Expert in Alzheimer’s Focuses on Women

Funded by $10.3 Million Grant

By Eric Svedlund

A leading expert on Alzheimer’s disease in women, Roberta Diaz Britton started her career at the University of Arizona, yet never expected she’d return.

A heralded neuroscientist with nearly 20 years on the University of Southern California faculty, Britton had earned a host of awards — Woman of the Year by Los Angeles magazine in 2014 for her research into Alzheimer’s disease, the Presidential Citizens Medal by President Barack Obama in 2010; Science Educator of the Year in 2006 by the Society for Neuroscience; and listed by U.S. News & World Report as one of the “Ten Best Minds” in 2005.

But a new opportunity as inaugural director of the UA Center for Innovation in Brain Science brought Britton back to Tucson, where she’ll lead creative translational research efforts to finally solve the challenges posed by Alzheimer’s and other neurodegenerative diseases.

Britton returned to the UA in May and by October had secured a $10.3 million, five-year grant from the National Institute on Aging at the National Institutes of Health. Britton’s research had already been continuously funded by the NIH for 20 years.

“In the 21st century, there’s not a single cure for a single neurodegenerative disease,” Britton said. “Our center’s mission is to bring the innovative brain science of the future to those who need a cure today. Part of that is approaching the problem differently. I use the phrase ‘all brains on deck.’ It’s clearly a complex biology challenge and it’s going to take many brains thinking collaboratively to solve it.”

Alzheimer’s disease strikes women more frequently than men. Of the more than 5 million Americans of all ages with Alzheimer’s disease in 2016, more than 3 million were women. By age 65, women have a one-in-six chance of developing Alzheimer’s, compared to a one-in-11 chance for men. Britton’s research centers on understanding how the aging female brain can account for those differences.

“I devote a very large part of my research program to understanding what is occurring in the female brain as the brain ages and what is creating this vulnerability, this greater lifetime risk of developing Alzheimer’s disease,” she said.

Both men and women with neurodegenerative diseases — like Alzheimer’s, Parkinson’s and multiple sclerosis — tend to be treated the same. Many of the symptoms are the same, but the biology is different. Britton describes it with an analogy that speaks to her years in Los Angeles.

Neurodegenerative diseases are described as progressive, meaning they start at a point long before diagnosis, around 20 years in the case of Alzheimer’s.

“The pathology freeway is the same, but the on-ramps is different,” she said.

“How one begins that process is exactly where the interventions need to target.”

With the average age of Alzheimer’s diagnosis in women being in the mid-70s, Britton focused her research on biological transformations in the brain that occur during perimenopause, a neuroendocrine transition unique to women.

“It’s an aging transition that can be uneventful for some and very eventful for others,” she said. “In women with severe symptoms, the complaints are neurological — like hot flashes, insomnia and depression. Endocrine transitions can be these tipping points, where these vulnerabilities emerge.”

Britton’s research interest stems directly from formative experiences in her past. When she started college at the UA, she had a job in the pediatric clinic and was inspired by the doctors and nurses around her. Taking classes at night, she finished her undergraduate degree in two years and went on to earn a doctorate at the UA in neuropharmacology and psychobiology.

As a post-doctorate in neuroendocrinology at Rockefeller University, she was asked by a physician to observe a clinical trial of Alzheimer’s patients.

continued on page 42 >>>

Robertita Diaz Britton
Inaugural Director of Center for Innovation in Brain Science
University of Arizona
Expert in Alzheimer’s Focuses on Women

Funded by $10.3 Million Grant

By Eric Swedlund

A leading expert on Alzheimer’s disease in women, Roberta Diaz Brinton started her career at the University of Arizona, yet never expected she’d return.

A heralded neuroscientist with nearly 20 years on the University of Southern California faculty, Brinton had earned a host of awards — Woman of the Year by Los Angeles magazine in 2014 for her research into Alzheimer’s disease; the Presidential Citizens Medal by President Barack Obama in 2016; Science Educator of the Year in 2006 by the Society for Neuroscience; and listed by U.S. News & World Report as one of the “Ten Best Minds” in 2005.

