Program: The New Directions for Alzheimer's Disease Research, Drug Discovery, and Treatment
Speaker: Bruce Lamb, PhD, Exec. Dir., Stark Neurosciences Research Institute, IUSM
Sponsored by: Marty Meisenheimer
Attendance: 131
Guests: Mike Kinney, Meg and David Bonner, Tom Eaton, Gerry Bonner, Vim Stohler, Robert Daugherty, Mike Langdon, John Lane, Petra Richie
***Scribe*:** Jim Dashiell
***Editor*:** Bill Elliott

Dr. Lamb was introduced by Paul Crook, a friend and colleague. Dr. Lamb has a degree in molecular biology and came to the Stark Institute from the Cleveland Clinic.

Dr. Lamb's discussion began with a definition of what Alzheimer's disease (AD) actually is; it's character, cause, treatments and the difficulties of studying this disease. Recent significant advances include improvements in brain imaging, the use of biomarkers as diagnostics, and further advances in genetics.

Alzheimer's Disease was once considered rare but now that people are living longer it has become a growing problem, as Age is the #1 risk factor. It is an irreversible, progressive disease that destroys memory and thinking skills. For every five year age group the percentage of people with AD doubles. An estimated 13.8 million people will have AD by 2050. In Indiana 110,000 were diagnosed with AD in 2016, the 14th highest of all states.

Alzheimer's disease was first described in 1906. An average brain has 100 billion neurons. In an affected brain many of these become a tangle of fibrils. There are also beta amyloid, and tau protein plaques throughout the cortex. The contributing factors are many; life style, environment, age and head trauma being a few, but 80% of the patients have a genetic cause.

Treatments include drugs to increase the amount of acetylcholine in the brain, anti-amyloid therapies such as secretase inhibitors and aggregation inhibitors and anti-tau therapies. The failure rate of these treatments is 99,9%.

Difficulties in studying AD include no accurate diagnostic markers, co-morbidities, age related difficulties, etc. This disease is defined by plaques and tangles but it is unknown whether they represent the actual disease itself. Brain changes can start 20-30 years before symptoms present themselves. There are no good animal models to study.

Recent advances in studying AD include a combination of biomarkers such as beta-amyloid and tau found in spinal fluid as well as the possibilities that AD could be an immune based disorder. Locally Lilly has become a pioneer in brain imaging and is participating in many drug trials. Indiana University, through the Stark Neurosciences Research Center, is very involved in many NIH projects. Some of the top clinical trials nationally are going on here. Other areas of focus are Parkinson's Disease, neurodegeneration, traumatic brain/spinal cord injury, addiction, and pain control.

The incidence rates may be dropping due to healthy aging programs. A study in Columbia focused on a genetic mutation as a cause of AD is due to be completed in 2 years. There does not seem to be a relation between AD and autoimmune diseases. Research has also questioned an association between sleeping pill use and the frequency of AD. Amyloid levels, as measured in spinal fluid, change with sleep patterns. Chronic infections might also increase the AD risk. Again, age is the number one risk factor.

Clearly, exercise is known as an aid to delay the onset of AD, and slow its progression. It has been found that sleep patterns also may affect AD risk. The ongoing research of AD continues to develop ideas to actively pursue to develop an effective treatment.

Dr. Lamb