CAH Interdisciplinary Research Award
Application Form
Due Date: August 18, 2008 at 5:00 PM

List researchers involved in project:
A minimum of 3 different budget units required, 2 must be from the College of Arts and Humanities (CAH)

Ayako Yonetani Music
Lead PI CAH Budget Unit

Stephen M. Fiore Philosophy

Kiminobu Sugaya Burnett, Biomedical Science
Co-PI CAH Budget Unit

Co-PI UCF Dept. or Company
Jeffrey S. Bedwell Psychology

Co-PI UCF Dept. or Company

Co-PI UCF Dept. or Company

Lead PI signature: ___________________________ Date

Proposal Requirements:
Proposals will be peer reviewed by a panel for selection. Awards will be distributed based on available dollars. Proposal packages must not exceed 20 pages and must include the following sections in the order listed below:

Section 1: Application - Completed CAH Interdisciplinary Research Award Application
Section 2: Research Problem or Activity - Statement of the problem or activity
Section 3: Research Project - The work to be accomplished and the associated time frame
Section 4: Budget - A budget detailing the kind and amount of expenditures to be made
Section 5: Future Plans - Provide evidence of the continuity of the work and/or the potential for future funding
Section 6: Vitas - Current vitas for the PI and Co-PIs; not to exceed 2 pages each
Section 7: Appendix (optional): Any additional information that you feel would be useful to the selection committee

Hand-deliver completed and signed application and 5 copies of the proposal to the CAH Research Office Located in the CAH Dean's Office by 5:00 PM, August 18, 2008

☐ Accepted Received by: ___________________________ Date: ____________  ☐ Declined
**2008-2009 Tentative CAH Interdisciplinary Research Award Guidelines**

The primary focus of these awards is to encourage research, creative and grant activities and to generate complete research projects that will enter the mainstream of research in a form that will continue to generate public interest and produce income for an extended period. These awards seek to fund selected interdisciplinary research and to encourage traditional grant applications. These awards will be peer reviewed (panel) for selection and distributed based on available dollars. All proposals must include:

1. Statement of the problem or activity
2. Evidence of the continuity of the work
3. The work to be accomplished and the associated time frame
4. A budget detailing the kind and amount of expenditures to be made

The funds will be placed in the CAH Research Initiative account, an E&G department administered jointly by the PI’s home department and the CAH Dean's Office. The money may be spent as non salary in the form of OPS for students, consultants or as Operation Funds for supplies, equipment or other resources. The funding may not be used for faculty buyouts, overloads, course releases, summer salaries, or food purchases.

All CAH budget units are eligible to submit proposals. The awards seek to fund selected interdisciplinary research that encourages both grant proposals with an entrepreneurial focus and applied research projects that produce an end with continuing local, regional and national exposure. Theatrical performances with religious, historical and philosophical focus, visual art exhibitions that combine reading and music creative publishing ventures involving animation or films, or a combination of these forms are encouraged. Editions of novels, essays, or poems that celebrate our historical or literary heritage, and projects and proposals that inform and celebrate the application of humanistic methods to modern life are a few examples of eligible applications content.

**RESEARCH/CREATIVE PROJECTS AWARDS**

- Monies will be awarded to teams composed from two or more CAH budget units who present completed proposals for existing grants to a panel of jurors.
- The panel will recommend to the Dean award amounts to be deposited in the CAH research initiative account.
- The panel will consider proposals that strengthen teaching and learning, support original scholarship, provide opportunities for lifelong learning, and provide access to cultural and educational resources.

**GRANT/CONTRACT PROJECTS AWARDS**

- Monies will be awarded to teams composed from at least two CAH budget units. A partner from a UCF budget unit or a representative from an outside not-for-profit or commercial venue can be considered as additional partners but will not be considered the second partner in the proposal.
- The panel will recommend to the Dean award amounts to be deposited in the CAH research initiative account.
- The panel will consider actual applied research projects that have high probability for continuing exposure, continuing potential income generation, or the potential to receive external funding from private or federal sources.

**Proposal Deadline:** August 18, 2008 at 5:00 PM to the CAH Deans Office
“Music may improve brain functions”

Section 2: Research Problem or Activity

Until recently, most neuroscientists thought we were born with all the neurons we were ever going to have. As children we might produce some new neurons to help build the pathways - called neural circuits - that act as information highways between different areas of the brain. But scientists believed that once a neural circuit was in place, adding any new neurons would disrupt the flow of information and disable the brain’s communication system.

