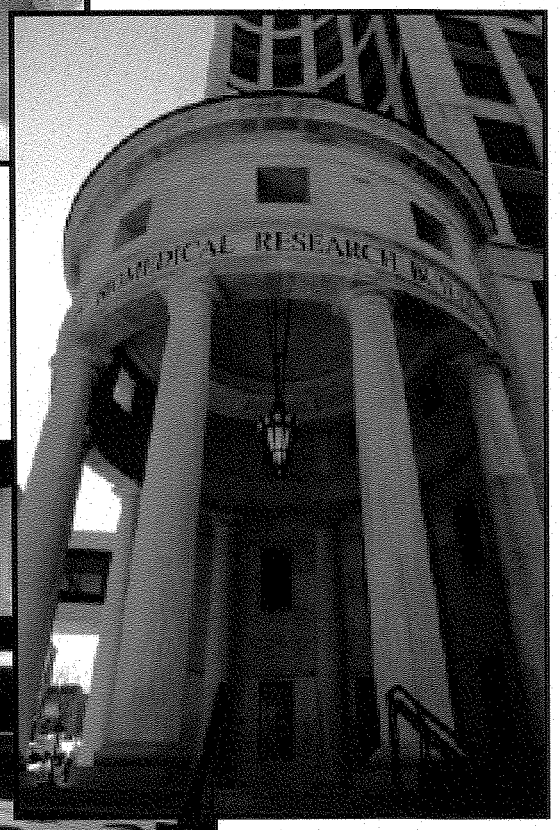
UAB Highlights

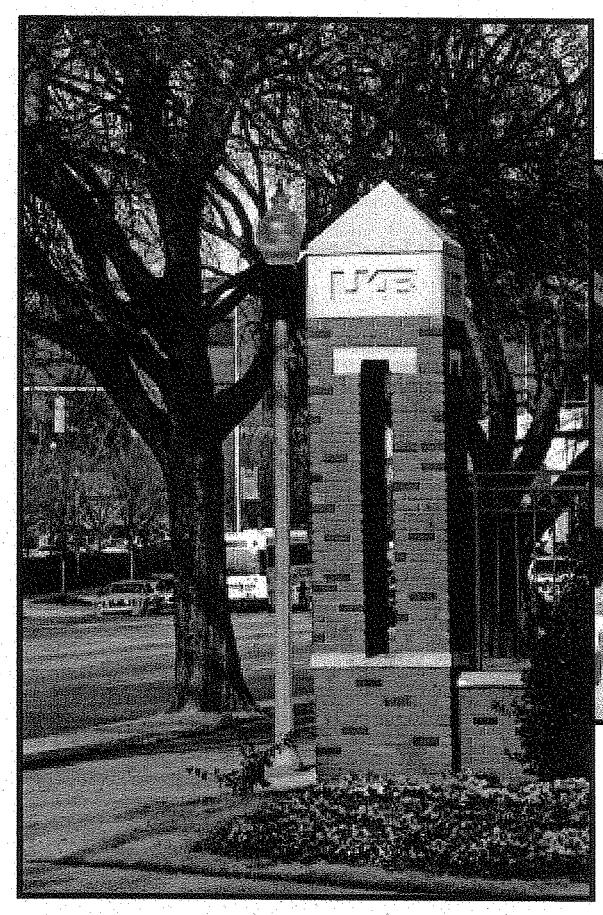
2010

UAB UNIVERSITY DEVELOPMENT

UAB Development Office






UAB

School of Medicine Highlights

THE SCHOOL OF MEDICINE has five medical specialties that ranked in the top 20 nationally by *U.S. News & World Report*. These specialties include AIDS, women's health, internal medicine, rural medicine, and pediatrics. The School is also ranked 27th in research and 43rd in the primary care category.

BEST DOCTORS IN AMERICA lists 297 UAB physicians in its latest edition. UAB faculty and physicians comprise 67 percent of the 446 Birmingham metropolitan area medical specialists in the latest list.

