

Professor Nick Fox

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Scientific background

My first degree was in Natural Sciences from Cambridge where I studied physics and physiology. After a short period of working I went back and studied medicine at the University of London (St. Thomas' Hospital). My junior hospital posts (first general medicine and then neurology) were all in and around London. I then specialised in neurology, cognitive disorders and [dementia](#). My research was initially into the use of imaging to improve diagnosis in [Alzheimer's disease](#).



Why dementia research?

I had always been interested in science at school and at university. I had considered doing a Physics PhD but felt that I would be better suited to something that was more directly involved with people. I also thought (aged 21) that three years of research seemed an impossibly long time - amazing considering that I have now been fairly continuously involved in research since 1993! Within medicine, I found neurology interesting and was fortunate to work for a neurologist (Martin Rossor) with an interest in [dementia](#). He encouraged me to specialise in neurology and to do a research project on dementia. He suggested that that my physics background might be relevant for a Fellowship proposal on imaging that he was putting together to submit to Alzheimer's Society.

We were duly awarded the [Fellowship](#) and so I began research on the use of magnetic resonance imaging (brain scans) to detect changes in individuals at risk of [Alzheimer's disease](#) because of their family history.

Current research interests

My current research interests are focused on improving diagnosis and finding treatments for [Alzheimer's disease](#) and related dementias. A particular interest has been on the use of imaging to detect early changes in these diseases and also to use imaging as a means of assessing whether or not therapies are actually slowing disease progression. My experience and expertise owes much to the original [Alzheimer's Society Fellowship](#) that I was awarded. That proposal aimed to measure a particular brain structure, the hippocampus, (known to be involved in memory) in [Alzheimer's disease](#).

The project involved scanning people annually and trying to measure any changes. The problem was that everyone goes into the scanner in a very slightly different position or orientation on each occasion. This means that the scans are never quite aligned and so it was very difficult to be sure with such a complex brain structure, whether or not there was change. It was hard to be sure one was outlining exactly the same region or structure on each scan. A major step for me was the idea that if one could only use a computer to first realign the second scan so that it was in exactly the same position and orientation as the first scan, then one would be much more able to assess change accurately.

I was fortunate to work with a very able physics PhD student at Imperial and together we managed to design a method of getting computers to do exactly that: to match (overlay) a second scan onto the first so that one could see and measure changes that had occurred over time between the two scans. In this way we could measure the loss of brain cells due to the disease. This has remained an interest of mine and the method has proved to be useful not just in detecting early change but also for measuring the effects of treatments. The approach has been widely adopted for use in drug trials in dementia and other neurological disorders. The particular techniques that followed from the [Society's Fellowship](#) have now been used by different research groups in over 20 international [clinical trials](#). Although this remains a major research interest of mine I am also interested in other (non-imaging) markers that may help us understand [dementia](#) and improve clinical care.

My research is closely aligned with my clinical practice. Here at the National Hospital for Neurology we particularly get referred patients with [young onset](#) or difficult to diagnose [dementia](#). My research (and clinical) interests remain to improve diagnosis and care of people with dementia.

Why Alzheimer's Society?

My first involvement with the Society was through my [clinical research Fellowship](#) which started in 1993. During the four years of my Fellowship I was invited to give talks at dozens of local Society branches. At each one I learnt from the Society's members and repeatedly felt humbled and impressed by the carers I met. I have continued to be involved with the Society because I think the Society and organisations like it can do much to inform (and push) government policy.

I also believe that the Society can and should be an important driver and supporter of research. Involving patients and their families in research is critical to progress; clinical research is all about learning from patients and carers and only if patients support what researchers are trying to do will they so generously continue to participate - clinical research absolutely depends on that.

Alzheimer's Society National Dementia Helpline

England, Wales and Northern Ireland: 0300 222 11 22

9.00am-5.00pm Monday-Friday

10.00am-4.00pm Saturday-Sunday

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