In 1962, scientist Joseph Altman challenged this belief when he saw evidence of neurogenesis (the birth of neurons) in a region of the adult rat brain called the hippocampus. He later reported that newborn neurons migrated from their birthplace in the hippocampus to other parts of the brain. In 1979, another scientist, Michael Kaplan, confirmed Altman's findings in the rat brain, and in 1983 he found neural precursor cells in the forebrain of an adult monkey.

These discoveries about neurogenesis in the adult brain were surprising to other researchers who didn't think they could be true in humans. But in the early 1980s, a scientist trying to understand how birds learn to sing suggested that neuroscientists look again at neurogenesis in the adult brain and begin to see how it might make sense. In a series of experiments, Fernando Nottebohm and his research team showed that the numbers of neurons in the forebrains of male canaries dramatically increased during the mating season. This was the same time in which the birds had to learn new songs to attract females.

Why did these bird brains add neurons at such a critical time in learning? Nottebohm believed it was because fresh neurons helped store new song patterns within the neural circuits of the forebrain, the area of the brain that controls complex behaviors. These new neurons made learning possible. If birds made new neurons to help them remember and learn, the brains of mammals might too.

Other scientists believed these findings could not apply to mammals, but Elizabeth Gould later found evidence of newborn neurons in a distinct area of the brain in monkeys, and Fred Gage and Peter Eriksson showed that the adult human brain produced new neurons in a similar area.

For some neuroscientists, neurogenesis in the adult brain is still an unproven theory. But others think the evidence offers intriguing possibilities about the role of adult-generated neurons in learning and memory. However in our previous study supported by NIH, human neural stem cells migrated and differentiated into neurons and glia after transplantation into 24-month-old rat brains and significantly improved the cognitive functions of these animals (Qu et al., 2001).

These increasing evidences that enriching the environment, including listening to music can improve cognitive and motor deficits following a variety of brain injuries. When rats were repeatedly exposed to the complex music (Mozart Sonata (k. 448)), they completed the maze more rapidly and with fewer errors than the rats assigned to the other groups (minimalist music (a Philip Glass...
composition), white noise or silence) (Rauscher et al., 1998). This result suggests that exposure to complex music induces improved spatial-temporal learning in rats, resembling results found in humans. Taken together with studies of music-induced neural plasticity, these results suggest a similar neurophysiological mechanism for the effects of music on spatial learning in rats and humans.

Anti-depressant treatment is known to increase stem cell population in the brain. Since it takes time to show the effect on the behavior, this increased number of stem cells and neurogenesis may play an important role in the therapeutic action. Music therapy is known to be effective in treating depression. Although no study has been done to investigate correlation between stem cell population and depression, listening music may also reduce depression by increasing stem cell population in the brain.

Although music therapy may provide significant improvement in memory and mood, such mechanism of action is not clear. This may pose an important problem, because it is difficult to identify the target diseases for music therapy.

Our hypothesis is that music may improve memory impairment during aging by increasing neural stem cell population and neurogenesis. The rationale for the proposed research is that since (1) enriched environment, including listening music, improve cognition and mood, (2) learning process of singing in birds involves generation of new neuronal circuit and (3) increasing neural stem cells improve mood, music may affect brain function by neurogenesis.

Preliminary study (conducted by the same team this year)

Methods

Participants
A total of 18 people participated in the study. Of those 18 participants, 4 of them either did not follow directions, or did not complete the study, and were, therefore, excluded from the analysis. Of the 14 remaining participants 3 were male and 11 were female. The average age of the male participants was 74.67 years (SD = 12.22), and the average age of female participants was 75.82 (SD = 6.42).

Design
A 2 x (2 x 2) mixed between and within design was used with mood (higher mood versus lower mood) as the between factor and with time of the test (pre versus post) and test type (Paper Folding Test versus Math Best) as within participant factors (refer to Table 1).
Table 1. Conceptual representation of experimental design.

<table>
<thead>
<tr>
<th>Mood</th>
<th>Timing of Test and Test Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Listening</td>
</tr>
<tr>
<td></td>
<td>Math Test</td>
</tr>
<tr>
<td>Lower Mood</td>
<td></td>
</tr>
<tr>
<td>Higher Mood</td>
<td></td>
</tr>
</tbody>
</table>

Testing Stimuli
Cognitive Questions. Participants were asked to complete a short battery of tests assessing differing cognitive abilities. This included a subset of basic arithmetic questions and a test of visuo-spatial processing as assessed by the Paper Folding Test. These tests were divided in half for the pre- and post-test administrations.

