



Connecticut Institute for the Brain and Cognitive Sciences



Annual Report, Year 2 2016-17

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EXECUTIVE SUMMARY (and main expenditure):

- 13 **seed grants** awarded (8 applications pending), with PIs across 12 departments: \$145,765 (2 grants joint with InCHIP).
- 23 **Graduate fellowships** awarded, across 10 departments: \$109,000
- 12 **Undergraduate fellowships** awarded, across 6 departments: \$24,000
- 16 **External grant applications** (see Section 5) with IBACS-supported pilot data or equivalent, totaling \$19.6M. \$2.9M awarded so far. \$13M+ *pending* (excludes graduate fellowship applications through the Graduate Fellowship Program)
- **Laboratory support** (through direct funding, admin support, or funded GAs): *Brain Imaging Research Center, UConn K.I.D.S.; UConn Logic Group; Murine Behavioral Neurogenetics Facility; Cognitive Science Shared Electrophysiology labs.*
- **Workshop support:** 8 sponsored workshops/meetings/programs + IBACS 2-day annual *Meet-and-Speak*
- **Space renovation:** graduate workspace in Arjona: \$25,000

2. INSTITUTE MISSION

The mission of the **Connecticut Institute for the Brain and Cognitive Sciences** (CT IBACS) is to serve as both a beacon and incubator for research across the brain and cognitive sciences at UConn and beyond; promoting and supporting the interdisciplinary science of the mind and its realization in biological and artificial systems. It will enable new research and educational opportunities for graduate students, postdoctoral researchers, and faculty to extend their intellectual reach beyond traditional disciplinary boundaries, as well as enabling undergraduates to receive laboratory-based training in neuroscientific, behavioral, and theoretical research in the brain and cognitive sciences. It aims to provide the physical, financial, administrative, technical, intellectual, and educational infrastructure to enable UConn's extensive but distributed neuroscience and cognitive science community to realize its full potential for disciplinary and interdisciplinary innovation in the brain and cognitive sciences.

The Institute was founded July 1st 2015, as a part of the University's Academic Plan.

3. GOVERNANCE

The Institute is managed by a **Director** (Altmann, *Psych Sciences*) and two **Associate Directors** (Magnuson, *Psych Sciences*; LoTurco, *PNB*). They meet with an **Executive Committee** of 10 other faculty drawn from 7 different departments (including Neuroscience at UConn Health, Farmington). The executive meets in person three times per year, although day-to-day issues are brought to their attention, and advice sought, via ad-hoc emails throughout the year. The Director and Associate Directors meet each week during the semesters, and occasionally during the summer break.

In 2016/17 a **UConn-internal Advisory Board** was constituted (advising on shorter- and longer-term issues of strategic importance, in respect of both Institute-internal matters and issues that may impact externally on the Institute). This meets twice a year. An **External Advisory Board** will be constituted in 2017/18 (to provide different perspectives on the Institute's mission, activities, and successes, and to advise on best practice based on their experience at their own Institutes, Centers, and other organizations). We delayed initiating these advisory boards in order to focus on setting up the Institute according to the transition plan formulated with help from the Provost's office, the VPR's office, CLAS, and the committee constituted approximately four years ago to oversee the setting up of an Institute for the Brain and Cognitive Sciences (which transitioned into the current Executive Committee). Throughout the year we have continued to solicit and receive advice from CLAS, the Offices of the Provost and the Vice President for Research, as well as the heads of the various departments we interact with (with particular support from Psychological Sciences, which also provides administrative and financial support).

4. INSTITUTE ACTIVITIES 2016/17:

Facts and Figures:

1. **Seed grants:** We had two calls for seed grants (November and May) and received 28 applications (4 to a joint IBACS/InCHIP initiative) of which **13 have so far been funded** (*two of these joint with InCHIP. 27 PIs across 12 UConn departments*). Eight more of these 28 applications are under review at the time of writing. Applications were reviewed by one of two panels (depending on topic). No member of a panel was a PI or co-PI on any application in that round. Like last year, approximately half the dollar amount was awarded to more "cognitive" or behavioral grants, and

the remainder to bench or animal neuroscience grants (including genomics). Three of the grants directly support research at the Behavioral Imaging Research Center (BIRC). All awards are described on the IBACS website (ibacs.uconn.edu/research/). *A condition of award of a seed grant is that, in the event of a successful outcome (e.g. data suitable for publication or inclusion as pilot data in a grant) the PI will submit an application for external funding.* We track and follow-up each funded grant to ensure this condition is met. **Total amount awarded: \$145,765** (an additional \$100,000+ still to be awarded to applications submitted May).

2. **Graduate Fellowships:** These pay up to \$5,000 in summer funding to graduate students. *A condition of award is that students apply for a pre- or post-doctoral award (e.g. NRSA or GRF) in the Fall.* To this end, recipients take a 3-day grant-writing workshop hosted by the Institute. The Summer 2016 workshop is being repeated Summer 2017. For non-US citizens, their advisor had to commit to writing an application for external funding. We shall follow up on each fellowship (see below for 2016 metrics). The IGERT on Language Plasticity had funds for summer payments and we joined forces to enable a larger number of total fellowships. This year (Summer 2017), we funded **23 students, at a cost of \$95,000**. Funding decisions were made by a committee comprising the Director and Associate Directors (COIs were avoided by ensuring that no advisor scored their own student, and conflicts were registered and explicitly considered by non-conflicted members).
3. **Undergraduate Fellowships.** We introduced an undergraduate fellowship scheme, managed by John Salamone in conjunction with the Office of Undergraduate Research. The fellowships allow a student to work in an Institute affiliate's lab and provide up to \$1,000 research expenses for semester fellowships, and a combination of \$1,500 research expenses and \$3,500 stipend for summer fellowships. We funded 9 semester and 3 summer fellowships in 2016/17 at a **total cost of \$24,000**.
4. **IBRAiN Program:** In January 2017 we initiated discussion of a Research Assistantship scheme paying graduate students a stipend for 10 hours' assistance per week in BIRC ("IBRAiN" = "IBACS-BIRC Research Assistantships in Neuroimaging"). Many PIs intending to work at BIRC require assistance with advanced specialized knowledge currently lacking in their labs (basic knowledge is often sufficient to conceive of appropriate imaging studies, but is not sufficient to actually run the study and analyze the data); this IBRAiN scheme will help develop that knowledge for each PI and their research group. Five GAs have been selected by a panel, organized by BIRC, taking into account BIRC priorities as well as GAs' previous experience and their advisors' aspirations regarding research in BIRC. Each GA and their advisor are receiving a BIRC seed grant in the form of scan time, and *a condition of this IBRAiN seed grant is that, subject to the pilot data they collect, they apply for external funding to continue the research.* GAs will only devote a part of their time to their corresponding seed grant – the majority of their time will be spent helping other PIs. The five GAs will start in the Fall of 2017 and continue through until Summer 2018. They have also been awarded fellowships for this summer (2017), worth \$5,000 each, and they will have the opportunity to be trained on advanced neuroimaging methods over the summer prior to working at BIRC helping the PIs with neuroimaging (fMRI and advanced EEG) projects to initiate, execute, and complete them. The total cost of the program is approximately **\$105,000**. The need for this level of support, at this time, was recognized by both the BIRC Steering Committee and the IBACS Executive Committee.
5. **Other Research Support during the past year (July 2016 – June 2017):**
 - a. **Murine Behavioral Neurogenetics Facility (MBNF):** MBNF is a Tier 2 facility. We funded 30 hours per week (3 GAs in all) to support Institute-funded and affiliated research with mouse models (linking cognitive behavior to neuroscience and genetics).
 - b. **Cognitive Science Shared Electrophysiology Labs (CSSERL):** Lab manager (20 GA hours per week). CSSERL supports the electrophysiological (EEG) research of faculty in SLHS, Linguistics,

