



# Donna Rose Addis

NZASE  
scientist  
profile

## Field of science

**Cognitive neuroscience** - Neuroimaging, neuropsychology, memory.

## Born where and when

Mangere East, Auckland, 1977. Samoan/Pālagi.

## School

Aorere College, South Auckland; head girl and dux in 1995.

## How she got into science

"I was always interested in the world around me. I caught insects, was obsessed with shells and fascinated by the beauty of nature. I was always curious and tried to understand how things worked.

I hadn't thought of going to university, but I won a scholarship. I studied Psychology to fill a gap in my Arts degree, and enjoyed learning how the brain works - it's complex and fascinating. I had a personal interest in identity. With a mixed cultural background I grappled with ethnic and class identity - I looked Pālagi but I felt Samoan."

## Her training and jobs

**Bachelor of Arts & MA** in History and Psychology at the University of Auckland.

**PhD** in Psychology, University of Toronto.

**Post-doctoral Fellowship** at Harvard University in Boston. "It was a challenge to be away from home, I was reminded of my ancestors - voyagers who left their homes and families to better their lives."

**Professor and leader of the Memory Lab** at the University of Auckland School of Psychology, 2008-2018.

**Senior Scientist**, Rotman Research Institute, Toronto, Canada from 2018.

## What topics she studied

- How the loss of personal memories in Alzheimer's Disease affects our sense of self (Masters Degree).
- Activation of the hippocampus to see how this small part of the brain files fragments of memory, and what happens when the hippocampus is damaged in epilepsy (PhD).
- How memory is linked to the ability to imagine the future, and the brain networks underlying imagination and creativity (Postdoctoral fellowship).



## How she finds things out

- **Neuroimaging: Magnetic Resonance Imaging** (MRI, using magnetic fields, magnetic gradients and radio waves to create images of the brain), and **magnetoencephalography** (MEG, recording magnetic fields produced by electrical currents in the brain), to create pictures of the brain's activity when we're thinking of particular topics.
- **Behavioural experiments** to measure different aspects of thinking, to understand the processes involved, such as using memory to simulate future events.



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- **Examining mental abilities** in people with brain damage from stroke, or brain diseases such as dementia, to see what parts of the brain are used in different types of thinking and how they deteriorate.

## Most valuable results

- 1 The hippocampus becomes more active when people are imagining future events than when they are attempting to remember.
- 2 Our hippocampus is part of a whole-brain network helping us find memories from our lives. This brain network is active whenever we are day-dreaming, and helps us use memory to imagine and think creatively.
- 3 The impact of memory loss on the ability to imagine our future, for people with Alzheimer's Disease and depression.
- 4 The memories we form when we are 15 to 25 are critical to our sense of identity. When people with dementia lose those memories, their knowledge of who they are declines.

## What she likes about science

- “Being useful to my community and having an impact,” including on mental health in Pacific communities.
- Working with other scientists around the world - “I have a family of international scientists”.
- “Taking little steps, chipping away at a problem every day. Then you look back and you’ve done huge project.”
- “Finding a satisfying niche for myself.”
- “Mentoring school students; helping them find what science they want to do, and do it the best they can.”

## Links

- **Donna in Memory, Explained** in a series called *The Mind, Explained* on YouTube and Netflix.
- **E-Tangata interview.**
- **Winning the Prime Minister's Emerging Scientist Prize** in 2010.
- **Interview on Brain Breakers.**
- **Coconut TV video** (6m).

### PAST EVENTS



### FUTURE EVENTS



*Different parts of our brains activate when we remember the past and imagine the future.*



*Donna with Canadian Prime Minister Pierre Trudeau when she was awarded a Canada 150 Research Chair in 2018, one of 24 created to bring top*

*researchers to Canada during the 150th anniversary of confederation. She got \$4m in funding over seven years.*

## Ngā Kupu

**Wairoro** - Brain

**Mate roro** - Brain damage

**Whakangakongako whakāro** - Brain pattern diagram

**Hokinga mahara** - Memories

**Whakamahara** - To remember

**Autō** - Magnet, magnetic

**Whaitua autō** - Magnetic field

*From Te Aka Maori Dictionary*



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