Affective Questions. Following the procedure of Thompson, Schellenberg, and Husain (2001), to measure mood, participants were asked to provide a global rating of mood and arousal on a scale from 1 (sad) to 7 (happy). The specific instructions were as follows:

Please use the scale provided to circle a number that corresponds to your current mood state. Any “high-energy” mood you may currently have should be placed at the high end of the scale. Or, any “low energy” mood you may currently have should be placed at the low end of the scale. For example, feelings of meditation, contemplation, or melancholy should be assigned low ratings.

Music Listening Preference Scale. Participants were asked to rate the degree to which they like classical music on a scale from 1 (Dislike Strongly) to 7 (Like Strongly).
Results
Our overall goal with this pilot study was to determine if changes in mood resulting from listening to an arousing piece of classical music might lead to changes in cognitive performance. As such, in order to determine how classical music may affect cognitive functioning, we analyzed first how mood was affected by listening to the piece. Specifically, because the impact of music on cognition may be due to changes in mood states, we compared participant performance based upon the nature of their mood change. First, a difference score was determined based on pre and post ratings of mood. This was done by subtracting the mood score pre-listening from the mood score post-listening (so that a positive score would indicate an improvement in mood). Two of the participants did not make a mood rating (one at pre and one at post), and were therefore excluded from the analysis, leaving 12 participants for analysis. Second, a median split was made to create two groups, those whose difference score was above the median and those whose difference score was below the median. This then became the basis for the analyses that are discussed next.

Distribution of Difference Scores Based Upon Mood Change
A difference score was calculated for the Math Test and the Paper Folding Test such that a positive number indicated improvement in performance (i.e., post-performance – pre-performance). Figure 1 illustrates the distribution of performance scores across test type and mood change, that is, the difference scores calculated for the Math and the Paper Folding Test (PFT).

Figure 1. Distribution of Difference Scores across Test Type and Mood Change
Influence of Mood Changes on Cognitive Tests
We analyzed the difference scores with a 2 x (2) mixed between and within repeated measures ANCOVA with mood (high versus low) as the between factor and with test type (Paper Folding Test versus Math Test) as the within participant factor. Self-reported liking of classical music was entered as a covariate. There was no main effect of mood (F < 1), or of test type F(1, 9) = 2.35, p > .05. But, on difference scores, there was a significant 2-way interaction between test type and higher versus lower mood, F(1, 9) = 6.56, p < .05 (refer to Figure 2). As illustrated in Figure 2, for participants whose mood was lowered, there was a large increase in performance on the Paper Folding Test, but little change for the Math Test. For participants whose mood was raised, there was little change in the Paper Folding Test but more change in the Math Test.

Discussion
With this pilot study we set out to determine if listening to classical music would have any changes in performance on a set of cognitive tests. Our goals were first, to identify those participants who responded and those who did not respond to listening to classical music, and second, to determine how changes in mood might influence cognitive performance. Based upon prior studies with young adults, it was hypothesized that, for those participants whose mood was elevated, there would be an increase in performance. While we were able to
determine whose performance changed based upon listening to classical music, the overall pattern of results was not as hypothesized. Specifically, counter to our expectations, while there were effects of mood changes, the largest impact was on those participants whose mood was lowered. There was a greater improvement in performance between pre and post tests on the Paper Folding Test for participants whose self-reported mood had been lowered. Although those reporting a positive mood change did better on the Math Test following listening to classical music, this change was not as great.

These data warrant additional experimentation to clarify the findings. First, a larger sample must be run in order to determine if the effects are consistent. Second, additional manipulations need to be included so as to determine the impact of listening to arousing versus depressing classical music (cf. Thompson et al. 2001). Third, a more carefully controlled setting should be used for the experiment; that is, one where participants are in a sound-proof room, free of external distractions. Specifically, the current data was collected in a large hall and with a group data collection format. As such, it is possible that this decreased the possibility of changes in performance after listening to music. In sum, the findings from this preliminary study suggest intriguing possibilities with regard to the influence of listening to classical music and cognitive functioning in the elderly.

Section 3: Research Project
The objectives of this project are to investigate relationship between listening music and cognitive function in aged population.

