

PLAYING THE INNOVATION GAME





Would you be surprised to learn that not flossing your teeth could increase your risk of developing dementia?

This is one of the lesser-known facts that players of a game of Snakes and Ladders for a Healthy Brain can discover. The game, developed by Professor Jessica Teeling (Biological Sciences) and Dr Sofia Michopoulou (Head of Nuclear Medicine Physics, University Hospital Southampton), uses play to improve public understanding of dementia risk factors.

Snakes and ladders

Around 1million people in the UK live with dementia, with this figure expected to rise to 1.6million by 2050. As we age, our risk of developing the condition increases. But, Jessica explained, “The recent landmark Lancet Commission report into dementia prevention, intervention, and care (Jill Livingston et al) showed that more than 45% of the risk factors for dementia are modifiable. That means you can do something about it.”

Nearly half of all dementia cases worldwide could be prevented or delayed by addressing risk factors such as smoking, high blood pressure, poor diet and inactivity. Many of the risk factors involve activation of our immune system which is consistent with scientists’ growing knowledge of the links between inflammation and dementia.

As Professor of Experimental Neuroimmunology, Jessica’s own research focuses on the role of the immune system in the onset and progression of neurodegenerative disease. Her research group investigates the contribution of bacterial infections, the oral and gut microbiome, and inflammation to conditions including Alzheimer’s and Parkinson’s disease.

The snakes and ladders game, complete with three-metre-by-three-metre board and giant foam dice, was designed to teach people about lifestyle choices that prevent (ladder) or increase (snake) the risk of dementia. As they play, a game host explains why certain factors accelerate the development of dementia, and the role played by the immune system in this process. Each player takes home a postcard-sized version of the game, with further information.

The team has taken the game to science and humanities festivals, dementia cafés and training events, Southampton’s Pride and Mela events, Eastleigh’s Unwrapped festival, and the Romsey Dementia Festival. The activity is also part of the Public Engagement with Research unit’s roadshow. The project was recognised with a Vice-Chancellor’s Award for Knowledge Exchange in 2023.

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Professor Jessica Teeling



Pin badges at Southampton Pride

“It’s a real attractor at public events,” said Jessica. “It’s very helpful for starting conversations.”

Evaluation following these events showed that 80% of participants changed their perception of the risk factors for dementia. The ones which most surprised people were, not flossing teeth, and hearing loss, both topics of research at the University.

Public engagement highlighted barriers in some communities, both to talking about dementia, and to taking part in some of the activities, such as exercise, that can help reduce the risk.

“At the Mela festival [which celebrates Southampton’s South Asian community], we had some wonderful conversations with younger participants, but it was harder to talk to some of the older people about dementia; you could see their unease,” commented Jessica.

“We particularly want to take the game to underrepresented communities such as the Asian, Black African and Caribbean communities, because they are at higher risk of developing dementia,” she said.

From awareness to action

Armed with this learning, the team agreed that follow-up was needed to turn awareness into action. Commercialisation Manager Chris Buckingham from the University’s Research and Innovation Services (RIS) suggested that commercialisation could help to make the project financially sustainable.

Jessica applied for the ARC Launch programme, which supports researchers from the social sciences, arts and humanities to develop entrepreneurial skills and test their ideas. As a biological scientist, the programme helped her to take a creative approach to developing follow-up activities, and to identify stakeholders and audiences.

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Professor Jessica Teeling

Having already shared the game with partners and the public, the team made the follow-up activities the focus for commercialisation and are exploring options aimed at people in mid-life. “It’s about raising awareness of these risk factors at a stage of your life where you can contribute to better brain health,” Jessica explained.

The commercial route “may be through a social enterprise, or by working with a charity to provide support, tools and educational materials based on our research,” she said. Ideas range from creating a series of exercise videos, to activities such as cooking classes to explain how the gut biome contributes to the risk of developing dementia. “We also want to bring in those elements of gamification, because we know that it breaks down barriers.”

The team is working with Southampton Voluntary Services, charities, and public health

experts, on ways to use the game and other resources to raise awareness of dementia risk factors. They are also exploring how to engage with healthcare providers and GPs.

Enterprising approach

This is not the first time that Jessica has taken the commercial route to translate her research into practical applications.

Following her PhD, she was part of a team at biotech company, Genmab, that developed a monoclonal antibody all the way from research to approval by the U.S. Food and Drug Administration. “As an academic, that’s been very helpful in terms of seeing the big picture,” commented Jessica.

Working with the Technology Transfer and Intellectual Property team in RIS, Jessica has recently prepared a patent application on engineered antibodies for the safe treatment of Alzheimer’s Disease.

Her enterprise capability feeds directly into student education. The School of Biological Sciences introduced a Bioscience and Business module at undergraduate level, something which has been well-received by employers. Taught by Jessica, students develop transferable skills and learn about the commercialisation process, and how to recognise commercial opportunities.

Researchers should start thinking about these opportunities early, said Jessica. “If you’ve found something interesting or innovative, disclose it as soon as possible; RIS can help you to identify if it’s truly innovative. If you’ve published, or talked about it at a conference, you may be too late to apply for a patent, because your work is in the public domain.”

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Professor Jessica Teeling and PhD student Juwairiyah Shazzad at the Southampton Arts and Humanities Festival 2024