UAB HOSPITAL has eleven specialty programs listed among the nation's top 50 "America's Best" in the most recent U.S. News & World Report ranking. Six medical specialties ranked in the top 25: rheumatology, kidney disorders, gynecology, geriatrics, pulmonary, and urology. Other specialties ranked in the top 50 include heart and heart surgery; neurology and neurosurgery; cancer; ear, nose and throat; and gastroenterology. The hospital was one of only 152 hospitals, and the only hospital in Alabama or Mississippi, to make the magazine's national list.

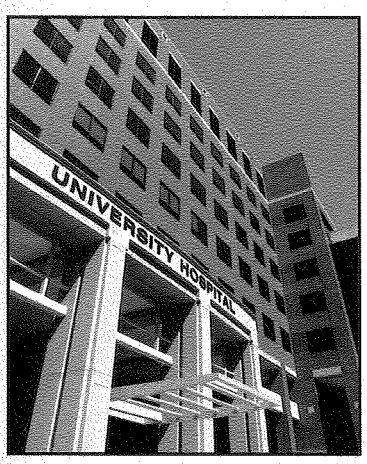
UAB HOSPITAL WAS SELECTED AS ONE OF AMERICA'S most customer-friendly hospitals by the American Alliance of Healthcare Providers. UAB earned the Hospital of Choice Award from the Alliance for its unparalleled commitment to good citizenship and community service.

THANKS IN LARGE PART to a most generous gift from Mr. W. Cobb "Chip" Hazelrig, the Hazelrig-Salter Radiation Oncology Center opened its doors in spring 2010 to a new state-of-the-art facility for groundbreaking research with advanced diagnostic and treatment modalities. In addition, the Jim Limbaugh Family Park of Hope Honoring Phyllis Limbaugh is located adjacent to the center and is a welcoming retreat for reflection.

THE WOMEN & INFANTS CENTER AT UAB opened February 2010. The Center, comprised of 430,000 square feet, provides comprehensive services in the areas of obstetrics, gynecology, and neonatal intensive care. Among the new amenities are 17 labor, delivery, and recovery rooms; a 56-patient, private-room Regional Neonatal Intensive Care Unit; and a 52-patient, private-room, special-care Continuing Care Nursery.

UAB HIGHLANDS, acquired in 2007, allows for the expansion of existing clinical services in orthopedic and plastic surgery. The Work Place, an occupational and rehabilitation medicine facility, and a new geriatric unit, Acute Care for Elders (ACE), is also housed at UAB Highlands.

THE UAB HEALTH SYSTEM CONTINUES TO GROW. In addition to The Kirklin Clinic, UAB Hospital, and surrounding facilities, the System also encompasses UAB Highlands, UAB Medical West, and multiple health centers in Greater Birmingham, Tuscaloosa, Huntsville, Selma, and Montgomery.



UAB'S NEW RHEUMATOID ARTHRITIS CLINIC at The Kirklin Clinic provides state-of-the-art care to adult rheumatoid arthritis patients. In light of the sometimes irreversible radiographic damage that results from delayed treatment, physicians can see patients with new-onset synovitis within two weeks of referral.

EQUAL ACCESS BIRMINGHAM free clinic is operated by an all-volunteer group of UAB medical students, undergraduates, and physicians who believe that high quality health care is the right of all individuals, families, and communities and that such care must be provided regardless of socioeconomic or health status. The free clinic is made possible through a partnership between the School of Medicine and M-POWER Ministries.

THE NATIONAL INSTITUTES OF HEALTH (NIH) HAS DESIGNATED UAB one of only six Diabetes Research and Training Centers (DRTC) in the country. This designation puts UAB at the forefront in the development of new methods to treat, prevent, and ultimately cure diabetes and its complications. The NIH award provides UAB with a $6.3 million grant over five years to grow its diabetes initiatives. The DRTC is part of the UAB Comprehensive Diabetes Center.

THE NIH AWARDED THE DIVISION OF NEPHROLOGY a five-year $4.23 million George M. O'Brien Kidney Research Center grant. UAB is one of just eight funded centers in the United States, putting UAB at the forefront in the development of new methods to treat and prevent kidney failure.

THE COMPREHENSIVE CANCER CENTER HAS IMPLEMENTED an Integrated Multidisciplinary Clinical Cancer Program (IMCCP) to distinguish the clinical, translational, prevention, and control characteristics unavailable at cancer centers that are not designated comprehensive. Five components of the IMCCP are in various stages of development: patient care coordinators, Cancer Center ambassadors, off-hours emergency access, the patient navigator program, and the research referral unit.

