International Neuroscience
An Evolving Spectrum of Unique Opportunities and Experiences for Students and Faculty

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International Neuroscience

- Study Abroad and Global Learning
- Different Course Formats for Study Abroad
- Working with Affiliate Programs or Third Party Providers

313,415 US students studied abroad for academic credit 2014/2015

63% short-term
34% mid-length
3% long-term

STEM Fields: 24%
Business: 20%
Social Sciences: 17%

Host Regions of U.S. Study Abroad Students

55% Europe
16% Latin America & Caribbean
11% Asia
4% Oceania

Europe hosts over half of U.S. study abroad students.
**Study Abroad in Neuroscience**

- Is it a substantive and beneficial experience?
  - Foundational knowledge and skills are not location specific.

- Can relevant neuroscience skills develop simultaneously with global learning skills?

- How is global learning beneficial for neuroscience students?

- How do we quantify global learning?

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**Components of Global Learning for Neuroscience Study Abroad**

- Scientific Knowledge and Experience
- Career Development and Opportunities
- Intercultural Experiences

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**Global Learning: Intercultural Experiences**

- Ability to address contemporary global issues
- Meaningful interactions with people from other cultures
- Live comfortably in an unfamiliar culture
- Master skills and knowledge to participate in their chosen field.
- Think globally about career prospects and collaborative possibilities.

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**Global Learning: Scientific Knowledge and Career Development**

- What are the cost and benefits to different study abroad formats?
- How can a study abroad experience be more than a “trip” or a show-and-tell experience in the lab?
- How can a study abroad experience have a meaningful impact on career development?

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**Study Abroad Programs**

- Different Formats of Three Types of Short Term Study Abroad Programs
- Research Experiences & Internships
- Summer Programs
- First Year Programs
Research Internship Exchange Program

• Advanced Undergraduate and Master’s Students

Objectives and Goals

• Understanding of the international and collaborative nature of current neuroscience research.
• Recognition of new experimental approaches to scientific questions.
• Development of critical analysis and scientific writing skills.
• Familiarity with specific laboratory techniques, ideally expanding a student’s repertoire of skills.

Program Design and Content

• Application includes letter of intent with specific research interests.
• Preliminary correspondence between student, mentor, and internship coordinator from home university.
• Research project detailed prior to departure.
• Background reading completed prior to departure.
• For CofC Undergraduates
  — Biweekly submissions of progress, building towards a publication style write-up.
  — Post-experience interview and assessment.
  — Contribute to CofC Undergraduate “Guide to Bremen”

Practicalities and Logistics

• Students from CofC enroll in a 3 credit independent study.
  — No formal enrollment required at U Bremen admissions.
• Students from Bremen are designated at visiting research assistants.
  — No tuition, no formal transfer of credit. Fulfills requirement for Master’s degree

Timing Relative to Academic Calendar

• From Charleston to Bremen: May to July
• From Bremen to Charleston: February-April
Practicalities and Logistics

• Budget:
  – Flight
  – Room and Board
    • ~700 per month in Bremen
  – Tuition for CofC students
    • ~1400 in-state, ~1800 out-of-state

• Funding
  – Bremen: Grants for Student Travel
  – CofC: Scholarships and Grants up to ~3000.

Brain Maturation as Measured by Event-Related Oscillations in Adolescents through Electroencephalogram Recording.

– Dr. Birgit Mathes, University of Bremen
– Holly Fleischmann, CofC 2017

Outcomes and Assessment:

Challenges

• Timing relative to research programs
  – Interested faculty vs. Practical research constraints

• Funding

• Highly specialized program for top students with course background and experience.

• Large time investment for small number of students (1-3 students each year).

Substantive Intercultural Experience

Focused Research Experience Abroad

– 2014-2017
– 4 Poster Presentations
– 2 Manuscripts in Preparation

Student Enthusiasm: Continued Interest in Neuroscience Abroad

Development of Faculty Professional Research Programs and Relationships

Exchange between three very different institutions and administrative structures.

– International Exchange Agreement

• Timing relative to research programs
  – Interested faculty vs. Practical research constraints

• Funding

• Highly specialized program: Large time investment for small number of students.
Outcomes and Assessment

• Focused Research Experience Abroad
• Pedagogy Seminar and Teaching Mentorships available at CoC.
• Substantive Intercultural Experience
• Continued Interest in Neuroscience Abroad
• Development of Faculty Professional Research Programs and Relationships

Summer Abroad Program
Neuroscience Seminar in Germany

• Summer study abroad course, 4 weeks
• Munich and Berlin.
  • [Link](http://blogs.cofc.edu/germanneuro/)

Neuroscience Seminar in Germany: Partner Universities

Ludwig Maximilians Universität (LMU)  
Charité Medical University
Munich  
Berlin

Neuroscience Seminar in Germany: Course Content

• History of Behavioral and Medical Neuroscience (Munich and Berlin)
• Comparative and Systems Level Neuroscience (Munich)
• Neurophysiology and Medical Neuroscience (Berlin)

Neuroscience Seminar in Germany: Global and Discipline Specific Learning

• Course Learning Objectives
• Understanding of the international and collaborative nature of current neuroscience research.
• Exposure to the diverse fields of neuroscience.
• Recognition of the strengths of different experimental approaches to similar scientific questions.
• Development of critical analysis and scientific writing skills.
• Familiarity with specific laboratory techniques through lab visits/demonstrations and through laboratory exercises.

