

BRAIN WAVES

Volume 2, Issue 2
March 1, 2005

Faculty Meeting Highlights

• Dr. David Watt will be leaving the College of Medicine as Executive Dean to become full-time Associate Provost. Perman is not planning to replace Watt's position, but will consider a possible Associate Dean for the Basic Sciences. Please inform Dr. Gash of any ideas you may have about this situation

• The department will be graduating six doctorates by the end of the first summer session.

• Dr. Doug Gould needs to get all of our graduate student publications for 2004. He also needs information on your lab's 395 independent study students: the semester they were in your lab,

name, social security number (if available) and major. Please send your citations and information to djgould@uky.edu. All Teaching Assistants will now have a more formal evaluation

An education isn't how much you have committed to memory, or even how much you know. It's being able to differentiate between what you do know and what you don't.
Anatole France (1844–1924)

process involving faculty observation and a letter grade. Please contact Dr. Gould for more information.

• Drs. Jennifer

Brueckner and Doug Gould are proposing an Anatomical Sciences Instruction Certificate that would be offered through the Graduate School. The certificate would allow people to gain a special focus on anatomical instruction through a series of focused courses. It will be designed to be very flexible within our graduate program.

• The department will be able to hire two junior faculty members (previously authorized) and two senior faculty members (from funding provided by the Provost's Initiative).



Don M. Gash, PhD, Chairman,
Anatomy & Neurobiology,
Director MRISC

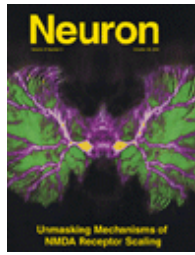
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Special points of interest:

- **Faculty Meeting** is scheduled for Friday, March 11 at Noon in MN 136.
- **March Mixer** is scheduled for **Friday, March 25, 3:30—5:00**, sponsored by the **Joseph Lab**.

Professional Announcements



Publications

PA Hardy, **DM Gash**, R Yokel, **A Andersen**, **Y Ai** & **Z Zhang** (2005) Correlation of R2 with total iron concentration in the brains of rhesus monkeys. *J Magn Reson Imaging*, 21(2): 118-27.

WA Cass, **LE Peters** & **MP Smith** (2005) Reductions in spontaneous locomotor activity in aged male, but not female, rats in a model of early Parkinson's disease. *Brain Res*, 1034 (1-2): 153-61.

R Ravikumar, I Fugaccia, **SW Scheff**, **JW Geddes**, C Srinivasan & M Toborek (2005) Nicotine attenuates morphological deficits in a contusion model of spinal cord injury. *J Neurotrauma*, 22(2):240-51.

PE Glaser, **TC Thomas**, **BM Joyce**, FX Castellanos & **GA Gerhardt** (2005) Differential effects of amphetamine isomers on dopamine release in the rat striatum and nucleus accumbens core. *Psychopharmacology*, 178 (2-3):250-8.

JJ Burmeister, M Palmer & **GA Gerhardt** (2005) Lactate measures in brain tissue with ceramic-based Multisite microelectrodes. *Biosens Bioelectron*, 20(9):1772-1779.

J Nickell, **F Pomerleau**, **J Allen** & **GA Gerhardt** (2005) Age-related changes in the dynamics of potassium-evoked L-glutamate release in the striatum of Fischer 344 rats. *J Neuroal Transm*, 112(1):87-96.

V Zaman, ME Nelson, **GA Gerhardt**, & B Rohrer (2004) Neurodegenerative alterations in the Nigrostriatal system of trkB hypomorphic mice. *Exp Neurol*, 190(2):337-46.

V Parikh, **F Pomerleau**, **P Huettl**, **GA Gerhardt**, M Sarter & JP Bruno (2004) Rapid assessment of in vivo cholinergic transmission by amperometric detection of changes in extracellular choline levels. *Eur J Neurosci*, 20(6): 1545-54.

