

Program: Tour of Stark Neurosciences Research Institute at IU School of Medicine

Organized by: Jim Bettner

Attendance: 78

Hosts: Bruce Lamb, MD, James Jackson and 4 gracious guides

Scribe: John Michael

Editor: Bill Elliott

On 6/4/2018, a contingent of Sciencetech members made a field trip to see the facilities and hear more about the work done at the Stark Neurosciences Research Facility. We started in the Goodman auditorium with a brief introduction by Dr. Bruce Lamb, who listed several of the topics being studied at Stark, including nerve degenerative diseases such as Alzheimer's disease, traumatic brain injury, addiction, and acute/chronic pain. Next, we were shepherded to another conference room where Dr. Shannon Risacher, an assistant professor of radiology, showed a very entertaining 3D image of the human brain that illustrated the direction of water flow in nerve fiber tracts within the brain. She also discussed two PET scans that revealed, respectfully, beta amyloid plaques and tau protein tangles. She has a particular interest in finding biomarkers that could be used to diagnose Alzheimer's disease in the earliest stages before the onset of dementia and hopefully at a stage that could be treated more effectively with our current therapies.

We separated into smaller groups and were guided into several of the laboratories in the Stark Research Institute. In one of Dr. Lamb's laboratories, we were shown some of the technology used to develop various strains of mice used in Alzheimer's research. Unfortunately we didn't have enough time to understand the functions of most of the "beige boxes" in the lab. We were shown the animal living quarters located on each floor of the institute rather than in the basement. This relatively new juxtaposition of animal living quarters and research labs is apparently being replicated in other newly built research locations.

Dr. Gary Landreth gave us a sobering look at the soaring incidence of Alzheimer's disease in this country and our lack of effective treatments. His most startling information is that 50% of persons over 85 years old have dementia. Our lack of effective treatments reflects our rudimentary knowledge of brain biology.

In Dr. Brady Atwood's laboratory, research on addiction was being performed. He discussed brain connections associated with habitual versus goal-driven behaviors and how these can be affected by certain drugs. We were shown an interesting ongoing experiment in which neurons were being cannulated using microscopic observation.

In Dr. Lahari's laboratory, we were shown how western blot techniques were being used to study proteins from brains of patients with Alzheimer's disease. Attempts are being made to find the effects of various dementia drugs on these protein patterns. Also, deficiency or excess of one or more of these proteins could be a biomarker for pre-dementia Alzheimer's disease detection.

Finally, in another of Dr. Lamb's laboratories, we were told about microglia cells and compact versus diffuse amyloid plaques. Another type of cell, the astrocyte, is also a potential research target in this laboratory. We all returned to the conference room, probably very impressed by the breadth of the techniques used and questions pursued at the Stark Institute. This work will undoubtedly incur

knowledge of the diseased nervous system and may eventually lead to better diagnostic and therapeutic options. If we could convince them to come, these researchers would be excellent choices to give future Sciencetech talks.



Dr. Black



James Jackson