Neuroscience Seminar in Germany: Lecture-Lab Organization

• Background Reading and Lectures
• Critical Analysis of Primary Research Articles and Reviews
  • Student Presentations and Discussion
  • Journal Club Style Written Reports and Discussion.
• Faculty Seminar / Research Talks
• Lab Exercises and Demonstrations
• Information on Graduate Programs; Interactions with Grad Students
• Site Visits and Excursions
• Culture Junction
Neuroscience Seminar in Germany: 
Lectures, Labs, Discussions

“Overwhelming – I did not realize how many opportunities I had available. I found this experience so beneficial. It changed my outlook on the multiple possibilities and options.”

“You’re making it very difficult to go back to the states. This program was great”

Neuroscience Seminar in Germany: 
Time and Money

• Program Fee ~ $3300 - $4,450
• Tuition ~ $1900 in-state, $2500 out-of-state (4 credits)
• Timeline:
  – Application deadline is mid-February
  – Student deposits are not due until mid-late March
  – Travel begins late May
  – Scholarships
• Application

Neuroscience Seminar in Germany: 
Outcomes and Assessment

• Challenges:
  – Exposure to techniques and skills (not competency).
  – Limited opportunities for constructive feedback to students.
  – Intensive preparation and execution. Good partners at home and abroad are absolutely necessary!

Neuroscience Seminar in Germany: 
Outcomes and Assessment

• Benefits:
  – A wide diversity of novel approaches to neuroscience
  – Continued interest in neuroscience abroad
    • Two Fulbright Awards + One pending
    • Graduate School Applications
    • Other Research Abroad
  – Development of Faculty Professional Relationships

“Great balance of school and fun. I learned a lot…”

You’re making it very difficult to go back to the states. This program was great”
**Neuroscience Seminar in Germany: Growth, Nationalization and Looking Ahead**

- 47 Students from 24 Different Colleges and Universities.
- Amherst, Lehigh, Hunter College, Mt. Holyoke, University of Regina (Canada), Earlham, USC (CA), Kenyon, Buena Vista, Angelo State, SUNY Albany, Ohio Wesleyan, Regis, Trinity, Roanoke College, Bryn Mawr, GSSJ, Wooster, University of Michigan, Kenyon, Humboldt State, Washington and Lee.
- Coming again in 2019

**First Year Experience Abroad**

**Curricular Template for High Impact Learning Experience of Study Abroad**

First Year Experience Travel (FYET)
- 1 credit with travel over spring break
- 8 week academic course – meets once a week
- 8-9 day travel component over spring break
- Final meeting post-travel for course reflection
- Running Since 2012 across various disciplines - grown to 9 courses for spring 2018
- ~50% of students have gone on to an additional abroad experience
- Model could be adapted to run inside of a semester long upper-level course

**First Year Experience Abroad**

- Key Components Based on Student Assessment
  - Focus Groups
  - Reflective Essays
- Pre-Travel Course Connects Academic Work to Travel Experience
  - Previews academic nature of “place based learning”
  - Build in a practice of reflection before, during, and after the course
    - “The reflection questions helped to slow down and digest all that we had been experiencing. They are a nice to look back on so that I can remember everything that we were doing.”

**International Health and Medicine: Copenhagen**

**Pre-Travel Academic Course Components**
- American Medicine in an International Context
- Danish National Patient Registry
- Newborn Screening and Newborn Screening BioBank
- Public Opinion, Consent, and Population Genetic Biobanks
- Human Genetics Research, Unique Populations, and Disease Genes (Using Neurological Disease)
- Exploration of Danish Culture

**International Health and Medicine: Copenhagen**

- What are the historical underpinnings of the Patient and Tissue Registry System?
- Are they unique to a particular type of country and culture?
- How can they be useful for research?

**International Health and Medicine: Copenhagen**

In Country Experiences
- Danish National Museum – History of Denmark
- Copenhagen Medical Museum – History of Biological Collections
- Seminar and Tour of Danish National BioBank with Director
- Seminar – Copenhagen Medical Innovation Programs with Director
International Health and Medicine: Copenhagen

- Final Prompt: In class and abroad we have examined the Danish Medical Registry/BioBank system as well as Danish Culture/History. In your last two-page reflection, I would like you to write about one aspect of the medical registry/biobank system that you were most interested in or that has the most potential for improving human health. Can you see it becoming a bigger part of American medicine/research, why or why not? What is it about Danish culture that makes it work in Denmark, please provide one piece of evidence from our course readings and two pieces of cultural evidence from our course experiences while abroad in Copenhagen.

Third Party Providers

- Semester or Summer Abroad Programs.
- Stand Alone Programs with Research Component.
- International Studies Abroad (ISA)
- Cultural Experiences Abroad (CEA)
- ...many others

EURO Scholars – Semester Abroad

- Works with 7 European universities
- Identifies researchers or research programs, covers various disciplines
- http://www.euroscholars.eu

International Neuroscience: Opportunities and Challenges

Opportunities
- Infrastructure of our Home Institutions
- Development of New Faculty Led Programs
- International Exchange Agreements
- Funneling Students to Existing Programs
  - Third Party
  - Existing programs at home institution

Challenges
- Identifying Willing Mentors
- Ensuring Quality Project Experiences
- Housing
- Medical Insurance
- Supervision and Support at Home and Abroad
- Connecting to a Student Community
- Developing the requisite administrative structures within FUN
International Neuroscience: Opportunities and Challenges

How can FUN continue to develop international opportunities for undergraduates?

- First Year Abroad
- Summer Programs
- Semester Programs
- Exchange Programs that Incorporate an Authentic Research Experience for Undergraduates

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