H Li, CL Wood, TV Getchell, **ML Getchell** & AJ Stromberg (2004) Analysis of oligonucleotide array experiments with repeated measures using mixed models. *BMC Bioinformatics*, 5(1): 209.

K Kwong, RA Vaishnav, Y Liu, N Subhedar, AJ Stromberg, **ML Getchell** & TV Getchell (2004) Target ablation-induced regulation of macrophage recruitment into the olfactory epithelium of Mip-1alpha/- mice and restoration of function by exogenous MIP-1alpha. *Physiol Genomics*, 20(1):73-86

Publications cont.

BT Gold, DA Balota, MJ Cortese, SD Sergeant-Marshall, AZ Snyder, DH Salat, B Fischl, AM Dale, JC Morris & RL Buckner (2005) Differing neuropsychological and neuroanatomical correlates of abnormal reading in early-stage semantic dementia and dementia of the Alzheimer type. *Neuropsychologia*, 43(6):833-46.

BT Gold, DA Balota, BA Kirchoff & RL Buckner (2005) Common and Dissociable Activation Patterns Associated with Controlled Semantic and Phonological Processing: Evidence from fMRI Adaptation. *Cereb Cortex* (in press).

ED Hall, **PG Sullivan**, TR Gibson, KM Pavel, BM Thompson & **SW Scheff** (2005) Spatial and temporal characteristics of Neurodegeneration after controlled cortical impact in mice: more than a focal brain injury. *J Neurotrauma*, 22(2): 252-65.

KF Hauser, JV Aldrich, KJ Anderson, G Bakalkin, MJ Christie, **ED Hall**, **PE Knapp**, **SW Scheff**, IN Singh, B Vissel, AS Woods, T Yakovleva & TS Shippenberg (2005) Pathobiology of dynorphins in trauma and disease. *Front Biosci*, 10:216-35.

N EHage, JA Gurwell, IN Singh, **PE Knapp**, A Nath & **KF Hauser** (2005) Synergistic increases in intracellular Ca(2+), and the release of MCP-1, RANTES, and IL-6 by Astrocytes treated with opiates and HIV-1 Tat. *Glia* (in press).

JR Pauly, CM Charriez, MV Guseva & **SW Scheff** (2004) Nicotinic receptor modulation for Neuroprotection and enhancement of functional recovery following brain injury or disease. *Ann NY Acad Sci*, 1035:316-34.

SP Gabbita, **SW Scheff**, RM Menard, K Roberts, I Fugaccia & FP Zemlan (2005) Cleaved-tau: a biomarker of neuronal damage after traumatic brain injury. *J Neurotrauma*, 22(1):83-94.

PG Sullivan, AG Rabchevsky, PC Waldmeier & **JE Springer** (2005) Mitochondrial permeability transition in CNS trauma: cause or effect of neuronal cell death? *J Neurosci Res*, 79(1-2):231-9.



Grants

James Geddes: "Calpain Inhibition Strategies for Spinal Cord Injury" from NINDS, 01/01/05-12/31/05. Total \$ 340,631.

Zhiming Zhang: "Aging of Central Dopaminergic Systems in Primates: Core B: Primate Core Facility" from NIA, 02/01/05-01/31/06. Total \$ 177,656.

Greg Gerhardt: "Neurochemical Studies of the Aging Basal Ganglia in Rhesus Monkeys" from NIA, 02/01/05-01/31/06.

Don Gash & Richard Grondin: "Motoric Declines in Aging Rhesus Monkeys: Quantitative Behavioral and Neuroanatomical Analyses" from NIA, 02/01/05-01/31/06. Total \$ 219,398.



Don Gash: "Aging of Central Dopaminergic Systems in Primates" from NIA, 02/01/05-01/31/06. Total \$ 26,610.

Anders Andersen: "Aging of Central Dopaminergic Systems in Primates: Core C: Data Analysis" from NIA, 02/01/05-01/31/06. Total \$ 36,239.

Zhiming Zhang: "Motoric Declines in Aging Rhesus Monkeys: MRI Studies of the Nigrostriatal Dopaminergic System in Primates" from NIA, 02/01/05-01/31/06. Total \$ 175,667.