- and Psychological Sciences. The lab manager supports Institute-funded and affiliated research at CSSERL as well as at BIRC.
- c. **Brain Imaging Research Center (BIRC).** (1) Combined fMRI/EEG GA (10 hours per week). Following the purchase last year of the upgraded high definition EEG system (supported by CLAS) we supported this GA position. The GA has trained several new users of the dEEG system as well as helped develop the protocols for in-scanner EEG. (2) Dr. Gitte Joergensen (the Director's lab manager / postdoc) spent a minimum of 12 hours per week on BIRC-related activities during the year, developing, maintaining, and helping write scripts for, the in-scanner eye-tracking system. She also helped with EEG and worked with Elisa Medeiros (MR Tech) on development and maintenance of other fMRI-based projects. She was closely involved in discussions of the IBRAiN program.
 - d. **UConn Logic Group** (\$5,200). To support colloquia, visits, and other activities of the Logic Group – a group of logicians across the departments of Mathematics, Philosophy, and Linguistics.
 - e. **Expression, Communication, and the Origins of Meaning (ECOM) Research Group** (\$5,000). To support general group activities including organization of a workshop and an international conference.
 - f. **UConn K.I.D.S.** This is jointly supported by Psychological Sciences and CLAS and serves to recruit child participants in studies of both typical and atypical development (e.g. autism, SLI, etc). This year, IBACS supported UConn K.I.D.S. through training of the new assistant, as well as continued support for the UConn server.
6. **Workshop support.** The Institute supported 7 workshops/conferences: (i) Robust Statistics (ii) Speech Synthesis with STRAIGHT Software (iii) IGERT/NBL J term (iv) LangFest (v) InChIP Lecture Series (vi) Neuromusic Workshop. (vii) Grant Writing Workshop, and (viii) miscellaneous colloquium support. **Total outlay: \$7,200**
 7. **Annual "Meet-and-Speak".** We held a 2-day meeting with eighteen 15-min faculty speakers from both Storrs and UConn Health (all recipients of IBACS seed grants), as well as eighteen 5-min presentations from Graduate Students (all beneficiaries of, or associated with, those seed grants). We anticipate a similar meeting in 2018 with, in addition, an internal speaker on the first evening, and an invited external speaker on the second evening.
 8. **IBACS External Application Review.** This internal review process has been organized by a small interdisciplinary group led by Jim Magnuson, and tasked with helping UConn investigators develop high quality grant proposals by offering a mechanism for "mock review" of in-development proposals, and facilitating mentoring in grant writing. The infrastructure was set up during early 2017 and one external grant application is already being mentored through the process. Further details at: <http://ibacs.uconn.edu/ear>
 9. **Outreach and related activities.**
The Institute published its first Research Digest edited by one of our graduate students (Oliver Sawi). This is similar to a "glossy brochure" and was sent in electronic form to 188 members of the state legislature (as approved by CLAS and University Governmental relations). We received much positive feedback (hardcopies were requested – we printed 300 and we only have a few left). The first issue highlighted UConn's work on language and its disorders. The second issue is currently being finalized, focusing on bilingualism and sign language. It will be circulated in early Fall. The 2018 issue will likely focus on work across the neurosciences at both Storrs and UCHC.
 10. **Affiliate membership.** Excluding the Director, 2 Associate Directors, and 10 Executive Committee members, we have 71 **affiliated faculty** (up from 47 last year) and 69 **affiliated graduate students** (up from 32 last year) from across 22 UConn departments. All are listed on the Institute website (photograph, research description). Affiliation is dependent on demonstrating research expertise relevant to the research mission of the Institute. We anticipate growing this number each year.

11. **Administrative support.** After our first year it became apparent that a half-time administrative support position was insufficient. Psychological Sciences offered to contribute one quarter-time towards a full-time position, and the Institute increased its contribution to three-quarters. Since November 2016 we have therefore had a full-time assistant – Brandy Ciraldo. This position also provides support to the Cognitive Science undergraduate program (admin support and website management) as well as some support to BIRC (collection of metrics).

5. METRICS FOR EVALUATING INSTITUTE IMPACT: December 1st 2015 – March 31st 2017

The first Institute funds were disbursed in December 2015, and we have taken as our primary reporting period for grant activity **12/1/2015-03/31/2017** (16 months).

The Institute's impact is twofold: in respect of the research ethos it is stimulating and in respect of more tangible outputs such as grant applications and publications. One of the core missions of the Institute is to foster new collaborative research initiatives, through facilitating dialog across traditional disciplinary boundaries. This is accomplished through activities such as the Meet-and-Speak, as well as through support of research groups that are themselves fostering such cross-disciplinary dialog. This contribution of the Institute to the University's research ethos is critical, and a primary motivation for the founding and continued operation of the Institute. However, because it is less quantifiable than the Institute's contribution to grant activity and publication and other outputs, we focus in this section on the latter, detailing metrics concerning grant activity, and publications.

1. **Grant Activity:** Here, we report on grant applications submitted externally by recipients of IBACS seed grants, as well as by the broader Brain and Cognitive Science community as represented by IBACS affiliates.

HEADLINE SUMMARY – EXTERNAL GRANT APPLICATIONS:

- IBACS-supported grant applications were more successful than grant applications not supported by IBACS. This was true both for the same PIs (comparing their IBACS-supported applications against their non-supported applications), as well as comparing PIs receiving IBACS support with PIs not receiving such support.
- PIs receiving IBACS support were proportionally more successful relative to themselves two years earlier than were PIs not receiving IBACS support.
- **IBACS-supported grant applications that were successful brought in more money in indirects (\$812K, with \$4M pending) than the Institute paid out across all its activities (not just seed grants) in the same reporting period (\$726K).**

DETAILS:

- a. We wrote to all 21 recipients of seed research grants (for this extended reporting period, excluding recipients of the two recent IBACS/InCHIP grants) and asked whether they had submitted any **grants externally in this period which had been directly supported by IBACS seed funding** (that is, grants whose *applications* made reference to data collected as a part of an IBACS seed grant). We asked for total amount requested, and total indirects that would accrue to UConn. We also asked whether any such grant applications had been successful.
 - Directly supported grants **applied for**: 17 grants totaling \$19.6M (indirects \$6.5M)
 - Directly supported grants **awarded**: 4 grants totaling \$2.9M (indirects \$812K)
 - Directly supported grants still **pending**: 9+ grants totaling approx. \$13.1M (indirects \$4M)
 - **\$ hit rate** (dollars awarded as percent of dollars applied for): **15%**
 - grant hit rate (# grants awarded as percent of # grants applied for): **24%**

Note 1: Hit rates will likely increase: some proportion of pending grants will likely be awarded

Note 2: The **total** Institute expenditure in this same period, for comparison against indirects awarded: \$726K

- b. We next compare grant success when supported by IBACS with grant success when not supported by IBACS, but across the same individuals (i.e. controlling for grant writing skill): In collaboration with the CLAS grants and contracts office, and the VPR's office at UCHC, we identified **all** grant applications, both supported and not supported by IBACS, that had been submitted externally by these same 21 individuals over this same period.

- Total grants **applied for**: 48 grants totaling \$42.9M (indirects \$11.8M)
- Total grants **awarded**: 9 grants totaling \$3.7M (indirects \$1.1M)
- Total grants still **pending**: 27 grants totaling \$31.8M (indirects \$8.8M)
- **\$ hit rate** (dollars awarded as percent of dollars applied for): **9%**
- grant hit rate (# grants awarded as percent of # grants applied for): 19%

These data, in comparison with those in (a), suggest that the grants that were supported by IBACS were more successful than those that were not, even within the same individual.

Note: Hit rates will likely increase: some proportion of pending grants will likely be awarded

- c. We next compare grant success in individuals supported by IBACS seed grants with grant success in the IBACS community more generally – i.e. from those IBACS affiliates who had not received IBACS seed funding. 26 such affiliates were identified as having made external grant applications in this same period. Their equivalent figures are:

- Total grants **applied for**: 54 grants totaling \$35.9M (indirects \$10.6M)
- Total grants **awarded**: 9 grants totaling \$1.3M (indirects \$248K)
- Total grants still **pending**: 35 grants totaling \$25.4M (indirects \$7.9M)
- **\$ hit rate** (dollars awarded as percent of dollars applied for): **4%**
- grant hit rate (# grants awarded as percent of # grants applied for): 17%

These data, in comparison with those in (b), suggest that although grant hit rates are comparable (17% vs. 19%), individuals who receive IBACS seed grants are generally more successful at obtaining external funding than are those in the community who do not receive IBACS seed grants.

Note: Hit rates will likely increase: some proportion of pending grants will likely be awarded

- d. We repeated (b) and (c) for an equivalent 16 month period from **12/1/2013 to 03/31/2015**. We tracked individuals who had been recipients of seed grants in the current period and compared their current period metrics against their prior period metrics, and we tracked affiliates who had not been recipients of seed grants and again compared their metrics in the current period with metrics in the preceding period. We could not compare against the previous period for UCHC affiliates because of different reporting structure at UCHC.

