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NEURONETWORKS

NEWSLETTER FOR THE WVU NEUROSCIENCE GRADUATE PROGRAM

FEATURED FACULTY

Candice Brown, Ph.D.

Dr. Brown has been at WVU for 5 years. She earned a PhD in Genetics and Genomics at Duke, and then conducted postdoctoral studies at UC Davis and the University of Washington. Her group is currently investigating how sepsis and dementia interact with each other on a cellular and molecular level, potentially making both diseases' symptoms more intense and their onset premature.

"There are two key issues: Sepsis can increase the age of onset and severity of dementia, but does dementia increase the onset of sepsis? Are patients becoming septic because their brain function is impaired and, therefore, other systems aren't working properly, or does sepsis cause cognitive impairment? It's like a chicken and egg scenario. We don't know, but we know the outcomes are not favorable. Few researchers or clinicians have addressed this long-term neurological outcome," Brown said.

The gut doesn't just impact the brain: It appears the brain impacts the gut as well. A recent study in mice showed that strokes unfavorably altered their gut bacteria and intestinal tissue even a month after the event, which could weaken nutrition and compromise stroke recovery. The unbalanced gut bacteria could also have negative effects on the recovering brain's function and behavior. "If it ends up being that the gut has an influence on the repair of the brain, maybe our stroke treatments shouldn't just be focused on what we can do for the brain—maybe we need to think about what can we do for the gut," said study author and graduate student Allison Brichacek of the West Virginia University School of Medicine in a statement.

Randy Nelson, Ph.D.
Program Director

Bernard Schreurs, Ph.D.
Associate Program Director

Cassandra George
Program Coordinator

FEATURED STUDENT

Tiffany Petrisko

Tiffany is entering her 6th year and final semester of her Ph.D. studies in the lab of Dr. Gregory Konat. Prior to WVU, Tiffany graduated from Emory University with a B.S. in Neuroscience and Behavioral Biology with honors. Her dissertation work has focused on identifying and understanding immune mediators that are responsible for the induction of cerebral hyperexcitability following peripheral viral infection.

Peripheral viral infections are known to exacerbate the symptoms and enhance the progression of a variety of neurological disorders (e.g., increasing seizure frequency and severity in epileptics or triggering a relapse in multiple sclerosis). If we are able to understand what is happening in the brain to trigger the worsening of these neurological symptoms, then we can create novel therapeutics to allow for clearance of the virus from the body without increasing symptom severity.

"Once we found out that our model induces neuronal hyperexcitability- making it easier for neurons to fire- we wanted to understand what mechanisms were occurring in the brain to cause this," said Tiffany. "My earlier work found the chemokine CXCL10 to be a putative mediator while my most recent work has focused on understanding how CXCL10 could be working through its receptor, CXCR3, to initiate this cerebral hyperexcitability".

Outside of the lab, Tiffany loves to be involved in community service and outreach. Alongside Dr. Liz Engler-Chiurazzi, she helps oversee our departments outreach activities, including our Feed Our Brains program. "While a lot of our programs this past year have focused on elementary to middle age children, we've also been able to connect with Morgantown High School and help out with their AP Psychology classes! While the planning of these activities can mean a lot of extra late nights, the time we spend seeing kids learn and get excited about neuroscience makes it all worthwhile!"

ANNOUNCEMENTS

1) *We welcome new Department of Neuroscience faculty members: Drs. Zachary Weil, Kate Weil, James Walton, and Hunter Zhang.*
2) *The MOBB training grant has been renewed. Meetings of MOBB trainees and faculty will be held Aug. 30th, Sept. 27th, Oct. 25th, and Nov. 22nd from 11:30am – 1:00pm in BMRC 301.*
3) *The 54th Annual Van Liere Research Conference was a huge success! Jessica Cunningham received 1st place for her poster presentation. Congratulations!*
4) *The inaugural 2019 WVU Brain Camp was also an enormous success! Thank you to everyone who contributed.*

Morgantown, WV

OUTREACH

FEED OUR BRAINS

Dr. Elizabeth Engler-Chiurazzi and the Neuroscience graduate and undergraduate students are coupling neuroscience education with strategic philanthropy as a novel approach to engaging in brain awareness outreach and promoting social embeddedness in the local community.