Traditionally the effect of music on cognition has been examined on infant or young adults. In this project, we will examine the effect of differing forms of music on cognition in elder population (>60) following the work of Thompson, Schellenberg, and Husain (2001). Then we will select individuals for testing in electroencephalography (EEG) to see correlation between responsive to the music and cortical brain functions. As such, our goal here is to not only determine the differential effect of listening on a varied set of cognitive tasks as well as on mood, but to also determine which part of the brain function is responsible to the responsiveness to the music stimuli. This result will help to select optimal music to stimulate brain function in aged population. It may also be useful to specifically stimulate certain area of the brain for treating stroke and neurodegenerative diseases.

In our preliminary study we found that the subjects responded differently to the same music. Some individuals significantly improved cognition or mood while others did not get any effect from listening music. Some of the subjects even decreased their arousal level but increased cognitive function. There may be many possible reasons for this. The first is that the differential effect of music on the cognition may depend on preference to the music. The second may be individual differences in hearing ability. Since we are planning to identify
responder and non-responder, and to test their brain function in EEG while listening music, we have to eliminate these factors before selecting individuals.

Thus in this project, we will use individual headphones and iPods to normalize the intensity of music stimuli to eliminate the individual difference in the hearing. This will allow us to perform the experiment in the different groups (e.g., control and music to increase arousal) with individual order made music stimuli. Also we will use a variety of music stimuli and repeat the test with the same subject several times to see whether they respond to the certain type of music and such responses are reproducible.

It was proved that the "familiar songs method", a method of music therapy, was effective enough to improve the arousal level. We will avoid famous songs, which experimental subjects may familiar with.

List of music to use will be:

Higher mood
- Sousa: The Invincible Eagle
- Prokofiev: Classical Symphony, Finale
- Haydn: Piano Concerto No. 4
- Mozart: Rondo from Hafner

Lower mood
- Schnitke: Cello Sonata, first movement
- Takemitsu: music from "Black Rain"
- Albeniz: Goyescas-Suite 2. Coloquio en el Reja
- J. S. Bach: St. John Passion 1st Chorus

We will conduct mood, simple math and paper folding tests described in the preliminary section before and after the music stimuli. Since we experienced difficulty conducting the research using groups containing a large number (as large as 269 subjects) of elder people as they tend to be very competitive in the behavioral test to show themselves better to the others, we decided to conduct the study with a limited number of subjects (<30). This will also limit the number of iPod we have to use in the study to 30. We will repeat the experiments to increase total number of subjects participated in the study to 200, which will give statistical power. As we mentioned above, we will also repeat at least 3 times with the same individuals with different music stimuli.

After we confirm responders and non-responders above mentioned normalized experimental condition, we will conduct the EEG with the selected population. In the EEG measurement, The frequency analysis of the electroencephalography will be used to investigate whether crests will be observed in the alpha wave region before the music program, and if the crests will be lowered or shifted to
the β wave region before and after listening music. The result will be analyze with the arousal and cognitive function levels.

This study will extend the research on music and cognition by: (1) examining effects on differing age groups; and (2) assessing any effects on differing types of cognitive tests. By varying the type of music (one hypothesized to increase arousal and mood and the other hypothesized to decrease arousal and mood), we will better understand the potential influence of music on varied forms of cognition and across differing age groups.

Plan of Work

☐ Task 1 – Stimuli Finalization. Although we will use similar cognitive measures for this research, because there will be multiple measurement times, we will need to increase the numbers of test items for the assessment. As such, our first task involves the acquisition and/or development of the spatial reasoning and mathematics test items.

☐ Task 2 – IRB Approval. Our second task consists of submitting the appropriate IRB application for this experiment.

☐ Task 3 – Recruitment Campaign. Given the challenge associated with recruiting a sample of sufficient enough size, our third task involves identifying a set of locations within the Orlando area (e.g., retirement communities) from which to gain access to participants. From these we will advertise the purpose of our study and manage the logistics for the research to be conducted at the differing settings (e.g., selecting the appropriate room for the study).

☐ Task 4 – Data Collection. Our third task involves the data collection portion of the research. Given that the design will require multiple sessions, this will take place over several weeks.

☐ Task 5 – Data Coding and Analysis. This task involves the coding of the raw data and the actual analysis.

☐ Task 6 – Selection and Recruitment of EEG Participants. This task involves identifying and recruiting the top and bottom 10% of responders for the comparison analysis using EEG.