Professional Announcements



Seminars

Monday, March 7—“Space Flight, Cachexia, and Muscle Weakness”, Dr. Michael Reid, University of Kentucky, Department of Physiology. 4:00 PM, MN 463.

Monday, March 14—“Second-by-Second Recordings of L-Glutamate in ALT and GDH Overexpressing Mice”, Kevin Hascup and “Glutamate and Dopamine Interactions in D4 Knockout Mice: Implications for ADHD”, Theresa Currier-Thomas, Anatomy & Neurobiology Graduate Students

Monday, March 21—“Second-by-Second Recordings of L-glutamate in the Striatum and Prefrontal Cortex of Unanesthetized Rats”, Erin Rutherford, Anatomy & Neurobiology Graduate Student

Monday, March 28—Sarah Martin, Anatomy & Neurobiology Graduate Student

Monday, April 4—TBA

Monday, April 11—TBA

April—“A Developmental fMRI Study: Face and Object Recognition”, Ann Gathers, Anatomy & Neurobiology PhD candidate, Dissertation Defense. TBA

Monday, April 18—Go Vijitruth, Anatomy & Neurobiology Graduate Student

Monday, April 25—Jeremiah Gates, Anatomy & Neurobiology Graduate Student

Monday, May 2—Michael Smith, Anatomy & Neurobiology Graduate Student

Monday, May 9—Yiqin Xiong, Anatomy & Neurobiology Graduate Student

Monday, May 16—Vidya Nukala, Anatomy & Neurobiology Graduate Student

Monday, May 23—Justin Nickell, Anatomy & Neurobiology Graduate Student

Monday, June 6—Matt Joyce, Anatomy & Neurobiology Graduate Student

Monday, June 13—Ying Deng, Anatomy & Neurobiology Graduate Student

Monday, June 20—Lamin Mbye/Laurie Davis, Anatomy & Neurobiology Graduate Student

Monday, June 27—April Richardson, Anatomy & Neurobiology Graduate Student

“As to disease make a habit of two things—to help, or at least, do no harm” - Hippocrates (460 BC–377 BC)

All seminars will be held in MN 463 at 4:00PM unless otherwise noted.

For updates and further options please check out the website

<http://www.mc.uky.edu/coa/events.asp>

Professional Announcements

Monday, March 14—Kevin Hascup: Seminar Abstract Recently, two knock in mouse models have been developed that up-regulate neuronal activity of glutamate dehydrogenase (GDH) and glutamate-pyruvate transaminase (GPT). Transgenic mice were generated with mouse GDH and rat GPT genes expressed under the control of neuron specific enolase promoter. While initial studies have shown increases in expression and activity of these two enzymes, the effects of these enzymatic changes on glutamate (Glu) release dynamics *in vivo* are unknown. We used *in vivo* electrochemical recordings to investigate Glu release in the striatum of anesthetized wildtype, GPT and GDH knock in mice. Glu release was evoked with local applications of potassium and extracellular Glu levels were measured using a ceramic-based microelectrode array configured for Glu recordings. No differences in the maximum amplitudes of potassium-evoked Glu signals were seen between wildtype and GPT mice. However a significant ~60% increase in potassium-evoked Glu release was observed in GDH mice compared to both wildtype and GPT knock in animals. Furthermore, GPT mice had a ~130% slower Glu uptake rate compared to wildtype animals, while GDH mice exhibited significant 100 and 363% faster Glu uptake rates compared

to wildtype and GPT mice, respectively. These data indicate that up-regulation of GPT and GDH affects potassium-evoked release of Glu in the mouse striatum. Additional studies are being carried out to investigate the effects of the GDH and GPT knock in mice on Glu uptake *in vivo*. ~~~~~