Education

THE EARLY MEDICAL PROFESSIONAL SCHOOLS ACCEPTANCE PROGRAM (EMPSAP) is a program for 12 mature graduating high school seniors. UAB's program increasingly attracts applicants not just from Alabama but from across the Southeast and nation. The minimal test scores recommended to apply for the program are 30 ACT and/or 1320 SAT. Those admitted to the program have an average ACT score of 34. The majority of the students completed math and science advanced placement courses in high school. An entering class typically consists of National Merit Finalists and students with perfect SAT scores.

MEDICAL SCHOOL NOW A TEAM SPORT AT UAB. UAB wants the physicians it trains to approach medicine as a team sport, so incoming first-year medical students will spend a day in team-building and leadership exercises. The medical students will work in small groups to accomplish a variety of tasks and challenges. "Teamwork is the primary goal," said Lawrence Tyson, Ph.D., associate professor of Counselor Education. "The quiet follower needs to learn leadership skills while the aggressive leader must understand that all members of a group bring valuable skills to a project. The teamwork of this core group should let them learn from the skill sets of each other."

THE CLASS OF 2011 BECAME THE FIRST CLASS TO study under a new curriculum based on interdisciplinary approaches to learning and scholarly activity. The new curriculum is organized into four essential elements:

- Pre-clerkship phase (20 months)
- Clerkship phase (12 months)
- Scholarly activity phase (3 months)
- Pre-residency phase (10 months)

TO ADDRESS PHYSICIAN SHORTAGE CONCERNS, the School of Medicine has increased class size by 10 percent and has increased the number of students assigned to the Tuscaloosa and Huntsville campuses to attract additional physicians to rural communities.

LAST MAY, THE SCHOLARLY ACTIVITY PHASE OF THE NEW INTEGRATED MEDICAL CURRICULUM launched for the very first time. During the 12-week block, students work on a scholarly project under the direction of a faculty mentor. Fifty-nine students selected the first scholarly activity block from May 4 to July 24, 2009. Although the majority of the students chose to work on the Birmingham campus during this block, some performed their scholarly activities at institutions in San Diego, Cincinnati, Washington D.C., Iraq, and Peru. Projects ranged from basic and patient-based research to the medical humanities and medical education.

SCHOOL OF MEDICINE STUDENTS CONSISTENTLY perform above the national mean on the United States Medical Licensing Exam Step 2 examination. The Step 2 examination is the examination that students take during their fourth year of study and provides insight into how well prepared students are upon entering residency programs.

THE 162 MEMBERS OF THE CLASS OF 2010 will undergo their residency training at hospitals from New England to California, with 76 percent remaining in the Southeast. Forty percent will remain in Alabama, and nearly 52 percent will conduct their residency training in one of the primary care fields.

UAB HAS RECEIVED FUNDS TO DEVELOP comprehensive curricula to prepare medical students, residents, and practicing physicians to care for complex older adults. The UAB Reynolds Care of the Complex Older Adult (or COCOA) Program is developing curricula that will enhance traditional geriatric training and address five key domains for the complex older patient: advanced illness and multimorbidity, transitions in care, family systems and self/caregiver management, cultural aspects of aging, and health literacy and health disparities.

THE EMERGENCY MEDICINE RESIDENCY TEAM was crowned the national champion in an annual competition sponsored by the Society for Academic Emergency Medicine. Modeled on the *Jeopardy!* game show, the event tested teams on their knowledge of emergency medicine topics. UAB defeated teams from Ohio State University, the University of Maryland, Georgetown University, Louisiana State University, and Orlando Regional Medical Center in the finals.

SHILPA REDDY, A SECOND-YEAR MEDICAL STUDENT, earned the prestigious Jack Kent Cooke Foundation graduate scholarship in recognition of her medical interests and extensive community service. She was one of just 35 recipients of 1,000 nominees nationwide. Reddy plans to continue to make an impact through the School of Medicine as a volunteer Spanish translator with Equal Access Birmingham and Cahaba Valley Health Care, which provide free health services to uninsured or underserved patients.