☐ Task 7 – EEG Data Collection. This task involves the EEG data collection component to examine whether there are responder changes occurring in the alpha wave and β wave regions.

☐ Task 8 – EEG Data Analysis. This task involves the analysis of the EEG data.

☐ Task 9 – Final Report Write-up. This task involves final report preparation based upon the data collections.

<table>
<thead>
<tr>
<th>Plan of Work Tasking</th>
<th>End Date (Months from Start)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Task 1 – Stimuli Finalization</td>
<td></td>
</tr>
<tr>
<td>Task 2 – IRB Approval</td>
<td></td>
</tr>
<tr>
<td>Task 3 – Recruitment Campaign</td>
<td></td>
</tr>
<tr>
<td>Task 4 – Data Collection</td>
<td></td>
</tr>
<tr>
<td>Task 5 – Data Coding and Analysis</td>
<td></td>
</tr>
<tr>
<td>Task 6 – Selection and Recruitment of EEG Participants</td>
<td></td>
</tr>
<tr>
<td>Task 7 – EEG Data Collection</td>
<td></td>
</tr>
<tr>
<td>Task 8 – EEG Data Analysis</td>
<td></td>
</tr>
<tr>
<td>Task 9 – Final Report Write-up</td>
<td></td>
</tr>
</tbody>
</table>
**Section 4: Budget**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate students</td>
<td>$3,000 ($1,500x2)</td>
</tr>
<tr>
<td>iPod</td>
<td>$1,617 ($49x33)</td>
</tr>
<tr>
<td>Compensation to the participants</td>
<td>$4,000 ($20x200)</td>
</tr>
<tr>
<td>EEG consumables</td>
<td>$1,500</td>
</tr>
<tr>
<td>Pencil and Paper for test</td>
<td>$800</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$10,917</strong></td>
</tr>
</tbody>
</table>
Section 5: Future Plans

Our long-range goal is to identify suitable music to prevent or treat memory impairment in aging. Thus, after we identify music stimuli, which improve cognition and arousal in general population, we will conduct clinical research as collaborations with Florida Hospital and the Memory Disorder Clinic at ORMC. We will apply a National Institute of Health grant for these clinical research projects. We will also apply The international Foundation for Music Research grant since we are now have enough preliminary data to support our hypothesis. in this grant we will expand the research to visualize stem cell population in the live brain using functional MRI, which technique recently reported by other group. This allows us to prove another hypothesis that listening music increases neural stem cell population.

Section 6: Vitas (attached)

Section 7: Appendix (optional)
Ayako Yonetani, DMA
Violinist
Professor

4855 Aguiia Place
Orlando, FL 32826-6512
Tel/Fax (407) 823-6190 (W)
yonetani@mail.ucf.edu

CNH 107
Music Department
University of Central Florida

Education
D.M.A., Juilliard School 1993
M.M., Juilliard School 1987
B.M., Juilliard School 1986
• Major Teachers
  The late Miss Dorothy DeLay 1983-1993
  Mr. Hyo Kang 1983-1990

Teaching Experience
Professor of Violin/Viola 2007-Present
University of Central Florida
Associate Professor of Violin/Viola 1998-2007
University of Central Florida
Assistant Professor of Violin/Viola 1993-1998
University of Central Florida
Jay and Doris Christopher endowed Chair of Strings 2003-Present
Lutheran Summer Music Academy and Festival

Performance Experience
Solo Recitals
"Ayako at Polasek" Concert Series, Winter Park, FL 2005-Present
Recital at Tsuda College, Tokyo Japan 2006
Penn State University, PA 2005
University of Houston, TX 2005
Bunka Kaikan, Alti Hall, Tokyo and Kyoto, *reviewed 2002
Dame Myra Hess Concert Series in Chicago *broadcast 2001

Solo Concerti with Orchestra
Dr. Stella Sung Double Concerto 2005
"Shabyt" competition Gala Concert, Astana City, Kazakhstan
Vivaldi "Four Seasons" 2003
Orlando Philharmonic Orchestra, Set of 3 concerts, "broadcast 2003
Brandenburg Concerto 2003
Kioi Sinfonietta Tokyo, Tokyo
Sibelius Concerto 2001
Charlotte Symphony Orchestra, *reviewed
Mendelssohn Concerto 2001
Ostrava Music Festival, Czech Republic
Zilina Spring Music Festival, Slovak Republic