Monday, March 14—Theresa Currier-Thomas: Seminar Abstract: Alterations in dopamine (DA) neuron dynamics have been implicated in the pathophysiology of Attention-Deficit/ Hyperactivity Disorder (ADHD) especially with respect to D4 receptors. In our present studies, we are utilizing a dopamine receptor D4 knockout mouse (D4KO) to analyze DA and glutamate (Glu) systems. D4KO and wildtype mice (D4R +\+) are being used to investigate behavioral and neurochemical properties of the in the striatum (STR) and nucleus accumbens (NA). Preliminary studies show that D4KO mice exhibit differential sensitivity to d-AMP and have altered DA mcompared to wildtype controls. Measures of Glu regulation in striatum and NA using *in vivo* voltammetry methods are being carried out. These studies to date show that alteration to the D4 receptor result in animals with altered circuitry. Such studies may contribute to a greater understanding of the pathophysiology of ADHD.

Education is not to reform students or amuse them or to make them expert technicians. It is to unsettle their minds, widen their horizons, inflame their intellects, teach them to think straight, if possible. Robert M. Hutchins

Monday, March 21—Erin Rutherford Seminar Abstract L-Glutamate (Glu), the predominant excitatory neurotransmitter in CNS, is associated with a wide variety of functions including motor behavior, cognition, memory and sensory perception. In these studies, we have improved our headstage amplifier, allowing us to use the full potential of our multisite microelectrode arrays to measure signals from 4 sites simultaneously in the brain of freely moving rats. The microelectrodes were configured for enzyme-based (Glu-oxidase) detection of Glu. Amperometry was used to measure Glu levels during stress responses in the striatum of unrestrained awake animals. The enzyme layer remained active for up to 3 weeks *in vivo*. The microelectrodes responded to local applications of Glu (200 mM, 3-5 μ l) and remained patent up to 90 days (H₂O₂, 8.8 μ M, ~1 μ l) with minimal observable damage at the site of implantation. On the first day, a 5 mins tail pinch induced a rapid (spike) Glu release (30-40 μ M) followed by a sustained signal (4-5 μ M) lasting the time of the stimulation, which quickly returned to basal levels (<10 mins). By contrast, on subsequent days, only the sustained Glu signal was observed. Our data support that the microelectrode arrays can be used for fast, sensitive and reliable measures

of Glu release in freely moving rats. (Supported by DARPA N66001-02-C-8085, NSF DBI-9987807, USPHS grants MH01245 and DA017186)

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**Monday, March 28—Sarah Martin: Seminar Abstract:** Human Immunodeficiency Virus (HIV) is a disease of the immune system. A critical complication that is known to occur in infected HIV patients etabolism in the NA as is neurological impairment, termed HIV dementia (HIVD). It is known that HIVD is not correlated with viral load, but is connected to inflammation. With this in mind, investigators have explored specific viral proteins. One of the proteins that is found to play a role in HIVD is Tat. Tat is known to cause cellular stimulation, leading to neurotoxicity and microglial inflammation. Tat induced microglial activation, leads to brain inflammation. Accordingly, our research is geared toward determining how Tat activates microglial cells. Specifically my research will determine the signal transduction of Tat induced microglial activation

# Comings & Goings

## Departmental Birthdays

**Happy Birthday!**



- 03/06 ~ Jadwiga Turchan
- 03/07 ~ Dr. Subbu Apparsundaram
- 03/07 ~ Bin Xing
- 03/08 ~ Xuan Nguyen
- 03/10 ~ Robin Lindsay



- 03/14 ~ Chunmei Wang
- 03/18 ~ Dr. Dave Peck
- 03/23 ~ Dr. Pam Knapp
- 03/29 ~ Jennifer Allen
- 03/30 ~ Lamin Mbye

**Yan Chen**, Graduate Student in Dr. Don Gash's lab completed her requirements for her PhD degree by passing her Dissertation Defense on February 10. Yan's dissertation was on "Effects of Glial Cell Line-Derived Neurotrophic Factor (GDNF) on Stem/Progenitor Cell Proliferation and Differentiation". Dr. Chen will remain in Dr. Gash's lab working with them on their GDNF studies while looking at options to further her own studies. Yan is pictured here with her parents, Professor Zhongrong Lu and Professor Kequan Chen, after passing her defense.



