



#### THIS EDITION

Happy Holidays (1)  
2017-2018 Awards (2)  
Research Spotlight (3)  
News (4)  
Contact Information (5)

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## Civitan International Research Center

December 2017



## Happy Holidays!!!

At this time, we want to say how very thankful we are for all the support this past year! With excitement we enter the holidays with a heart of thankfulness for the many blessings we have received. The Civitan International Research Center is fortunate to have your support and we hope you have a wonderful Holiday Season!



Dr. Kristina Visscher captured rare sights on December 8, 2017 when Birmingham was blanketed with a coat of snow!





## 2017-2018 Awards



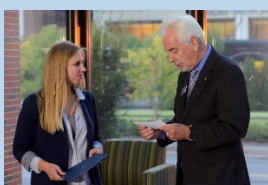
2017 – 2018 Civitan International award recipients were honoured at a reception on October 19, 2017 at the Civitan International Research Center (CIRC). A large crowd attended which included not only faculty from the Research Center but also members of the new Civitan International Board of Directors and representatives from the Foundation for Children with Intellectual and Developmental Disabilities (FCIDD).

Dr. Lucas Pozzo-Miller and Dr. Tika Benveniste spoke briefly about the positive impact Civitan International (CI) has had on the CIRC in the past and the bright future of the CIRC. Other speakers included, John Ryneerson, retired CI Executive Vice President; Linda Hadley, FCIDD; Scarlet Thompson, Civitan International Executive Vice President; and Kendyl Massey, Civitan International President, Board of Directors.

Emerging Scholar awards were granted to Rylie Hightower and Omar Maximo. The W. John Ryneerson Award was given to Mary Phillips and the Whitt Mallory Research Fellow was granted to Nancy Gallus. Dr. Vladimir Parpura received the McNulty Award.



Mary Phillips, Rylie Hightower, Omar Maximo, Nancy Gallus, Dr. Vlad Parpura,  
Dr. Tika Benveniste, Dr. Pozzo-Miller, John Ryneerson



## RESEARCH SPOTLIGHT



Jeremy Herskowitz, Ph.D.

Civitan scientist, Dr. Jeremy Herskowitz and his collaborators were recently published in the *Annals of Neurology* regarding their work on Alzheimer's disease.

### Dendritic spines provide cognitive resilience against Alzheimer's disease

Authors: Benjamin D. Boros, Kelsey M. Greathouse BS, Erik G. Gentry BS, Kendall A. Curtis, Elizabeth L. Birchall BS, Marla Gearing PhD, Jeremy H. Herskowitz PhD

First published: 22 October 2017 [Full publication history](#)

DOI: 10.1002/ana.25049 [View/save citation](#)

Cited by (CrossRef): 0 articles [Check for updates](#)

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#### Abstract

**Objective:** Neuroimaging and other biomarker assays suggest that the pathological processes of Alzheimer's disease (AD) begin years prior to clinical dementia onset. However, some 30 to 50% of older individuals who harbor AD pathology do not become symptomatic in their lifetime. It is hypothesized that such individuals exhibit cognitive resilience that protects against AD dementia. We hypothesized that in cases with AD pathology, structural changes in dendritic spines would distinguish individuals who had or did not have clinical dementia.

**Methods:** We compared dendritic spines within layer II and III pyramidal neuron dendrites in Brodmann area 46 dorsolateral prefrontal cortex using the Golgi–Cox technique in 12 age-matched pathology-free controls, 8 controls with AD pathology (CAD), and 21 AD cases. We used highly optimized methods to trace impregnated dendrites from bright-field microscopy images that enabled accurate 3-dimensional digital reconstruction of dendritic structure for morphologic analyses.

**Results:** Spine density was similar among control and CAD cases but was reduced significantly in AD. Thin and mushroom spines were reduced significantly in AD compared to CAD brains, whereas stubby spine density was decreased significantly in CAD and AD compared to controls. Increased spine extent distinguished CAD cases from controls and AD. Linear regression analysis of all cases indicated that spine density was not associated with neuritic plaque score but did display negative correlation with Braak staging.