Childhood hunger is a neuroscience-related issue in our state. Malnutrition, resulting in nutritional deficits and inadequate energy supply have detrimental effects on brain development and scholastic performance. Food insecurity is a major issue for many West Virginians; 1 in 5 children live in homes defined as 'food insecure' and ~70% of students qualify for free/reduced school meals (WV Department of Education, 2018). Whereas state law guarantees children are fed in school, the average deficit in unpaid food bills in Monongalia County is ~$40,000/school/year (Engler-Chiurazzi, personal communication), meaning that districts allocate funds away from other resources to meet this requirement. Thus, food insecurity is a significant barrier to academic success among WV children and the high costs paid by local schools to address this issue represent an area for neuroscience-related philanthropic intervention. As such they have developed a novel philanthropic component to their outreach program, "Feed Our Brains".

The philanthropic component of their outreach program was established by developing relationships with local community members committed to addressing childhood hunger. A WVU Foundation account was set up, to which online donations could be directed. They also initiated a T-shirt sales program and forged relationships with local restaurant owners to host benefit dinners in which a percentage of the proceeds supported the "Feed Our Brains" program. Each fundraising effort was promoted in a variety of venues, including WVU internal e-news circulars, social media, online events calendars, and press releases—including an endorsement from WVU President Dr. Gordon Gee.

Since the launch of Feed Our Brains in the Fall of 2018, they have raised >$2250. In May 2019, they made their first charitable donation of $1000 to Monongalia County Schools that accompanied their presentation of their brain awareness curriculum including their newly developed brain nutrition activity, based on the TV show "Chopped," to ~120 5th grade students.

List of Trainee Awards:

Emily Burrage, Jacob Boos, and Ariel Thomas have been appointed as Trainees to the T32 Stroke Training Grant. Congratulations!

Rachel Hostetler and Tyler McGaughey have been appointed as Trainees to the T32 Behavioral and Biological Sciences Training Grant. Mason McCollum has been appointed as an Associate Scholar to the T32 Behavioral and Biological Sciences Training Grant. Congratulations!

ACCOMPLISHMENTS & AWARDS

- *Paul Holcomb*
  - *Successfully **graduated** from the Neuroscience Graduate Program and began his Post-Doctoral fellowship at the University of Pittsburgh.*
- *Tiffany Petrisko*
  - *Publication - **Petrisko TJ**, Konat GW (2019) Peripheral viral challenge exacerbates experimental autoimmune encephalomyelitis. **Met. Brain Dis.** (in press).*
  - ***Poster** - Konat G, **Petrisko T** (2018) Antiviral acute phase response induces neuronal generation of the chemokine CXCL10 in the hippocampus and cortex. **Soc. Neurosci. Prog**. No. 562.15.*
  - ***Poster** - Konat G, **Petrisko T** (2018) Antiviral acute phase response induces neuronal generation of CXCL10 chemokine in the hippocampus and cortex. **Am. Soc. Neurochem. 49th Ann Meet** PS03-12.*
  - ***Conference** – Presented a poster and gave a short talk (both titled "CXCL10-CXCR3 Axis Mediates Induction of Cerebral Hyperexcitability by Peripheral Viral Challenge") at the **Keystone Conference: Neural Environment in Disease: Glial Responses and Neuroinflammation** in Keystone, CO*
- *Anton Sobinov*
  - ***Award** – Winner of the **2018 Neuroscience Graduate Student Research Award**; $500 travel scholarship to attend a conference.*
  - *Successfully **graduated** from the Neuroscience Graduate Program.*
- *Divine Nwafor*
  - ***Poster** – **Nwafor D.C.,*** Gambill, C.A., Brichacek, A.L., Chakraborty S., Benkovic, S.A., Brown, C.M. (2019). Progression of Alzheimer's Disease Associated Memory Loss is Exacerbated in Septic Female Alzheimer's Disease Transgenic Mice. Poster presentation at the Neuroimmune Communication in Health and Disease Gordon Research Seminar and Gordon Research Conference, January 2019, Ventura Beach Marriott, Ventura, CA, USA*
  - ***Poster** – Catheryne Gambill, Allison L. Brichacek, **Divine C. Nwafor**, Aniello Infante, Darren Gemoets, Donald Primerano, Jennifer Franko, Rosana Schafer, Stanley A. Benkovic, and Candice M. Brown. The gut-brain-microbiota axis is altered in aged human nitric oxide synthase 2 (NOS2) transgenic mice compared to aged wild type mice in experimental sepsis. Gordon Conference: Neuroimmune Communication in Health and Disease January 2019 Ventura CA.*