## 2005 Mixer Themes



**January**—Admin Staff "Chocolate Paradise"

**February**—None

**March**—Joseph Lab "The Mad Hatter's Tea Party"

**April**—

**May**—Gash Lab

**June**—MacPherson/Ginn "Cookout"

**July**—Keller Lab

**August**—Gerhardt Lab

**September**—Snow Lab

**October**—

**November**—Teaching Faculty

**December**—Departmental Holiday Potluck

We still need folks to sign up to sponsor a mixer for 2005. Please stop by & see Angel or call her at 3-5155.



Who is going to challenge the Gerhardt Lab for the trophy this year?

## NEW EDICT ON MIXER VOTING FROM THE CHAIR



In order to create a more equitable voting platform for the mixers, I would like to propose allowing each lab/group two votes for best mixer. Each lab/group would choose their first place vote and a different second place vote. This would allow the smaller labs to have an equal shot at winning the departmental award. If you have any concerns with this change please contact Dalene at [darice2@email.uky.edu](mailto:darice2@email.uky.edu).

I would also like to remind you that the mixers are intended as a time to gather and relax. They need not be elaborate productions in order to be successful. The mixers are supposed to be fun for everyone, whether or not you choose to have contests or prizes. Just enjoy your co-workers and friends in the department.



# LEXINGTON CONFERENCE ON TRANSLATIONAL NEUROSCIENCE

April 28 – 29, 2005

**Co-organizers: Professors Don M. Gash and Greg A. Gerhardt**

**Purpose:** To bring together biomedical engineers, neuroscientists and physicians working on BRAIN INTERACTIVE DEVICES (BIDs). This is an emerging scientific area with applications the early stages of clinical testing or in clinical use. The meeting will explore common issues, such as the brain - implant interactions and CNS responses/plasticity, that link these applications. Early clinical experiences with using BIDs are raising many questions that will require extensive study at the basic science level in appropriate model systems. The goals of the meeting are: 1) To bring together the leading members of the scientific community working on BIDs. 2) To determine the critical gaps in our knowledge about the mechanisms of action, long term effects and pathophysiology of BIDs. 3) To assess the clinical effects (neurosurgical, neurological and psychiatric) of BIDs. 4) To identify and prioritize future directions for BIDs research. 5) to better understand the patient community receiving BIDs, their perspectives and needs.

**Session 1—CNS Prosthesis** ... Drs. Greg Gerhardt and Theodore Berger, Co-organizers

**Session 2—Parkinson's Disease and Other CNS Disorders** ... Drs. Jean Saint-Cyr and Don Gash, Co-organizers

**Session 3—Spinal Cord Injury** ... Drs. Alexander Rabchevsky and Edward Hall, Co-organizers

# Employee of the Quarter Nomination Form

The Quarterly Employee Awards are announced in April (for nominations submitted January through March); July (April through June); October (July through September) and January (October through December). The Employee of the Year Award will be selected from all nominations throughout the year and will be announced annually at the departmental Holiday Luncheon in December. **Due to Julie Poole or Angel Schumacher by March 31, 2005.**

When considering someone for the award, think of the individual who has made your job easier or assisted you in performing your job. To complete the nominations please complete the following questions. Use additional paper or the back of this if necessary.

Date: \_\_\_\_\_ Candidate: \_\_\_\_\_

Nominator: \_\_\_\_\_

Is this individual a regular full-time employee in the Department of Anatomy & Neurobiology? \_\_\_\_\_ Yes \_\_\_\_\_ No