IBACS seed grant recipients: Of the 21 who received IBACS seed funds, 17 had applied for external grant funding in the current period, and 14 of these had also applied for external

funding in the prior period. We report figures for just these 14 PIs for whom we have data in the current *and* prior period: These 14 PIs, in this prior reporting period, had **applied for 38 grants worth \$19.9M** (down from \$33M for the current period, across 36 grant applications), and were **awarded 2 grants worth \$487K** with a 2.5% dollar hit rate (in the current period these 14 were awarded 6 grants worth \$2.9M with an 8% total hit rate, which includes grants that had not been supported by IBACS, and a 15% hit rate for just IBACS-supported grants) – they applied for 1.7 times more money in the current period than they had applied for in the previous period and were awarded 5 times more than they were awarded in the previous period; almost all of these (90%) were IBACS-supported.

Other IBACS affiliates: 26 affiliates had applied for external grant funding in the current period, and 14 of these had also applied for external funding in the prior period. We report figures for just these 14 PIs for whom we have data in the current *and* prior period: These 14 PIs had **applied for 33 grants worth \$26.7M** in the prior reporting period (down from \$32M for the current period, across 39 grant applications), and were **awarded 3 grants worth \$181K** with a 0.7% dollar hit rate (in the current period these 14 were awarded 2 grants worth \$479K with a 1.5% hit rate) – they applied for 1.2 times more money in the current period than they had applied for in the previous period and were awarded 2.6 times more than they were awarded in the previous period.

These data provide a baseline: For those individuals in the community who were not funded by IBACS, their “dollar hit rate” was 2.6 times more in the current reporting period than in the prior reporting period. For individuals who were funded by IBACS, their hit rate was 5 times more than in the prior reporting period.

Note: Hit rates for the current period will increase: some proportion of pending grants will be awarded. There are no pending grants from the prior period, so those hit rates will remain constant.

These figures suggest, overall, that even though IBACS tends to fund the more successful individuals, within these more successful individuals, their IBACS-funded projects are more successful than their non IBACS-funded projects.

Spreadsheets from which these numbers were derived are available from the Director on request, and were generated with help from Gabrielle Fish, CLAS Grants and Contracts.

It should be noted that these figures are only for PIs who received seed grant funding. There are a (small) number of external grant applications pending that were submitted by PIs based on work that their students carried out while on IBACS Graduate Summer Fellowships. We have not included those grant applications here. Nor have we included extramural graduate fellowship applications (these attract small indirects). In the Year 3 Annual Report we shall include these additional metrics.

2. **Publications and other output:** In Appendix 4 we list publications by Institute affiliates in two categories – *Directly* supported and *indirectly* supported. Institute affiliates were given the following guidance: if the Institute had funded work that was described or referred to in the published work, or had funded work that led, one way or another, to the published work, then that constituted “direct support”. There were 12 such publications identified **for the period 7/1/16–6/30/17**, and 20 conference presentations. If the work had been “inspired” by IBACS-

related activities or the ethos that has been generated since the inception of the Institute, then that would constitute “indirect support” (53 manuscripts and 4 conference presentations). For various reasons (including the proximity to the end of the semester when we requested this information) not all affiliates (and specifically, not all those who were funded through the seed grant or fellowship mechanisms) responded in time to be included in this report.

Note: We discovered that respondents were (with hindsight, unsurprisingly) confused by the reporting period (e.g. whether a manuscript had been published before or after 7/1/16, and the fact that we were requesting information on a period that would end 3 months after the information was requested). In the next Annual Report (2017/2018) we shall collect data on outputs published/submitted/presented in both 2017 and 2018, and in the report for 2018/2019 outputs published/submitted/presented in both 2018 and 2019. This two-year ‘window’ is a common method to ensure that, across successive years, all appropriate publications are counted.

3. **Outputs due to the funded Graduate Assistants:** Both the Murine Behavioral Neurogenetics Facility (MBNF) and the Cognitive Science Shared Electrophysiology Research Laboratory (CSSERL) have provided reports on IBACS-supported activity during this past year: **MBNF** received 30 hours per week for 3 student GAs to support work in the facility, resulting in: *6 publications (3 published, 3 under review, and 1 in preparation) and 7 presentations at international conferences.* **CSSERL** received funding for 30 hours per week for 2 student GAs. One was placed in BIRC (10 hrs pw.). Her role was primarily dedicated to development of the high definition EEG system (both for in- and out-of-scanner use) and training others to use the system. An EEG/fMRI study she developed will form the basis for a grant application to be submitted in June. *Two conference presentations also resulted from this work.* The other GA (20 hrs pw.) was placed in the CSSERL space in the Arjona building. *This work resulted in 6 conference presentations.* Much of the effort in this first year of GA support at CSSERL was spent training other graduate and undergraduate students.

6. GOING FORWARD INTO 2017/18 & BEYOND

New outreach activities planned for 2017/18:

- Following a visit by the Director to Windham High School in Fall 2017 we shall start a series of graduate student presentations at the School, for the Biology Seniors. The format will be short (10-minute) presentations of research issues followed by Q&A. Graduate students will be drawn from the graduate student affiliates list. Graduate students will be coached.
- Dr. Tim Miller, Digital Media & Design Department, will host a Media Workshop open to all affiliates, On-Camera Training (invitation only – we shall identify 8-10 attendees), and subsequent Media Production sessions to develop short-form videos of IBACS research. Miller and his students will collaborate with IBACS researchers to develop scripts and storyboards for these films, and will then shoot, edit, produce necessary graphics or animations, and render the final products for distribution. These films will be created on a rolling basis throughout the Fall 2017 and Spring 2018 semesters, with a target of six finished films by the end of Spring 2018. These will be released on a dedicated YouTube channel.

New research-related activities planned for 2017/18:

- The **IBRAiN** program described above (evaluation to take place summer 2018)
- The **Meet-and-Speak** will be moved from March to May, and will be co-organised with an early evening talk on each of the two days. One internal speaker and one external speaker.

The IBACS affiliates to be polled for suggestions. The external talk will be widely advertised and pitched for the broader UConn community. Most likely to be held at the Thomas J Dodd Research Center, or in the larger OAK lecture theatre.

- Based on a model developed in Psychological Sciences and Linguistics, we shall put out a call for **integrative workshops** and/or other activities that identify common core goals and facilitate dialog towards generating multi-PI grants to appropriate funding institutions. We funded one such activity in early 2017 and shall monitor its success over the course of this next year.

Challenges facing the Institute:

The most immediate challenge is the renewal of funding beyond Years 1-3. The Academic Plan provided for three years' funding. The Provost's Office and CLAS committed to contributing funds in Years 1-3, while the Vice President for Research committed to Years 1 and 2. Recently, the VPR agreed to commit to Year 3 also, on the basis of our successes in Years 1 and 2. In Summer 2017 we hope to initiate discussion of funding for Years 4-6 on the basis of the outcome metrics described in Section 5 above (we typically commit to activities and related expenditure a year in advance – hence initiating these discussions a year before the end of the currently funded period). We would also hope, at the end of Year 5, to enter into negotiation for funding of Years 7-11. We believe that in the context of the metrics described in Section 5, which are likely to improve year-on-year as we mature further, this two-step plan for negotiating renewal of the Institute's funding (Years 4-6 and then Years 7-11) is realistic.

A longer-term challenge remains the lack of a physical focus for the Institute. While the Institute is successfully funding research activities distributed throughout and across the Storrs and UConn Health campuses, and encouraging new lines of research (and applications for its external funding), the vision of a physical hub housing graduate students and research labs from across the Brain and Cognitive Sciences remains an important aspiration for the Institute and the community it serves. For now, the Institute is facilitating developments to make Brain and Cognitive Sciences at UConn more prominent both nationally and internationally. A physical presence would allow the Institute to progress to the next level, allowing a physical intersection of the communities across the computational, behavioral, cognitive, and bench neurosciences. This would enable a whole that is many times the sum of its parts, and a presence that would be attractive to external funders. We believe that the current activities are a necessary first step towards building an environment in which a physical Institute could take shape, and we shall continue to work towards this goal.

One institutional challenge we face in respect of making UConn more prominent internationally is that it is extremely difficult to organize a conference or workshop at UConn. Our experience booking even a single person over this past year is that we cannot get them into Nathan Hale. Nor is there public or other easy transport to/from Bradley International Airport. The logistics involved in even bringing 12 people over has proved extremely challenging, and we had to turn down the opportunity to host a major international conference on language processing that attracts 300-400 attendees. Such conferences are a way of establishing universities as major centers of innovation and advance, and we are simply not competitive in this respect.