Chamber Music Experience
Orlando Chamber Soloists 2003-Present
Omega String Quartet 2003-Present
Kioi Sinfonietta Tokyo 1994-Present
**Publications**

**Book**


<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Miss Dorothy DeLay Memorial&quot;</td>
<td>2002</td>
</tr>
<tr>
<td>&quot;My Slovak/Czech Trip&quot;</td>
<td>2001</td>
</tr>
<tr>
<td>&quot;The 50th Anniversary of the Aspen Music Festival and School&quot;</td>
<td>1999</td>
</tr>
</tbody>
</table>

**Article**

<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;My Slovak/Czech Trip&quot;</td>
<td>2001</td>
</tr>
<tr>
<td>&quot;The 50th Anniversary of the Aspen Music Festival and School&quot;</td>
<td>1999</td>
</tr>
</tbody>
</table>

**Discography**

<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;My Favourite&quot; Ayako Yonetani</td>
<td>2008</td>
</tr>
<tr>
<td>Bruch Violin concerto, Bach Chaconne etc.</td>
<td>2005</td>
</tr>
<tr>
<td>Prokofiev: Kioi Sinfonietta Tokyo. Symphony No. 1 “Classical Symphony” etc</td>
<td>2004</td>
</tr>
<tr>
<td>Ayako Yonetani and the Slovak State Philharmonic Mendelssohn and Tchaikovsky violin concerto Milky Way Classics, 8253465527</td>
<td>2002</td>
</tr>
<tr>
<td>Kioi Sinfonietta Tokyo December Live Concert Maestro &amp; solo cellist, Mario Brunello, Victor, Japan VICC-60394</td>
<td>2001</td>
</tr>
<tr>
<td>Takernitsu-How slow the wind Kioi Sinfonietta Tokyo Christian Lindberg, solo trombone, BIS SACD 1078</td>
<td>2000</td>
</tr>
</tbody>
</table>

**Honors and Awards**

<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elected an honorary Henry Crown Fellow at the Aspen Institute</td>
<td>2006</td>
</tr>
<tr>
<td>Selected as an official Artist for Florida State Touring Program</td>
<td>2006-2008</td>
</tr>
<tr>
<td>Research Incentive Award</td>
<td>2003</td>
</tr>
<tr>
<td>Excellence in Undergraduate Teaching Award</td>
<td>1997</td>
</tr>
<tr>
<td>University of Central Florida</td>
<td></td>
</tr>
<tr>
<td>State of Florida Artist Enhancement Grant</td>
<td>2007-2008</td>
</tr>
<tr>
<td>CAH Interdisciplinary Research Award</td>
<td>2006, 2007</td>
</tr>
<tr>
<td>United Arts Professional Development Grant for Individual Artist</td>
<td>2007</td>
</tr>
</tbody>
</table>
### BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2. Follow this format for each person. DO NOT EXCEED FOUR PAGES.

**NAME**  
Sugaya, Kiminobu, Ph.D.

<table>
<thead>
<tr>
<th>erA COMMONS USER NAME</th>
<th>POSITION TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ksugaya</td>
<td>Professor of Molecular Biology</td>
</tr>
</tbody>
</table>

#### EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science University of Tokyo, Tokyo, JAPAN</td>
<td>BS</td>
<td>1979-1983</td>
<td>Pharmacology</td>
</tr>
<tr>
<td>Science University of Tokyo, Tokyo, JAPAN</td>
<td>MS</td>
<td>1983-1985</td>
<td>Pharmacology</td>
</tr>
<tr>
<td>Science University of Tokyo, Tokyo, JAPAN</td>
<td>PhD</td>
<td>1985-1988</td>
<td>Pharmacology</td>
</tr>
<tr>
<td>Southern Illinois University, Springfield, IL</td>
<td>Post-doc</td>
<td>1988-1989</td>
<td>Neurochemistry</td>
</tr>
<tr>
<td>Mayo Clinic, Jacksonville, FL, USA</td>
<td>Post-doc</td>
<td>1992-1994</td>
<td>Molecular Biology</td>
</tr>
</tbody>
</table>