But a new opportunity as inaugural director of the UA Center for Innovation in Brain Science brought Brinton back to Tucson, where she’ll lead creative translational research efforts to finally solve the challenges posed by Alzheimer’s and other neurodegenerative diseases.

Brinton returned to the UA in May and by October had secured a $10.3 million, five-year grant from the National Institute on Aging at the National Institutes of Health. Brinton’s research had already been continuously funded by the NIH for 20 years.

“In the 21st century, there’s not a single cure for a single neurodegenerative disease,” Brinton said. “Our center’s mission is to bring the innovative brain science of the future to those who need a cure today. Part of that is approaching the problem differently. I use the phrase ‘all brains on deck.’ It’s clearly a complex biology challenge and it’s going to take many brains thinking collaboratively to solve it.”

Alzheimer’s disease strikes women more frequently than men. Of the more than 5 million Americans of all ages with Alzheimer’s disease in 2016, more than 5 million were women. By age 65, women have a one-in-six chance of developing Alzheimer’s, compared to a one-in-11 chance for men. Brinton’s research centers on understanding how the aging female brain can account for these differences.

“I devote a very large part of my research program to understanding what is occurring in the female brain as the brain ages and what is creating this vulnerability, this greater lifetime risk of developing Alzheimer’s disease,” she said.

Both men and women with neurodegenerative diseases — like Alzheimer’s, Parkinson’s and multiple sclerosis — tend to be treated the same. Many of the symptoms are the same, but the biology is different. Brinton describes it as an analogy that speaks to her years in Los Angeles.

Neurodegenerative diseases are described as progressive, meaning they start at a point long before diagnosis, around 20 years in the case of Alzheimer’s.

“The pathology starts the same, but the on-ramp is different,” she said. “How one begins that process is exactly where the interventions need to target.”

With the average age of Alzheimer’s diagnosis in women being in the mid-70s, Brinton focused her research on biological transformations in the brain that occur during perimenopause, a neuroendocrine transition unique to women.

“It’s an aging transition that can be uneventful for some and very eventful for others,” she said. “In women with severe symptoms, the complaints are neurological — like hot flashes, insomnia and depression. Endocrine transition can be these tipping points, where these vulnerabilities emerge.”

Brinton’s research interest stems directly from formative experiences in her past. When she started college at the UA, she had a job in the pediatric clinic and was inspired by the doctors and nurses around her. Taking classes at night, she finished her undergraduate degree in two years and went on to earn a doctorate at the UA in neuropharmacology and psychobiology.

As a post-doctorate in neuroendocrinology at Rockefeller University, she was asked by a physician to observe a clinical trial of Alzheimer’s patients.

continued on page 42 >>>
"For the Center for Innovation in Brain Science, instead of going from bench to bedside, we’re going from bedside to bench. We start with the human condition and work our way to the discovery environment."

- Roberta Diaz Brinton
Inaugural Director of Center for Innovation in Brain Science
University of Arizona

continued from page 40

She spent a lot of time with a particular patient who changed the direction of Brinton's career. "She could not remember me for 30 seconds and I've remembered her for 30 years," she said.

Brinton's new grant at the UA builds on a paper she published two years ago about detecting potential Alzheimer's-related changes that occur during menopause. Brinton found that on an integrated set of biomarkers that target the metabolic system, she and her research team could detect women who were already experiencing mild cognitive deficits. The changes were subtle, still in normal range, but on the edge of normal.

"The goal is to detect women who are at greater risk before they cross over and work to bring them back to normal," Brinton said.

In returning to the UA, Brinton praised the university's "boldness to think and to act and to take on the challenges of the 21st century."

"I see that across everyone I encounter here," she said. "The University of Arizona has unique advantages in the ability to reach across diverse disciplines, within the science sphere, within the business sphere, within the behavioral and social science sphere. It's big enough to have the intellectual critical mass and small enough to be a family, where connections can be made in real time with real people. That is an edge that many larger metropolises don't have."

"We have the capacity to create innovative teams that include scientists and business people to go from the inception of an idea to the distribution of the outcome. We can really start with the end in mind," she said. "For the Center for Innovation in Brain Science, instead of going from bench to bedside, we’re going from bedside to bench. We start with the human condition and work our way to the discovery environment."