Finally, the Provost's office increased our budget in Year 2 to \$350K from the \$300K allocation for Year 1. This was to cover a proportion of the costs of the Director's lab manager given also her growing involvement in BIRC-related activity. The additional \$50K allowed us to keep her on, and deploy more of her time in BIRC (whose staff does not include a lab manager or equivalent). She estimates that she spends approximately 12-17 hours per week on BIRC-related activity (7 hours physically there, and 5-10 hours depending on the week working on experiment-specific scripts for controlling the eye-tracker and its interface to the MRI scanner). Her involvement in BIRC has proved invaluable both technically but also as a 'management interface' allowing the Institute to react rapidly

to situations at BIRC that can benefit from the Institute's support (cf. development of the IBRAiN program). We would like to keep her in this same position, splitting her time between the Director's lab, BIRC, and the other laboratory (Dr. Yee's) in which she is employed one third time. Ideally, this position would become fully underwritten by the Institute (her salary is included in a pending R01, and the intention would be to continue to apply for external funding for her salary, but ideally to use the Institute to bridge funding if external funding is not forthcoming).

7. BUDGET SUMMARY

The Appendix contains a summary of expenditure and commitments made. These figures may differ slightly from current account balances, due to unpaid commitments. To summarize here (all figures rounded to nearest \$1K):

Initial budget, July 1st 2016 – June 30th 2017:

\$350,000 from Tier 1 funding

\$150,000 from VPR

\$145,000 from CLAS

\$40,000 from NBL program (for joint summer fellowships)

\$7,289 misc rollover

\$ 692,289 total

Expenditure:

\$578,952

Commitments¹:

\$95,000

To carry forward into AY 2017/18²:

\$18,337

We anticipate for FY 2017/18 the same level of funding from Tier 1, VPR, and CLAS funds.

¹Commitments include Fall payroll for IBRAiN (\$81,000), reserved funds for Summer Grad fellows which will be paid upon their submission for external grant funding (\$13,000), and funds for NERDY workshop.

²Carry forward is underspend on CLAS account that will be available to the Institute in FY17/18

8. CASE STUDIES: INSTITUTE-SUPPORTED COLLABORATIONS

Here, we very briefly outline 2 case studies.

1. Mind-Brain-Viscera. This first case study describes a continuing collaboration between the Institute and UConn Health (specifically, the Center for Aging and the Department of Urology). It highlights the Institute's ability to foster cross-campus research and to integrate with UConn Health. This case study is related to a K76 award to Philip Smith in Urology that was supported by seed funding from the Institute.
2. Culturing brain tissue *in vitro*. The second describes an Institute-driven collaboration between UCHC/Connecticut Children's and UConn Storrs (BME). This is an example of how IBACS seed grants have provided resources to turn ideas into actual seed data on which basis to apply for extramural funding for a novel research program that has significant implications for research in medicine and what might be termed "neural engineering".

Mind-Brain-Viscera. This is an ongoing project that was initiated in Year 1 of the Institute's activities. It capitalizes on work by Dr. Phil Smith M.D. (Dept. of Urology) and Dr. George Kuchel (Center on Aging), with input on translational potential from Amy Gorin (InCHIP) and Gerry Altmann (Director, IBACS). In Year 1, the Institute supported the successful application of a K76 award to Phil Smith (the Institute had previously introduced Phil Smith to Dr. Daniel Mulkey, PNB, who studies similar control mechanisms to those studied by Smith but in respiration. The two are now collaborating as a part of Smith's research). Smith has data suggesting that "overactive bladder" (or "bladder urgency") is due to miscalibration of signals in the brain, rather than a problem at the bladder.

In October 2016, Altmann attended a conference at Bethesda, co-organized by Kuchel, on translational research into urinary incontinence (UI) in the elderly, to gain an understanding of how the Institute could best facilitate related research at UConn. Since then, Altmann, Kuchel, Gorin and Smith have met to discuss how to move forward on a project aiming to collect normative data on the subjective experience of bladder urgency in the general (elderly) population, as a prelude to investigating possible interventions (cognitive and neuromodulatory) that may alleviate some of the problems.

Altmann has been invited to submit a proposal to fund this research to the Chief Scientific Officer of PepsiCo. Separately, IBACS, InCHIP, and the Center on Aging are considering how else to generate funding for a seed project that would, in the first instance, establish through a literature review what data incidence and experience of bladder urgency currently exist and in what populations (most of the data is clinic-based, but the incidence of overactive bladder is believed to be vastly more prevalent in the general population than it is in those who present at clinics).

Culturing brain tissue *in vitro*. Dr. Tang-Schomer and Dr. Santaniello are two junior faculty members from UConn Health/Connecticut Children’s Medical Center and UConn Storrs, respectively. They met in Spring 2016 when Dr. Tang-Schomer was invited to give a seminar in the Biomedical Engineering department at UConn Storrs. Dr. Tang-Schomer’s focus is on developing 2D and 3D *in vitro* neural tissue models, including microfabrication and neural electrical interfaces for neuronal cultures. Dr. Santaniello’s work is mainly on neuromodulation for clinical applications. Despite working on two separate ends of the neural engineering spectrum, they found a common interest in understanding the effects of electrical stimulation on neurons, with a specific focus on the impact that electrical stimulation has on the neurons’ ability to encode information, adjust over time, and learn from external stimuli. This is a hot research topic at the interface between basic neuroscience and information theory, with huge potential to impact several fields such as medicine (e.g., treatment of patients with neurological disorders, epilepsy, learning disabilities, etc.), psychology (e.g., cognition and memory), and engineering (e.g., neural computation, information encoding, etc.).

Their collaboration started shortly after they met, in part facilitated by the fact that – during summer 2016 – Dr. Santaniello started working on data analysis methods for *in vitro* calcium imaging as part of an IBACS-funded project. Calcium imaging is an important component of Dr. Tang-Schomer’s experimental setup and is used to monitor the effects of electrical stimulation on neuronal cultures.

They received an IBACS-funded seed grant in Spring 2017: To put the research in very crude terms, it involves taking human brain tissue (neurons), laying it over an electrical interface that can stimulate it in various ways, recording the resultant neuronal activity, modeling that activity using computational methods, and designing protocols that will optimize the electrical stimulation in ways to stimulate neuronal growth in desired ways. This collaboration has already produced two extramural collaborative grant applications (one to the CT Regenerative Medicine Research Fund, one to the CURE Foundation for Epilepsy Research) and one submission to the BMES Annual Meeting, one of the most prestigious conferences in Biomedical and Neural Engineering. Joint research activities are planned for summer 2017 and it is expected that pilot data will be generated for a NIH grant application in Fall 2017.

These are just two of the 24 research projects that the Institute has supported since its inception. They exemplify the success of the Institute in its mission to bring together researchers who would not otherwise have met, or had the resources needed to turn ideas into data, and to encourage collaborative and interdisciplinary research that pushes at the frontiers of scientific discovery. The research funded by the Institute is intended to build an intellectual ethos that will ensure financial sustainability of the Brain and Cognitive Sciences community here at UConn.

APPENDICES

1. Budget Summary
2. Recipients and topics of IBACS Seed Grants
3. Recipients of IBACS Graduate Summer Fellowships
4. Recipients of IBACS Undergraduate Research Fellowships
5. Recipients of IBACS IBRAiN Research Assistantships
6. Journal articles describing IBACS-supported research
7. Meet and Speak Program

APPENDIX 1

BUDGET SUMMARY

STARTING BUDGET	\$692,289 (includes underspend from Year 1)
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APPENDIX 2

IBACS SEED GRANTS

Only the lead PI is listed, although in all cases there were one or more collaborators and Co-PIs. Details of each can be found at <http://ibacs.uconn.edu/research/>

Lead PI	Dept.	Title	Award Amount
Paul Allopenna	PSY	Deep Learning: Hardware for Computation-Intensive Models of Language	\$8,300
Dorit Bar-On	PHIL	“What’s in a Word” ECOM Research Group Fall 2016 Workshop	\$5,000
Marie Coppola	PSY	Community Engagement in Deafness and Autism Research (CEDAR)	\$9,948
Damir Dzhafarov	MATH	UConn Logic Group	\$5,200
James Dixon	PSY	Non-Equilibrium Thermodynamics of Learning in Dissipative Networks	\$20,000
Inge-Marie Eigsti	PSY	Pilot Data Collection: Optimal Outcomes	\$5,500
Alexander Jackson	PNB	Defining Hypothalamic Neuronal Cell Types that Orchestrate Motivated Behavior	\$6,000
Nicole Landi	PSY	Neurobiological signatures of perception, integration and imitation of speech in children with ASD (associated with grant-writing workshop)	\$10,000
James Magnuson	PSY	Developing an NSF Research Trainee Proposal	\$7,900
Phillip Smith	UCHC	Redefining the Aging Bladder: A Genomic Approach	\$9,990
Min Tang-Schomer	UCHC	Development of a Functional Neuronal Circuit with Human Neurons In Vitro	\$18,977
Mason Yeh	UCHC	Development of a Stem Cell Derived 3D Culture Model of Human Cortical Development	\$23,920
John Salamone	PSY	Inflammation effects on effort-based decision making: relevance for depression	\$15,000 (joint InCHIP)
Adam Lepley	Kinesiology	Motor control deficits after ACL reconstruction: underlying cortical adaptations	\$15,000 (joint InCHIP)