BETTY M. BOOKER, A BIOCHEMISTRY AND MOLECULAR GENETICS DOCTORAL STUDENT, is one of 12 Ph.D. candidates nationwide to win a 2009 UNCF (United Negro College Fund)-Merck Graduate Science Research Dissertation Fellowship. The award will support her research to decipher the role of chromosome dynamics in salmonella typhimurium and E.coli during fastidious growth.

Faculty and Research

IN A 2009 STUDY PUBLISHED BY THE ALABAMA COUNCIL OF GRADUATE DEANS, about 20 percent of the $3 billion research and development dollars spent in Alabama in 2007 was spent by Alabama research universities. UAB contributed more than half of the total academic research and development spending in Alabama in 2007 ($345 million out of $655 million total).

LISA GUAY-WOODFORD, M.D., IN THE DEPARTMENT OF GENETICS was cited for her contributions to the field of nephrology and received the top international award, the Lillian Jean Kaplan International Prize for Advancement in the Understanding of Polycystic Kidney Disease.

PETER G. ANDERSON, D.V.M., PH.D, IN THE DEPARTMENT OF PATHOLOGY received the prestigious 2009 Ellen Gregg Ingalls/UAB National Alumni Society Award for Lifetime Achievement in Teaching.

UAB WAS NAMED AN AMERICAN PARKINSON DISEASE ASSOCIATION (APDA) Center for Advanced Research—one of nine APDA-supported centers in major research institutions across the United States.

THE UAB MINORITY HEALTH AND HEALTH DISPARITIES RESEARCH CENTER has received over $13 million in federal funding to support educational, research, and community outreach focused on eliminating the health disparities of racial and ethnic minorities in Alabama.

IN 2008, UAB RECEIVED THE LARGEST SINGLE NIH GRANT in the institution's history. UAB was awarded $26.9 million to establish the Center for Clinical and Translational Science. A key focus of the grant is increasing interaction between UAB researchers, the community, and other investigators throughout the world—drawing upon UAB's traditional strengths of collaboration and interdisciplinary research.

THE NIH HAS PICKED UAB as one of just five institutions nationwide—and the only university in the Southeast—to lead a massive, national research assault on congestive heart failure. UAB is receiving $18 million to fund a Specialized Center of Clinically Oriented Research program focusing specifically on heart failure research.

THE AMERICAN SOCIETY OF TRANSPLANTATION SELECTED JOHN J. CURTIS, M.D., as the recipient of its highest honor, the Ernest Hodge Distinguished Achievement Award for 2009.

THE EVELYN F. MCKNIGHT BRAIN INSTITUTE at UAB has been made possible by generous gifts from the McKnight Brain Research Foundation, and the Foundation has committed to endowing the program so the critical research of the Institute will carry on perpetually. The Institute promotes research and investigation of the brain with a clinical relevance to the problems of age-related memory loss.

THE UAB COMPREHENSIVE DIABETES CENTER provides diabetes research and treatment programs in an effort to treat and cure the serious and growing national health crisis of diabetes. The NIH designated UAB as one of only six Diabetes Research and Training Centers in the country.

UAB WILL ESTABLISH A STATE-OF-THE-ART 800-MHZ NUCLEAR MAGNETIC RESONANCE FACILITY with a grant of $2 million from the National Center for Research Resources, part of the NIH.

TIM TOWNES, M.D., (BIOCHEMISTRY) ALONG WITH a team from the Whitehead Institute reported successfully curing sickle cell anemia in mouse models using induced pluripotent stem (iPS) cells, a new stem cell technique that uses skin cells and does not require embryos. In 2009, the UAB Stem Cell Institute was established to move into the clinical research and human therapy phase of this mission.

THE ALABAMA DRUG DISCOVERY ALLIANCE, a joint effort between the Southern Research Institute and the School of Medicine, is an exciting new venture designed to foster drug discovery and development at both institutions.

THE DEPARTMENT OF MICROBIOLOGY ESTABLISHED a new program in Mycobacterium Tuberculosis which includes bacterial geneticists and immunologists who are identifying new drug targets to overcome the microbe's ability to resist antibiotics. Scientists are also identifying new therapeutic targets in anthrax that focus on the bacterial spore.

