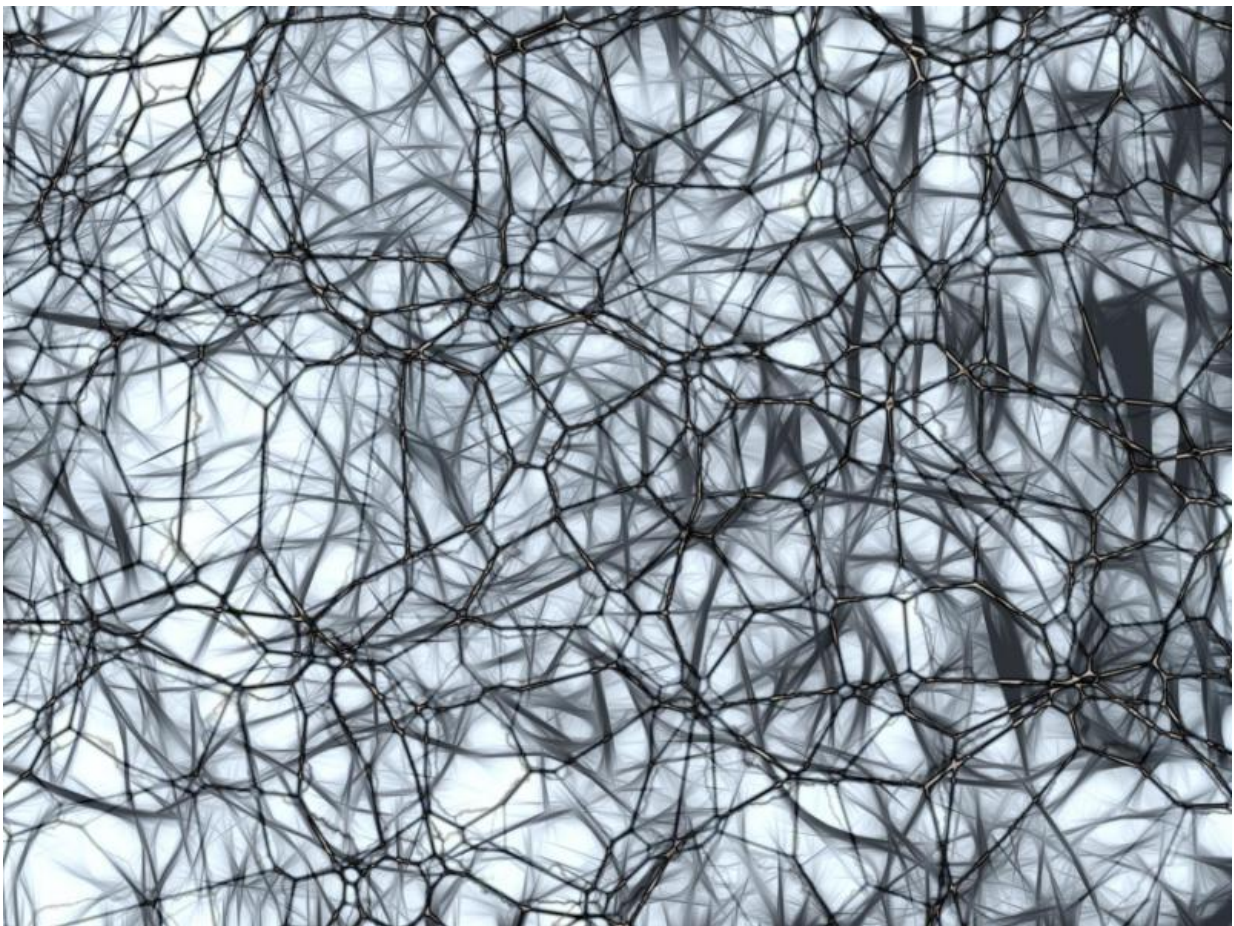


# Tool to measure brain blood flow identifies tell-tale signs of dementia and Alzheimer's early

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Credit: COST

A network of over 200 scientists, clinicians and industry partners developed a cost-effective diagnostic tool for measuring the tell-tale signs of dementia and Alzheimer's. The tool uses a new, non-invasive technique to measure blood flow to the brain, known as Arterial Spin Labelling (ASL). The network set a reference for the best possible way of measuring blood flow, allowing all researchers using ASL in neurodegeneration to compare the network's results. The three main vendors of MRI machines – GE Healthcare, Siemens Healthcare, and Philips Healthcare – have already taken up the tool. A company spinning out of the network has raised £1.1 million from the UK's National Health Service to improve the calibration of ASL devices in order to ensure consistent and reliable results.

Dementia is a major brain disease associated with [memory loss](#), personality changes and confusion. It can rob people of their independence and cause profound distress for individuals and their families.

The condition also represents a significant economic burden. Caring for people affected by dementia accounts for around 1 percent of global GDP. In Europe, where the number of people aged over 65 is growing, the impact of neurodegenerative diseases could rise.

While the pharmaceutical industry continues to work on therapies that could stem the progression of the illness, imaging experts are developing technologies that can diagnose dementia – even before patients notice classic symptoms such as memory loss .

MRI machines can show anatomical changes in the brain, such as the loss of dying neurones due to Alzheimer's disease. A technique, known as Arterial Spin Labelling (ASL) , offers something new: a non-invasive way to measure blood flow to the brain.

By magnetising blood in major arteries and following its path to the brain, experts can deduce whether brain cells are being nourished with the oxygen and glucose they need to survive. Low rates of [blood flow](#) – known as perfusion – to neuronal cells suggests something may be wrong.

COST Action BM1103 brought together a network of over 200 scientists and clinicians, working alongside industry partners, to develop this cost-effective diagnostic tool that uses the ASL technique. The key was to provide researchers and clinicians with a reliable and comparable way to measure the tell-tale signs of dementia .

"After 15 years of developing ASL around the world, there were a plethora of methodologies and techniques," says Professor Xavier Golay of University College London. "It was a nightmare for anyone who wanted to work in this field because they did not know where to start or how to achieve the best results ."

Through a COST-funded meeting in Amsterdam in October 2012, members of the COST Action joined forces to find the best possible method to measure perfusion , based on a thorough analysis of the literature. This led to a paper aimed at people working in this area. It was finally published in January 2015 and has become a reference for scientists in the field .

"It has really changed the field, reshaping it in amazing way," says Professor Golay. "This allows all of us using ASL in neurodegeneration to compare our results and it has even been taken up by the three main vendors of MRI machines – GE Healthcare, Siemens Healthcare, and Philips Healthcare. In terms of impact this is huge."

As another outcome of the Action, Professor Golay's spin-out company– Gold Standard Phantoms Limited –has raised £1.1 million from the UK's

National Health Service to improve the calibration of ASL devices in order to ensure consistent and reliable results.

Members of this Action are working with the Quantitative Imaging Biomarkers Alliance (QIBA) to have ASL recognised globally as a biomarker for dementia , and members continue to collaborate through the ASL Network.

Provided by COST

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