APPENDIX 3
IBACS GRADUATE SUMMER FELLOWSHIPS
 (IN CONJUNCTION WITH NBL GRADUATE PROGRAM)

Name	Department	Advisor
Battison, Alexandria	Physiology & Neurobiology	Joe Loturco
Baumgartner, Mary	Physiology & Neurobiology	Rahul Kanadia
Casavant, Sharon	Nursing	Holly Fitch
Cerrone, Pietro	Linguistics	Jon Sprouse
Contreras, Jessica	Psychological Sciences	Marie Coppola
Dhaim, Ashley	Psychological Sciences	Tehran Davis
Fujita, Akie	Biomedical Engineering	Alexander Jackson
Hattori, Ryosuke	Linguistics	William Snyder
Li, Lu	Mechanical Engineering	Savas Tasoglu
Lindsey, Andre	Speech, Language & Hearing Sciences	Carl Coelho
Lopez-Felip, Maurici	Psychological Sciences	Tehran Davis
Lu, Jin	Computer Science & Engineering	Jinbo Bi
Ly, Monica	Psychological Sciences	Chi-Ming Chen
McGee, Shireena	Psychological Sciences	Adam Sheya
Parker, Ashley	Speech, Language & Hearing Sciences	Bernard Grela
Perrino, Peter	Psychological Sciences	Holly Fitch
Petrosino, Roberto	Linguistics	Jon Sprouse
Rainear, Adam	Communication	Kenneth Lachlan
Salisbury, Jenelle	Philosophy	Susan Schneider
Sawi, Oliver	Psychological Sciences	Jay Rueckl
Tecoulesco, Vivi	Psychological Sciences	Letitia Naigles
Troha, Ryan	Psychological Sciences	Etan Markus
Wei, Yi	Psychological Sciences	Edward Large

APPENDIX 4

IBACS UNDERGRADUATE RESEARCH FELLOWSHIPS

Name	Department	Advisor
Babbit, Ben	Physiology and Neurobiology	Joanne Conover
Boudreau, Kate	Psychological Sciences	Amy Gorin
Buscarelli, Alexandra	Psychological Sciences	Holly Fitch
Dong, Danni	Psychological Sciences	Etan Markus
Hunt, William	Biomedical Engineering	Kevin Brown
Jones, Maranda	Speech, Language & Hearing Sciences	Erika Skoe
Padua, Michelle	Psychological Sciences	Rob Astur
Raajpoot, Aleena	Physiology and Neurobiology	Karen Menuz
Randazzo, Ericka	Physiology and Neurobiology	Joe Loturco
Schwartz, Rebecca	Psychological Sciences	John Salamone
Singh, Deepinder	Physiology and Neurobiology	Joanne Conover
Ye, Brianna	Psychological Sciences	John Salamone

APPENDIX 5
IBACS BIRC RESEARCH ASSISTANTSHIPS IN NEUROIMAGING (IBRAIN)

Name	Department	Advisor
Davis, Charles	Psychological Sciences	Eiling Yee
Li, Monica	Psychological Sciences	Jim Magnuson
Michaels, Timothy	Psychological Sciences	Chi-Ming Chen
Prystauka, Yanina	Psychological Sciences	Gerry Altmann
Ryherd, Kayleigh	Psychological Sciences	Nicole Landi

APPENDIX 6

PUBLICATIONS:

July 1st 2016 – June 30th 2017

Recipients of seed grants, and affiliate members, were asked to submit articles and book chapters published since July 1st 2016 that were supported directly or indirectly by IBACS. “Direct Support” means that the Institute had funded work that was described or referred to in the published work, or had funded work that led, one way or another, to the published work. “Indirect Support” means work that had been “inspired” by IBACS-related activities or the ethos that has been generated since the inception of the Institute. Names in bold indicate IBACS affiliates.

A. DIRECTLY SUPPORTED OUTPUTS

1. Peer Reviewed Journal Articles Directly Supported by IBACS, published or in press

- Altmann, G.T.M.** (2017). Abstraction and generalization in statistical learning: implications for the relationship between semantic types and episodic tokens. *Philosophical Transactions of the Royal Society B* 372: 20160060. doi:10.1098/rstb.2016.0060
- Bonnavion P, **Fujita A**, Colas D, Wilson MH, Mickelson LE, de Lecea L and **Jackson AC** (2016) Optogenetic control of histamine neurons in HDC-Cre mutant mice. *Journal of Sleep Research*. 25, pp.26.
- Bonnavion P, Mickelsen LE, **Fujita A**, de Lecea L and **Jackson AC**. (2016) Hubs and Spokes of the Lateral Hypothalamus: Cell Types, Circuits and Behavior (Review). *Journal of Physiology*. Nov. 15, 594(22): pp. 6443-6462.
- Canfield, A. R., **Eigsti, I. M.**, de Marchena, A., & Fein, D. (2016). Story goodness in adolescents with autism spectrum disorders and in optimal outcomes from ASD. *Journal of Speech, Language and Hearing Research*, 59, 533–545. doi:10.1044/2015_JSLHR-L-15-0022
- Gettens, K. M., & Gorin, A. A.** (2017). Executive function in weight loss and weight loss maintenance: a conceptual review and novel neuropsychological model of weight control. *Journal of Behavioral Medicine*, 1-15.
- Suh, J., **Eigsti, I. M.**, Canfield, A., Irvine, C., **Naigles, L.**, & Fein, D. A. (2016). Language representation and language use in children with optimal outcomes from autism spectrum disorder. In L. Naigles (Ed.), *Innovative Investigations of Language in Autism Spectrum Disorder* (pp. 225-244). Berlin, Germany: APA/Walter de Gruyter. doi:10.1044/2015_JSLHR-L-15-0022
- Suh, J., Orinstein, A., Barton, M., **Chen, C. M.**, **Eigsti, I. M.**, Ramirez-Esparza, N., & Fein, D. (2016). Ratings of Broader Autism Phenotype and Personality Traits in Optimal Outcomes from Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 46(11), 3505-3518. doi:10.1007/s10803-016-2868-4

2. Peer Reviewed Journal Articles Directly Supported by IBACS, under review

- Fujita A**, Bonnavion P, Wilson MH, Mickelsen LE, de Lecea, L and **Jackson AC**. Hypothalamic tuberomammillary nucleus neurons: electrophysiological diversity and essential role in arousal stability. *Journal of Neuroscience*.
- Mickelsen LE, Kolling IV FW*, Chimileski B, Norris CE, Nelson CE and **Jackson AC**. Neurochemical diversity of lateral hypothalamic hypocretin/orexin and melanin-concentrating hormone neurons identified through single-cell transcriptional profiling. *eNeuro*.
- Todd K.L.**, Brighton T., Norton E., Schick S., Elkins W., Pletnikova O., Fortinsky R.H., Troncoso J.C., **Molfese P.J.**, Resnick S.M., **Conover J.C.** Ventricular and Periventricular Anomalies in the Aging and Cognitively Impaired Brain. *Alzheimer's Disease Neuroimaging Initiative*.

3. Book Chapters Directly Supported by IBACS

- Conover, J.C, Todd, K.L.** (2017). Neuronal Stem Cell Niches of the Brain. *Biology and Engineering of Stem Cell Niches* (eds, A. Vishwakarma and J Karp, Elsevier publishers) Invited Chapter
- Yee, E., Jones, M. N., & McRae, K.** (2017). Semantic Memory In J. T. Wixted & S. Thompson Schill (Eds), *The Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience* (4th Edition, Volume 3: Language and Thought). New York: Wiley.