EARLY TESTS OF A CYSTIC FIBROSIS DRUG PROVE promising as the clinical trial data shows the drug diminishes basic signs of the disease. Dr. Steven M. Rowe is heading UAB's portion of the trial.

UAB'S COMPREHENSIVE CANCER CENTER, the only National Cancer Institute-desginated comprehensive cancer center in Alabama and a five-state region, was awarded an $11.5 million renewal of its Specialized Program of Research Excellence grant for breast cancer research and treatment.

THE DEEP SOUTH RESOURCE CENTER FOR MINORITY AGING RESEARCH has been established and will be housed within UAB's Center for Aging. The Center will be aimed at increasing research into the health problems of older adult minorities.

RICHARD J. WHITLEY, M.D., (PEDIATRICS), has been appointed to the President's Council of Advisors on Science and Technology 2009 H1N1 Influenza Working Group.

BRUCE R. KORF, M.D., PH.D., (GENETICS), received the 2009 Award for Excellence in Human Genetics Education from the American Society for Human Genetics.

THE CENTER FOR NEURODEGENERATION AND EXPERIMENTAL THERAPEUTICS (CNET) is establishing a dystonia research program, partnering with Harvard Medical School and Mount Sinai Medical Center on a major government-funded study of the genetic underpinning of this neurologic condition that affects nearly half a million Americans. UAB received $1.5 million for this five-year study.

PREEMINENT INFLUENZA PHYSICIAN AND RESEARCHER DAVID KIMBERLIN, M.D., (MEDICINE) volunteered as a boys summer camp doctor in 2009 when three campers were confirmed to have H1N1. His case study of the outbreak, published February 2010 in the *Archives of Pediatrics & Adolescent Medicine*, describes the targeted preventive measures undertaken by Kimberlin's medical team, dozens of counselors, and camp staff to contain the virus among campers ages eight through 14 during the two-week period.

IN 2009, THE DIVISION OF GASTROENTEROLOGY AND HEPATOLOGY celebrated 50 years of excellence in education, research, and clinical care. Past trainees and former and present colleagues honored Basil I. Hirschowitz, M.D., professor emeritus, founding division director, and inventor of the first flexible fiberoptic endoscope, with a festschrift, a scientific and personal presentations celebrating the gastrointestinal scholar's career.

Campus-Wide

UAB RANKS NO. 3 IN THE NATION FOR student diversity in The Princeton Review's 2010 edition of its annual book, *The Best 371 Colleges*. UAB is the only university in Alabama to score in this category. UAB also ranked No. 11 for having the "Happiest Students" and No. 14 in the "Best Athletic Facilities" category. Students commented on how "integrated culture, education, and 'real world' experience..." is encouraged and that "no matter what you want to do...nothing is too big or off-limits; you can do it all here."

UAB MAKES THE PARADE COLLEGE A-LIST. You don't need to attend a fabled ivy-league school to get a big-league education. In PARADE, top high-school counselors from across the country give their recommendations on outstanding schools that often fly under the radar. UAB made the College A-List for its combined bachelor/graduate degree programs—many that can usually be completed in five years.