- ***Poster*** *- C.M. Brown,* ***D.C. Nwafor****, A.L. Brichacek, C.A. Gambill, A .Dakhlallah, T. D. Eubank, C.B. Marsh, D. Dakhlallah. (2018). Extracellular vesicles as epigenetic mediators of systemic communication in murine experimental sepsis. American Society for Exosomes and Microvesicles, October 20-24, 2018. Baltimore, MD USA – oral presentation*
- ***Travel Fellowship*** *– Received the* ***2019 AAIC travel fellowship*** *to cover the cost of attending the Alzheimers Association International Conference (AAIC) to give his oral presentation.*
- ***Oral presentation*** *–* ***D.C. Nwafor****, A.L Brichacek, S. Gupta, C.A. Gambill, S.A. Benkovic, C.M. Brown. Polymicrobial infection exacerbates neuroinflammation and worsens Alzheimer's Associated Memory Loss in a Female Alzheimer's Disease Transgenic Mice Model. Accepted for oral presentation at the* ***Alzheimer's Association International Conference****.*

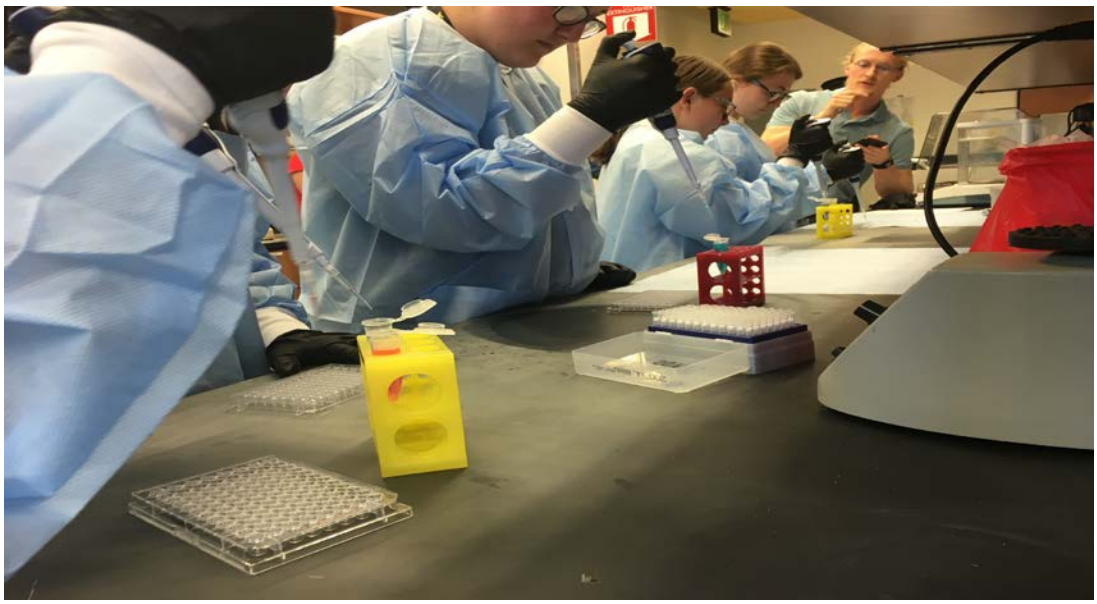
- *Ashley Russell*
  - ***Dissertation Defense*** *– Ashley successfully defended her dissertation research and will begin a post-doc at Johns Hopkins University with Dr. Kenneth Witwer.*
- *Jessica Cunningham*
  - ***Award*** *– 1st place for her category for the Poster Presentation at Van Liere.*
  - ***Award*** *– 1st place for her category for the Poster Presentation at the Appalachian Regional Cell Conference (ARCC).*
- *Catherine Smoot*
  - ***Award –*** *Was chosen to give a flash talk at the ARCC meeting and won second place for the graduate student speakers*
  - ***Travel Award –*** *Was awarded a $500 travel award from Biochemistry for her efforts in helping plan the ARCC meeting.*
- *Dominic Quintana*
  - ***Award*** *– 1st place for his presentation at the 2nd Annual Stroke Symposium.*

NEXT STEPS FOR OUR ALUMNI

Dr. Paul Holcomb has started his postdoctoral studies at the University of Pittsburgh.

Dr. Ashley Russell started her postdoctoral studies at the Johns Hopkins University.

Dr. Anton Sobinov has begun his postdoctoral studies at the University of Chicago.



P.I.C.K. WVU NEUROSCIENCE

Purpose
Innovation
Collaboration
Knowledge