4. Conference Presentations and Abstracts Directly Supported by IBACS

- Baumgartner, M., Perrino, P.A., Fitch, R.H., Kanadia, R.N.** 2016. Haploinsufficiency of the minor spliceosome-specific U11 snRNA in the mouse cortex results in enhanced motor performance. Poster presented at *Society for Neuroscience*, Nov 2016, San Diego, CA.
- Bonnavion P, **Fujita A**, Colas D, Wilson MH, Mickelsen LE, de Lecea L and **Jackson AC**. (2016) Optogenetic control of histamine neurons in HDC-Cre mutant mice. *23rd Congress of the European Sleep Research Society (Bologna)*.
- Flaig, N. K. (g), Margulis, E. H., **Molfese, P. J.**, Kroger, C. & **Large, E. W.** (2016). Real or perceived? Neural underpinnings of expectations in the enjoyment of performances. In *Proceedings of the 14th Annual International Conference on Music Perception and Cognition*, in press, San Francisco, CA, Jul 5-8.
- Fujita, A**, Bonnavion P, Wilson MH, Mickelsen LE, de Lecea, L and **Jackson AC**. (2016) Electrophysiological characterization and optogenetic silencing of hypothalamic tuberomammillary nucleus histaminergic neurons in a transgenic mouse line. *Society for Neuroscience Abstracts*.
- Kim, J. C., & **Large, E. W.** (2016). A gradient frequency neural network model of auditory scene analysis. *Society for Neuroscience Abstracts*, 41, 431.04.
- Kim, J. C., & **Large, E. W.** (2016). A nonlinear dynamical systems approach to auditory scene analysis. In *Proceedings of the 14th Annual International Conference on Music Perception and Cognition*, San Francisco, CA, Jul 5-8.
- Kim, J. C., & **Large, E. W.** (2016). Multiple F0 estimation by gradient frequency neural networks. *6th Annual Seminar on Cognitively Based Music Informatics Research*, New York, NY, Aug 12.
- Mickelsen LE, Kolling IV FW, Chimileski B, Norris CE, Nelson CE and **Jackson AC**. (2016) The neurochemical phenotype of lateral hypothalamic hypocretin/orexin and melanin-concentrating hormone neurons identified through single-cell transcriptional profiling. *Society for Neuroscience Abstracts*.
- Perrino, P.A.**, Rendall, A.R., **LoTurco, J.J.** & **Fitch, R.H.** 2016. Evaluation of visual motion perception ability in mice with knockout of the dyslexia candidate susceptibility gene *Dcdc2*. Poster presented at *Society for Neuroscience*, Nov 2016, San Diego, CA (published Abstract).
- Perrino, P.A.**, Rendall, A.R., Newbury, D., **LoTurco, J.**, Buscarello, A. & **Fitch, R.H.** 2017. Behavioral Assessment of *Ush2a* KO Mice. To be presented at *Society for Neuroscience*, Nov 2017, DC (published Abstract).
- Peters, T.J., **Conover, J.**, McManus, D., Pratt, K., Williams, K.D. (2016). Visual Experiments of Geometric Combinatorics. Neural Stem Cells and Their Derivatives. In *Proceedings of the Bioinformatics and Computational Biology Conference (BICOB)*
- Presby, R., Yang, J.-H., Cayer, S., Rotolo, R., **Fitch, R.H.**, Correa, M., **Salamone, J.D.** 2017. Effort-related decision making in mice: A genetic study. Poster presented at *N.E.U.R.O.N.*, Feb 2017, New Haven, CT.

- Presby, R., Yang, J.-H., Cayer, S., Rotolo, R., **Fitch, R.H.**, Correa, M., **Salamone, J.D.** 2017. Effort-related decision making in mice: a genetic and pharmacological study using touchscreen operant methods. To be presented at *Society for Neuroscience*, Nov 2017, DC (published Abstract).
- Santaniello, S., Tang-Schomer, M.**, Kaplan, D. (2017). Electrical Stimulation for Neuronal Activation and 3D Growth in Vitro. In *Proceedings of Biomed Eng Soc Meeting (BMES) 2017* (1 page).
- Wasserman, C. S.**, Kim, J. N., **Large, E. W.**, & **Skoe, E.** (2016). Finding the Beat: Investigating Neural Resonance using Simultaneously-recorded Cortical and Subcortical Steady-State Responses. In *Proceedings of the 14th Annual International Conference for Music Perception and Cognition*, San Francisco, CA, Jul 5-8.
- Wasserman, C. S.**, Kim, J. N., **Large, E. W.**, & **Skoe, E.** (2016). Finding the beat: Simultaneously recorded cortical and subcortical steady-state responses to missing pulse rhythms. In *Proceedings of the 24th Annual International Society for Neurofeedback and Research*, in press, Orlando, FL, Sep 21-24.
- Wasserman, C. S.**, Kim, J. N., **Large, E. W.**, & **Skoe, E.** (2016). Neural Resonance Theory: Entrainment to Missing Pulse Rhythms. In *Proceedings of the 38th Annual Meeting of the Cognitive Science Society*, pg. 3000, Philadelphia, PA, Aug 10-13.
- Wasserman, C. S.**, Kim, J. N., **Large, E. W.**, & **Skoe, E.** (2016). Finding the Beat: Neural Responses to Missing Pulse Rhythms. *Frequency Following Response Workshop*, Boston University, Boston, MA, May 19-20.
- Wasserman, C. S.**, Kim, J. N., **Wei, Yi.**, **Skoe, E.**, **Read, H.L.**, & **Large, E. W.** (2017). Finding the Beat: Neural Entrainment to Missing Pulse Rhythms. In *Proceedings of the 6th Meeting of the NeuroMusic Conference*, in press, Boston, MA.
- Wasserman, C. S.**, Kim, J. N., **Wei, Yi.**, **Skoe, E.**, **Read, H.L.**, & **Large, E. W.** (2017). Finding the Beat: Testing Dynamical Predictions Using Missing Pulse Rhythms. In *Proceedings of the Society for Music Perception and Cognition 2017 Conference*, in press, San Diego, CA.

B. INDIRECTLY SUPPORTED OUTPUTS

1. Peer Reviewed Journal Articles Indirectly Supported by IBACS, published or in press

- Akkalkotkar, A., Brown, K.S.** (2017). An algorithm for separation of mixed sparse and Gaussian sources. *PLoS ONE* 12(4): e0175775. doi:10.1371/journal.pone.0175775
- Bar-On, D.** (2016). Sociality, Expression, and This Thing Called Language. *Inquiry*, 59 (1). doi:10.1080/0020174X.2015.1115273
- Bonnaivon, P., **Mickelsen, L.**, **Fujita, A.**, de Lecea, L., **Jackson, A.C.** (2016). Hubs and Spokes of the Lateral Hypothalamus: Cell Types, Circuits and Behavior (Review). *Journal of Physiology*. Nov. 15, 594(22): pp. 6443-6462. doi: 10.1113/JP271946
- Brynskov, C., (g) **Eigsti, I. M.**, Jørgensen, M., Lemcke, S., Bohn, O.-S., & Krøgaard, P. (2017). Syntax and morphology in Danish-speaking children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 47(2), 373-383. doi:10.1007/s10803-016-2962-7
- Castelluccio, B. C. (g)**, **Myers, E. B.**, Schuh, J. M., & **Eigsti, I. M.** (2016). Neural substrates of processing anger in language: Contributions of prosody and semantics. *Journal of Psycholinguistic Research*, 45(6), 1359-1367. doi:10.1007/s10936-015-9405-z
- Che, A., Truong, D.T., **Fitch, R.H.**, **LoTurco, J.J.** (2016) Mutation of the Dyslexia-Associated Gene *Dcdc2* Enhances Glutamatergic Synaptic Transmission Between Layer 4 Neurons in Mouse Neocortex. *Cereb Cortex*. 26 (9), 3705-3718. doi:10.1093/cercor/bhv168
- Conover, J.C., Todd, K.L.** (2016). Development and Aging of a Brain Neural Stem Cell Niche. *Experimental Gerontology* PMID:27867091. doi: 10.1016/j.exger.2016.11.007