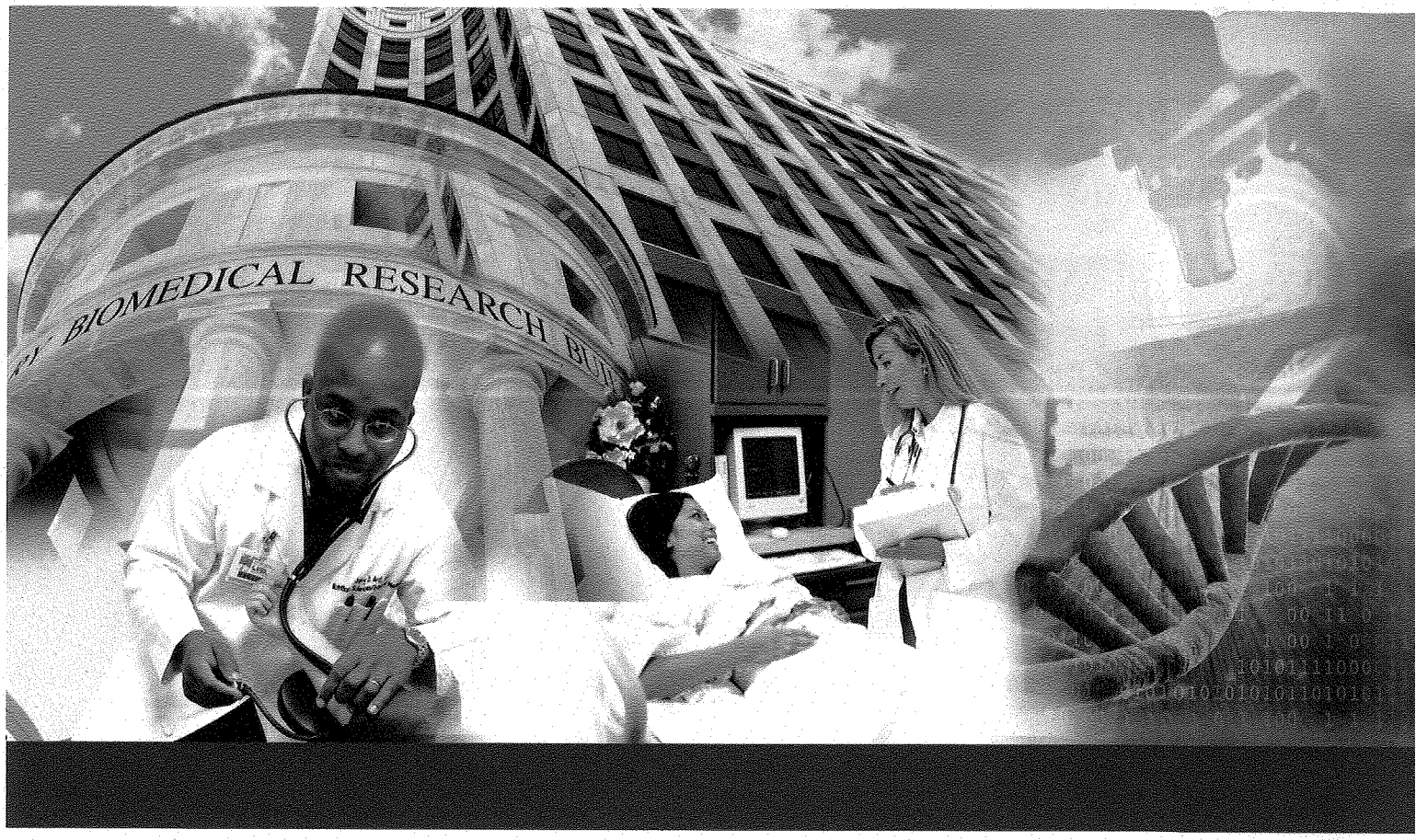
UAB IS AMONG A HANDFUL of universities classified by the Carnegie Foundation for both "high research activity" and "community engagement," which suggests how effectively the university harnesses its research to benefit the community—in terms of the economy, education, better health, and quality of life.

UAB STUDENTS CONTINUE TO GARNER PRESTIGIOUS national and international scholarships, fellowships, and other awards. Just since 2005, UAB has produced seven Fulbright Scholars, seven Goldwater Scholars, five National Science Foundation Graduate Fellows, three USA Today winners, seven Phi Kappa Phi Fellows and one NIH-Oxford-Cambridge Scholar.

UAB'S TOTAL ANNUAL IMPACT ON THE ALABAMA ECONOMY is $4.6 billion. UAB supports 61,025 jobs in the area and generates $302.2 million in tax revenue to state and local governments, including sales, property, and business tax payments. Further, $1 in every $25 in the state's budget is generated by UAB, and every $1 invested by the state in UAB generates $16.23 in the total state economy.

THE UAB RESEARCH FOUNDATION'S commercialization of faculty discoveries has, since 1986, created more than $31 million in royalty and license fees, generating 330 licensing agreements, and negotiated more than $22 million in research agreements for the University. It has also generated 33 startup companies based on its technologies and distributed more than $25 million back to the University, its inventors, and its various academic departments.

KNOWLEDGE SPIRIT ACHIEVEMENT DISCOVERY OPPORTUNITY VISION



UAB UNIVERSITY DEVELOPMENT

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