**Interpretation:** These observations provide cellular evidence to support the hypothesis that dendritic spine plasticity is a mechanism of cognitive resilience that protects older individuals with AD pathology from developing dementia. *Ann Neurol* 2017;82:602–614

For the complete article visit: <http://onlinelibrary.wiley.com/doi/10.1002/ana.25049/full>

## Neurobiologist Vladimir Parpura named an AAAS Fellow - [by Jeff Hansen](#)

When Vladimir Parpura, M.D., Ph.D., was publishing part of his thesis work in the journal *Nature* more than two decades ago, his adviser said, “You know, Vladimir, this may be the biggest deal you ever do in your life.”

That unprecedented discovery of the astrocyte-neuron glutamate-mediated signaling pathway — work that Parpura has expanded ever since — has now been honored with his election as a 2017 Fellow of the American Association for the Advancement of Science.

Parpura, a professor of neurobiology in the [University of Alabama at Birmingham School of Medicine](#), and 395 other 2017 AAAS Fellows will be presented with blue and gold rosette pins Feb. 17 at the AAAS Annual Meeting in Austin, Texas, to honor their scientifically or socially distinguished efforts to advance science or its applications. Parpura’s election notes his “distinguished contributions to the field of neuroscience, particularly for discovery of gliotransmission.”

Gliotransmission has proved to be important for sleep, respiration, learning and memory, gut motility, and secretion.

Astrocytes, a type of glial cell in the brain, had been thought to merely support brain neurons. Gliotransmission was the discovery of a novel functional role for astrocytes — release of the transmitter glutamate as a signal to adjacent neurons. This astrocyte signaling was subsequently found to modulate synaptic transmission, which led to the concept of the tripartite synapse.

“I congratulate Vlad on his election as an AAAS Fellow,” said John J. Hablitz, Ph.D., professor and interim-chair of neurobiology at UAB. “This is a great honor for him and reflects well on the Neurobiology Department and the entire UAB Neuroscience community.”

Parpura is one of 18 neuroscientists recognized this year as AAAS Fellows.

Parpura, the son of a physician father and attorney mother, grew up in the Dalmatia region of Croatia and received his medical degree from the University of Zagreb. He earned a Ph.D. at Iowa State University and came to UAB from the University of California, Riverside in 2007. Parpura is a member of the Academia Europaea, the Dana Alliance for Brain Initiatives, and the Slovenian Academy of Sciences and Arts, and he currently serves as president of the American Society for Neurochemistry.

Parpura, a rigorous and engaging teacher at UAB at both the undergraduate and graduate levels, calls curiosity the foundation of research.

“If you are not curious, there is no science,” he said. “If there is curiosity, you will be doing science.”

Election as an AAAS Fellow is an honor bestowed upon AAAS members by their peers. The full list of 2017 Fellows will be announced in this Friday’s edition of the journal *Science*. The AAAS is the world’s largest general scientific society and publisher of the journal *Science*, as well as *Science Translational Medicine*, *Science Signaling*, *Science Advances*, *Science Immunology* and *Science Robotics*.

The association was founded in 1848 and includes nearly 250 affiliated societies and academies of science, serving 10 million individuals with a mission to advance science and serve society through initiatives in science policy, international programs, science education and public engagement. The tradition of AAAS Fellows began in 1874.

For updates on the Civitan International Research Center  
visit the website at:  
[www.uab.edu/medicine/circ](http://www.uab.edu/medicine/circ)

**2017 VIDEO NOW AVAILABLE!!!**

Orders for the 2017 Civitan International Research Center video which premiered at the Centennial Convention can be placed by contacting Vicki Hixon at [vhixon@uab.edu](mailto:vhixon@uab.edu). In an effort to offset production costs, an invoice for \$10 will be included in the shipment.

To schedule a private tour of the  
Civitan International Research Center  
Contact Vicki Hixon – [vhixon@uab.edu](mailto:vhixon@uab.edu)

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