- Earle, F.S., **Landi, N., and Myers, E.B.** (2017). Sleep duration predicts behavioral and neural differences in adult speech sound learning. *Neuroscience Letters*, 636:77-82. doi: 10.1016/j.neulet.2016.10.044.
- Eigsti, I. M.** (2013, 2017). Entry: Theories of language development. In F. R. Volkmar (Ed.), *Encyclopedia of Autism Spectrum Disorders*. New York: Springer Verlag.
- Eigsti, I. M.** (2013, 2017). Entry: Peabody Picture Vocabulary Test. In F. R. Volkmar (Ed.), *Encyclopedia of Autism Spectrum Disorders*. New York: Springer Verlag.
- Eigsti, I. M., & Schuh, J. M.** (g) (2016). Language acquisition in autism spectrum disorders: Beyond standardized language measures. In L. Naigles (Ed.), *Innovative Investigations of Language in Autism Spectrum Disorder* (pp. 183-200). Berlin, Germany: APA/Walter de Gruyter. doi: 10.1016/j.rasd.2010.09.001
- Fink, J.J., Robinson, T.M., **Germain, N.D.**, Sirois, C.L., Bolduc, K.A., Ward, A.J., Rigo, F., Chamberlain, S.J., **Levine, E.S.** (2017). Disrupted neuronal maturation in Angelman syndrome-derived induced pluripotent stem cells. *Nature Communication*. doi: 10.1038/ncomms15038
- Fitch, H. R.** (2016). Animal Models of Neurodevelopment Disruption and Associated Acoustic Processing. *Audiology Today*, 28(4), 53
- Gettens, K. M., & Gorin, A. A.** (2017). Executive function in weight loss and weight loss maintenance: a conceptual review and novel neuropsychological model of weight control. *Journal of Behavioral Medicine*, 1-15. doi:10.1007/s10865-017-9831-5
- Hall, M. L., Eigsti, I. M., Bortfeld, H., & Lillo-Martin, D.** (2016). Auditory deprivation does not impair executive function, but language deprivation might: Evidence from a parent-report measure in Deaf native signing children. *Journal of Deaf Studies and Deaf Education*, 22(1), 9-21. doi:10.1093/deafed/enw054
- Hall, M. L., Eigsti, I.-M., Bortfeld, H., & Lillo-Martin, D.** (in press). Auditory access, language access, & Implicit sequence learning in deaf children. *Developmental Science*.
- Harwood, V., Preston, J., **Grela, B.**, Roy, D., Harold, O., Turcios, J., Andrada, K., **Landi, N.** (2017). Electrophysiology of perception and processing of phonological information as indices of toddlers' language performance. *Journal of Speech, Language, and Hearing Research*, 60, 1-13. doi:10.1044/2016_JSLHR-L-15-0437.
- Jenkins, T., **Coppola, M., & Coelho, C.** (in press). Effects of gesture restriction on quality of narrative production. *Gesture*.
- Landi, N., & Ryherd, K.** (2017). Understanding specific reading comprehension deficit: A review. *Language and Linguistics Compass*, 11(2). doi:10.1111/lnc3.12234
- Lieberman, R., Kranzler, H.R., **Levine, E.S.**, Covault, J. (2016). Examining FKBP5 mRNA expression in human iPSC-derived neural cells. *Psychiatry Research*. doi:10.1016/j.psychres.2016.11.027
- Myers, E.B., and Theodore, R.** (2017). Voice-sensitive brain networks encode talker-specific phonetic detail. *Brain and Language*, 165:33-44. doi: 10.1016/j.bandl.2016.11.001
- Naigles, L.R.** & Tek, S. (in press). 'Form is easy, meaning is hard' revisited: (Re) Characterizing the Strengths and Weaknesses of Language in Children with Autism. *Wiley Interdisciplinary Reviews: Cognitive Science*. doi: 10.1002/wcs.1438
- Rendall, A.R., Ford, A.L., **Perrino, A.P. & Fitch, R.H.** (in press). Auditory processing enhancements in the Ts2-neo mouse model of Timothy Syndrome, a rare genetic disorder associated with autism spectrum disorders. *Advances in Neurodevelopmental Disorders*
- Rendall, AR, Truong, DT, **Fitch, RH.** (2016). Learning Delays in a mouse model of Autism Spectrum Disorder. *Behavioral Brain Research*, 303, 201-207. doi:10.1016/j.bbr.2016.02.006
- Schuh, J. M. (g), **Eigsti, I. M.**, & Mirman, D. (2016). Referential communication in autism spectrum disorder: The roles of working memory and theory of mind. *Autism Research*. doi:10.1002/aur.1632

- Skoe, E., Brody L, Theodore RM** (2017). Reading ability reflects individual differences in auditory brainstem function, even into adulthood. *Brain and Language* 164:25-31. doi: 10.1016/j.bandl.2016.09.003
- Skoe, E., Burakiewicz, B., Figuirodo, M., Hardin, M.** (2017). Basic neural processing of sound in adults is influenced by bilingual experience. *Neuroscience* 349:278-290. doi:10.1016/j.neuroscience.2017.02.049
- Smith, P.P.** (2017). Pathophysiology of the Underactive Bladder: Evolving New Concepts. *Current Bladder Dysfunction Reports*. doi: 10.1007/s11884-017-0407-6
- Srinivasan, S. M., **Eigsti, I. M.**, Gifford, T., & Bhat, A. N. (2016). The effects of embodied rhythm and robotic interventions on the spontaneous and responsive verbal communication skills of children with Autism Spectrum Disorder (ASD): A further outcome of a pilot randomized controlled trial. *Research in Autism Spectrum Disorders*, 27, 73-87. doi: 10.1016/j.rasd.2016.04.001
- Srinivasan, S. M., **Eigsti, I. M.**, Neelly, L., & Bhat, A. N. (2016). The effects of embodied rhythm and robotic interventions on the spontaneous and responsive social attention patterns of children with Autism Spectrum Disorder (ASD): A pilot randomized controlled trial. *Research in Autism Spectrum Disorders*, 27, 54-72. doi:10.1016/j.rasd.2016.01.004
- Stevenson, I.H.** (2016). Flexible models for spike count data with both over- and under- dispersion. *Journal of Computational Neuroscience*, 41(1), 29-43. doi: 10.1007/s10827-016-0603-y
- Tek, S. & **Naigles, L.R.** (2017). The Shape Bias as a Word Learning Principle: Lessons from and for Autism Spectrum Disorder. *Translational Issues in Psychological Science* 3, 94-103. doi: 10.1037/tps0000104
- Tichko, P., Skoe, E.** (2017). Frequency-dependent fine structure in the frequency-following response: The byproduct of multiple generators. *Hearing Research* 348:1-15. doi:10.1016/j.heares.2017.01.014
- Todd, K.L., Baker, K.L., Eastman, M.B., Kolling, F.W., Trausch, A.G., Nelson, C.E., Conover, J.C.** (2017). EphA4 regulates neuroblast and astrocyte organization in a neurogenic niche *Journal of Neuroscience*. 37(12) 3331-3341. doi:10.1523/JNEUROSCI.3738-16.2017
- Xie, X., **Theodore, R., and Myers, E.B.** (2017). More than a boundary shift: perceptual adaptation to foreign-accented speech reshapes the internal structure of phonetic categories. *Journal of Experimental Psychology: Human Perception and Performance*, 43(1): 206-217. doi:10.1037/xhp0000285
- Yee, E., & Thompson-Schill, S.L.** (2016). Putting Concepts into Context. *Psychonomic Bulletin and Review*, 23(4), 1015-1027. doi:10.3758/s13423-015-0948-7
- Yeh, M.L., Selvam, R., Levine, E.S.** (2017). BDNF-induced endocannabinoid release modulates neocortical glutamatergic neurotransmission. *Synapse*. doi:10.1002/syn.21962
- Zhang, Y., Linder, M.H., Shojaie, A., Ouyang, Z., Shen, R., Baggerly, K.A., Baladandayuthapani, V. and Zhao, H.** (2017). Dissecting Pathway Disturbances Using Network Topology and Multi-platform Genomics Data. *Statistics in Biosciences*, pp.1-21. doi:10.1007/s12561-017-9193-0
- Zhang, Y., Ouyang, Z. and Zhao, H.** (2017). A statistical framework for data integration through graphical models with application to cancer genomics. *The Annals of Applied Statistics*, 11(1), pp.161-184. doi:10.1214/16-AOAS998

2. Peer Reviewed Journal Articles Indirectly Supported by IBACS, under review

- Bar-On, D.** Crude Meaning, Brute Thought (or: What Are They Thinking?!). *Journal for the History of Analytic Philosophy* (special issue)
- Bar-On, D.** Gricean Intentions, Expressive Communication, and Origins of Meaning. *Routledge Companion to the Philosophy of Animal Minds* (Andrews and Beck, eds.)
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- Bar-On, D.**, Moore, R. Pragmatic Interpretation and Signaler-Receiver Asymmetries in Animal Communication. *Routledge Companion to the Philosophy of Animal Minds* (Andrews and Beck, eds.).
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- Mickelsen, L.E.**, Kolling, I.V, Chimileski B., Norris, C.E., Nelson, C.E., and **Jackson, A.C.** Neurochemical diversity of lateral hypothalamic hypocretin/orexin and melanin concentrating hormone neurons identified through single-cell transcriptional profiling. *eNeuro*.
- Patel, N., Jaishankar, R., Granite, S. J., Winslow, R. L., Sarma, S. V., **Santaniello, S.** (2016). Network based features capture interactions in physiological time series to discriminate sepsis and nonsepsis states. *IEEE Transactions on Biomedical Engineering*.
- Sumsky, S., **Santaniello, S.** (2017). Thalamic feedback in closed-loop deep brain stimulation: a model-based approach. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*.
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3. Book Chapters Indirectly Supported by IBACS

- Coelho, C.A.**, Lindsey, A. (in press). Traumatic brain injury, blast injuries, and multisystem injuries. In: L.L. LaPointe (Ed.) *Aphasia and Related Neurogenic Language Disorders*, 5th Edition. New York, NY: Thieme Publishers.
- Fitch, R.H.**, Bodge (*nee Hill*), C. (g), Szalkowski, C. (g) & Smith, A.S. (g) (2017). Animal models of early neural disruption: Sex differences, neuroplasticity, and implications for dyslexia. In: *Dyslexia & Neuroscience: The Geschwind-Galaburda Hypothesis, 30 Years Later*. (Eds. Galaburda, A., Gaab, N., Hoeft, F. & McCardle, P.), chapter 8, Brookes Publishing, Baltimore, MD.
- Yee, E.** (2017). Fluid semantics: Semantic knowledge is experience-based and dynamic.pdf. In A. Lahiri & S. Kotzor (Eds), *The Speech Processing Lexicon: neurocognitive and behavioural approaches* (pp. 235-262). Berlin/Boston: Mouton.
- Yee, E., & Altmann, G. T. M.** (in press). Associative memory, figurative art, and abstract concepts. *#Nodes*. G. Schwartz & V. Bermudez (Eds.).