#### A. Positions

- **2007-2004** Associate Professor with Tenure, Burnett School of Biomedical Sciences, College of Medicine, University of Central Florida, Orlando, FL
- **2002-2004** Associate Professor with Tenure, Department of Physiology and Biophysics, UIC, Chicago, IL
- **2003-2004** Adjunct Professor of Ophthalmology, Department of Ophthalmology, UIC, Chicago, IL
- **2003-2004** Adjunct Professor of Bioengineering, Department of Bioengineering, UIC, Chicago, IL
- **2001-2002** Adjunct Assistant Professor of Ophthalmology, Department of Ophthalmology, UIC, Chicago, IL
- **2000-2002** Assistant Professor, Department of Ophthalmology, University of Illinois at Chicago, Chicago, IL
- **1999-2002** Assistant Professor, Department of Physiology and Biophysics, UIC, Chicago, IL
- **1997-1999** Research Assistant Professor, Department of Psychiatry, Univ. of Illinois at Chicago, Chicago, IL
- **1997** Assistant Professor, Pharmacology, Mayo Clinic Jacksonville, Jacksonville, FL
- **1994-1997** Associate Consultant, Neuropharmacology, Mayo Clinic Jacksonville, Jacksonville, FL
- **1993-1994** Research Associate, Neuropharmacology, Mayo Clinic Jacksonville, Jacksonville, FL
- **1992-1993** Research Fellow, Neuropharmacology, Mayo Clinic Jacksonville, Jacksonville, FL
- **1989-1992** Full-time Lecturer, Division of Aging and Intractable Diseases, Research Institute for Biosciences, Science University of Tokyo, Noda, Chiba, Japan

#### PROFESSIONAL SOCIETIES:

- Society for Neuroscience
- American Association for the Advancement of Science
- The Association for Research in Vision and Ophthalmology
- Sigma Xi

#### MANUSCRIPT REVIEWER

- The Japanese Journal of Pharmacology
- Journal of Neurochemistry
- Neurochemistry International
- Restorative Neurology and Neuroscience
- Biochemical Pharmacology
- Experimental Neurology
- Drugs, Cellular and Molecular Life Sciences
- Journal Informatics
- Neuralmage
- Cytology
- Neurobiology of Aging
- Neoplasia
- PNAS

#### GRANT REVIEWER

- Alzheimer Association Research Grant
- Medical Research Council (England)
- NIH acid hoc and BSCT Member
- Guy’s & St Thomas’ Charitable Foundation research grant (England)
B. Publications (selected from 8% publications)
STEPHEN M. FIORE - BIOGRAPHICAL SKETCH

Professional Preparation

<table>
<thead>
<tr>
<th>Institution</th>
<th>Major</th>
<th>Degree and Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montgomery College</td>
<td>Business Administration</td>
<td>A.A. 1986</td>
</tr>
<tr>
<td>University of Maryland</td>
<td>Marketing</td>
<td>B.S. 1988</td>
</tr>
<tr>
<td>University of Maryland</td>
<td>Psychology</td>
<td>B.A. 1991</td>
</tr>
<tr>
<td>University of Pittsburgh</td>
<td>Cognitive Psychology</td>
<td>M.S. 1994</td>
</tr>
<tr>
<td>University of Pittsburgh</td>
<td>Cognitive Psychology</td>
<td>Ph.D. 2000</td>
</tr>
</tbody>
</table>

Appointments

- 2005-present: Assistant Professor, Cognitive Sciences Program, Department of Philosophy, University of Central Florida, University of Central Florida, Orlando, FL
- 2007-present: Director, Cognitive Sciences Laboratory, Institute for Simulation and Training, University of Central Florida, Orlando, FL
- 2002-2007: Director, Consortium for Research in Adaptive Distributed Learning Environments, Institute for Simulation and Training, University of Central Florida, Orlando, FL
- 1998-2002: Research Scientist, Team Performance Laboratory, Department of Psychology, University of Central Florida, Orlando, FL
- 1992-1998: Lab Coordinator, Learning Research and Development Center, University of Pittsburgh, Pittsburgh, PA

Background/General Experience

Dr. Fiore has over 15 years of experience in cognitive science research, conducting a mix of basic and applied studies in learning, memory, and problem solving in individuals and in teams. He is faculty with the Cognitive Science program in the Department of Philosophy and the Institute for Simulation and Training. Dr. Fiore's responsibilities include devising and creating both large and small scale research programs as well as implementing laboratory studies in human cognition. Since 1999, Dr. Fiore has been PI or Co-PI on over $6 million in federally funded research. He currently is PI on a grant from the Office of Naval research investigating problem solving in teams and PI on a grant from the Department of Homeland Security to understand training and the development of perceptual expertise. Dr. Fiore is Co-PI on a grant from the National Science Foundation to investigate the use of simulations as an aid to decision making in environmental economics. He is also a Co-PI on an Office of Naval Research grant involving the study of collaboration in complex networked environments. He has produced over 100 scholarly publications including edited volumes on Distance Learning and on Team Cognition.