1. What attributes or actions make this individual worthy of your nomination? Give examples.

2. How is this individual an asset to the Department of Anatomy & Neurobiology? Give examples.

3. How have you seen this individual contribute to the UK and/or greater community? Give examples.

4. With 1 = average and 5 = outstanding, please rank the nominee in the following areas:

Quality of work: 1 2 3 4 5

Attitude toward performing job duties: 1 2 3 4 5

Problem solving skills: 1 2 3 4 5

Willingness to help others: 1 2 3 4 5

Service to the department/university: 1 2 3 4 5

Submit to Julie Poole in 305 MRISC, 0098 Phone: 323-5242

MN 225 Medical Sciences Building  
Lexington, KY 40536-0298  
Phone: 859-323-5155  
Fax: 859-257-6700

<http://www2.mc.uky.edu/neurobiology/>

Please send comments & submissions to Dalene Rice at [darice2@email.uky.edu](mailto:darice2@email.uky.edu) or call 859-323-8260.

**Next Deadline is March 24, 2005**

## Available Training

### Training for the Labs

The University requires safety training classes to be completed before beginning certain types of work. The requirements apply to all individuals involved in the covered work, including faculty, staff, students, postdocs, visiting researchers and volunteers. To find out what classes you need to take, consult the [Training Checklist](#).

**NOTE:** Anyone who works with chemicals in a laboratory must complete the following three classes: Chemical Hygiene Plan/Laboratory Safety, Hazardous Waste, and Fire Extinguisher Use.

### Chemical Hygiene Plan/Lab Safety

220 Scovell Hall or [online](#).

### Bloodborne Pathogens

This class is available upon request and [online](#).

Hazardous Waste 220 Scovell Hall or [online](#).

**Initial Radiation Safety:** Initial Radiation Safety (~ 15 minutes total) is offered every day at 1:30 pm at the Radiation Safety Office, 102 Animal Pathology Building (other times can be arranged). You must bring two completed forms with you: On-Site Radiation Safety Training Form and Radiation Worker Registration Form, both signed by your Authorized User or unit supervisor. If you have questions, contact Tracy Cayson at 323-6777.

### Basic Radiation Safety

03/17 ... Thursday ... 1—4 ... NURS214

04/12 ... Tuesday ... 9—12 ... NURS214

05/23 ... Monday ... 1—4 ... NURS214

### Advanced Radiation Safety

This class is only available [online](#).

### Fire Extinguisher Use [online](#)

**NOTE:** [Online courses can only be taken using a UK computer.](#)

**Corporate Compliance Training** is a **MANDATORY** training for all individuals who receive a paycheck from the UK Medical Center. It is only offered from 3:00—3:30 p.m. during the UK Hospital Orientation. Ignoring this requirement can result in dismissal from employment at the University of Kentucky.

### Human Resource

### Development

### course offerings

<http://www.uky.edu/HR/HRD/>

<http://www.uky.edu/IS/Training/>

03/03 ~ PowerPoint 2003 QuickStart

03/08 ~ Communicating Multi-Culturally

03/08 ~ Word 2003 QuickStart

03/09 ~ Outlook QuickStart

03/10 ~ Personal Decision Making

03/10 ~ Excel 2003 QuickStart

03/15 ~ Intermediate PowerPoint 2003

03/16 ~ Intermediate Outlook 2003

03/17 ~ Trip Manager

03/22 ~ Critical Thinking

03/23 ~ Basic HTML 2: Images & Tables

03/24 ~ Intermediate Word 2003

03/31 ~ Publisher 2003 QuickStart

04/01, 04/08, 04/15 ~ 7 Habits of Highly Effective People

04/05 ~ PowerPoint 2003 QuickStart

04/05 ~ Family Medical Leave (FMLA)

04/06 ~ Office 2003 QuickStart

04/07 ~ Excel 2003 QuickStart

04/11 ~ Resolving Workplace Conflicts

04/14 ~ Intermediate PowerPoint 2003

04/18 ~ Managing Staff Conflict

04/19 ~ Excel Charts & Graphs

04/20 ~ Intermediate Outlook 2003

04/21 ~ Managing Your Boss

04/26 ~ Personality Differences

04/26 ~ Intermediate Excel 2003

For additional details, signing up, location, etc ... please check out the training calendar for Human Resource Development as noted above.



**Never Stop Learning!!!!**