4. Conference Abstracts Indirectly Supported by IBACS:

- Deng, C., Sun, T., Zhang, M., Gale, J. T., Montgomery, Jr. E. B., **Santaniello, S.** (2017). Effects of the Temporal Pattern of Subthalamic Deep Brain Stimulation on the Neuronal Complexity in the Globus Pallidus. *Conference Proceedings for the IEEE Eng Med Biol Soc.* 2017 (4 pages).
- Huang, H. D., **Santaniello, S.** (2017). Closed-loop Low-Frequency DBS Restores Thalamocortical Relay Fidelity in a Computational Model of the Motor Loop. *Conference Proceedings for the IEEE Eng Med Biol Soc.* 2017 (4 pages).
- Murphy, P. M., von Paternos, A. J., **Santaniello, S.** (2017). A Novel HFO-based Method for Unsupervised Localization of the Seizure Onset Zone in Drug-Resistant Epilepsy. *Conference Proceedings for the IEEE Eng Med Biol Soc.* 2017 (4 pages).

von Paternos, A. J., Murphy, P. M., Schmidt, S., Hassan, S., **Santaniello, S.** (2017). A Diagnostic System for Automatic Seizure Onset Zone Localization. *Conference Proceedings for the Biomed Eng Soc Meeting (BMES)2017* (1 page).

APPENDIX 7



CONNECTICUT INSTITUTE FOR THE BRAIN
AND COGNITIVE SCIENCES



Meet-and-Greet Event

Thursday, March 23rd, 2017

9:00 AM	<u>Breakfast and Coffee</u>
9:25 AM	Opening Remarks
9:30 AM	Gerry Altmann , Director, CT Institute for the Brain and Cognitive Sciences <i>Welcome to the Institute</i>
9:45 AM	John Salamone , Psychological Sciences <i>Pharmacological and chemogenetic approaches to studying the role of dopamine in effort-related decision making</i>
10:02 AM	Dorit Bar-On , Philosophy <i>Expression, Communication, and Origins of Meaning</i>
10:19 AM	Joe Loturco , Physiology and Neurobiology <i>A Technology for Imaging Neuron Type Specific Activity Patterns Across Cerebral Cortex</i>
10:36 AM	Holly Fitch , Psychological Sciences <i>Transgenic mouse models of enhanced low-level acoustic processing in ASD</i>
10:50 AM	<u>Coffee Break</u>
11:10 AM	Jim Magnuson , Psychological Sciences <i>Interdisciplinary PhD training in the Brain and Cognitive Sciences</i>
11:17 AM	Kevin Brown , Biomedical Engineering <i>Network Approaches to Lexical Structure</i>
11:34 AM	Alicia Liu (on behalf of Michael O'Neill) , Molecular and Cell Biology <i>Mouse Models to Investigate Environmental/Genetic Contributions to ASD</i>
11:51 AM	Letty Naigles/Erika Skoe , Psych Sciences/Speech, Language & Hearing Sciences <i>Brain Correlates to Early Language in Typical Children and Children with ASD</i>
12:08 PM	Joanne Conover , Physiology and Neurobiology <i>Ventricle System Changes Associated with Age-Related Ventriculomegaly and Fetal Hydrocephalus</i>
12:25 PM	<u>Buffet Lunch</u>
	<u>Continued....Graduate Student DataBlitz, reverse side</u>



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1:30 PM

Graduate Student DataBlitz

1:30 PM

Yanina Prystauka, Psychological Sciences
Dimensions of Change

1:37 PM

Glenn Milton, Molecular and Cell Biology
X-Linked Imprinted Genes and the Link to Autism Spectrum Disorder

1:44 PM

Vivi Tecoulesco, Psychological Sciences
Linking Auditory Processing and Lexical Representation via Phonological Discrimination

1:51 PM

Ryosuke Hattori, Linguistics
Parametric Prerequisite: Seeking Evidence from IPL

1:58 PM

Henry Wolf, Psychological Sciences
GPU computing for deep neural networks

2:07 PM

Peter Perrino, Psychological Sciences
A Behavioral Assessment of Ush2a KO Mice

2:12 PM

Linda Boshans, Physiology and Neurobiology
Understanding the molecular mechanisms of Dlx2 in NG2 cell reprogramming

2:19 PM

Charles Davis, Psychological Sciences
Concepts in context: effects of episodic context on processing abstract and concrete concepts

2:26 PM

Taylor Jackvony, UConn Health Center
Development of a Functional Neuronal Circuit with Human Neurons In Vitro

2:30 PM

Open Forum/Poster Session



Meet-and-Greet Event

Friday, March 24th, 2017

9:00 AM

Breakfast and Coffee

9:20 AM

Gerry Altmann, Psychological Sciences

Understanding events: Tracking a path through the brain

9:37 AM

Mason Yeh, Neuroscience

Development of a stem cell-derived 3D culture model of human cortical development

9:54 AM

James Dixon, Psychological Sciences

Learning in Dissipative Structures

10:11 AM

Inge-Marie Eigsti, Psychological Sciences

Special expertise in autism spectrum disorder

10:28 AM

Alexander Jackson, Physiology and Neurobiology

Cellular Taxonomy in the Lateral Hypothalamus

10:45 AM

Min Tang-Schomer, UConn Health Center

Development of a Brain-On-A-Chip model to understand neural network connectivity and information encoding

11:00 AM

Coffee Break

11:10 AM

Damir Dzhafarov, Mathematics

Presentation of the UConn Logic Group, an IBACS Affiliate

11:17 AM

William Snyder, Linguistics

Setting a Child's Linguistic Parameters

11:34 AM

Eiling Yee, Psychological Sciences

Using electrical stimulation (tDCS) to examine the role of left prefrontal cortex in semantic processing

11:51 AM

Phillip Smith, UConn Health Center

A Funny Current Happened on the Way to the John

12:08 PM

Rachel Theodore, Speech, Language and Hearing Sciences

Determinants of phonetic category structure in bilingual, infant, and language impaired populations

12:25 PM

Buffet Lunch

Continued...Graduate Student DataBlitz, reverse side



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1:30 PM

Graduate Student DataBlitz

1:30 PM

Andrew Parisi, Mathematics
Representation and Inference

1:37 PM

Nick Monto, Speech, Language & Hearing Sciences
That's what she said: Using a Bayesian belief-updating framework to examine talker-specificity in speech perception

1:44 PM

Cara Hardy, UConn Health Center
Ih Contributes to the Isoproterenol-induced Relaxation of Young Female Mouse Bladder Strips.

1:51 PM

Laura Mickelson, Physiology and Neurobiology
Synaptic connectivity of lateral hypothalamic inhibitory neurons that drive arousal behavior

1:58 PM

Ameya Akkalkotkar, Biomedical Engineering
An Algorithm for Separation of Mixed Sparse and Gaussian Signals

2:05 PM

Krysti Todd, Physiology and Neurobiology
Ventriculomegaly and accompanying gliosis associated with impaired fluid dynamics in the aging brain

2:12 PM

Anders Hogstrom, Psychological Sciences
Hyperlexia: A window on reward circuitry in Autism Spectrum Disorders

2:19 PM

Rose Presby, Psychological Sciences
Effort-related Decision Making in Mice: Genetic and Pharmacological Studies

2:26 PM

Amanda Coletti, Physiology and Neurobiology
Spatiotemporal Characterization of Ependymogenesis During Brain Development

2:30 PM

Open Forum/Poster Session