Selected Publications

Books - Edited Volumes

Journal Special Issues Co-edited

*Current Student or Former Student Co-authors*
Peer-reviewed Journals – Selected Articles (last 5 years)


Selected Book Chapters (last 2 years)


*Current Student or Former Student Co-authors*
Jeffrey S. Bedwell  
Curriculum Vita (2 pages)

Department of Psychology  
University of Central Florida  
P.O. Box 161390  
Orlando, FL  32816-1390  
Work Phone: (407) 823-5858  
E-mail: jbedwell@mail.ucf.edu

Educational History

2004  
Ph.D., Psychology (Clinical)  
University of Georgia, Athens, GA

2001  
M.S., Psychology  
University of Georgia, Athens, GA

1995  
B.S., Psychology  
James Madison University, Harrisonburg, VA

Professional Experience

2004 - present  
Assistant Professor, Clinical Ph.D. Program, Department of Psychology, University of Central Florida, Orlando, FL

2003  
Visiting Fellow, Advanced Training Institute in Functional Magnetic Resonance (fMRI) Training, American Psychological Association, Boston, MA

2002-2003  
Pre-doctoral Clinical Psychology Internship, Medical University of South Carolina/Dept. of Veterans Affairs Consortium, Charleston, SC

1996-1999  
Research Assistant (full-time, funded), Childhood-Onset Schizophrenia Project, Child Psychiatry Branch, National Institute of Mental Health, Bethesda, MD

1996  
Research Assistant (full-time, funded), American Academy of Physicians Assistants, Alexandria, VA

Licensure

2006 - present  
Psychologist (Clinical), Florida License Number PY7264

Awards / Honors

2007  
Invited research participant (funded) in the 2007 Credibility Assessment Research Summit organized by the U.S. Department of Defense – Vienna, VA.

2003-2004  
University-Wide Dissertation Completion Award, School of Graduate Studies, University of Georgia, Athens, GA

2003  
Winner, Research Paper Competition (based on external reviews), Clinical Internship, Medical University of South Carolina/Dept. of Veterans Affairs, Charleston, SC

2003  
Selected as Visiting Fellow for Advanced Training Institute in Functional Magnetic Resonance Imaging, American Psychological Association, Boston, MA

2002  
Henry E. Adams Memorial Research Award (based on external reviews), Clinical Psychology Program, University of Georgia, Athens, Georgia

2002  
Herbert Zimmer Award, Clinical Psychology Program, University of Georgia, Athens, Georgia

2001  
Manfred Meier Neuropsychology Scholarship, National award for excellence in neuropsychological research, American Psychological Foundation, American Psychological Association

Teaching Experience

Neuropsychology, Undergraduate
Abnormal Psychology, Undergraduate
Cognitive-Behavioral Therapy, Graduate
Clinical Practicum, Graduate
General Background

Dr. Jeffrey Bedwell joined UCF in 2004 after completing his doctoral degree in Clinical Psychology at the University of Georgia, with a predoctoral clinical internship at the Medical University of South Carolina/Dept. of Veterans Affairs Consortium in Charleston, SC. Prior to his graduate studies, Dr. Bedwell received his B.S. in Psychology from James Madison University and then worked for several years in the Child Psychiatry Branch of the National Institutes of Mental Health conducting research on childhood-onset schizophrenia. Dr. Bedwell’s research lab, the Clinical Cognitive Neuroscience Laboratory, has a primary focus on neurobiological and genetic components of schizophrenia. Additional research currently conducted in the laboratory includes cognitive/neurobiological correlates of social anxiety, chronic stress, and deception. For more information on Dr. Bedwell’s research, please see the lab website at: Clinical Cognitive Neuroscience Laboratory (CCNL).

Recent Publications (selected from 32 publications)


Recent Presentations (selected from 42 presentations)


Professional Society Activities

Society of Biological Psychiatry – Full Member
Society for Research in Psychopathology – Full Member
Schizophrenia International Research Society – Full Member
American Psychological Association – Full Member