This year has seen further progress in understanding dementia and in approaches to treating the condition and its symptoms. However, there have also been setbacks in the search for treatments, which emphasise the need for further work and funding.

The failure of dimebon in final stage clinical trials for people with Alzheimer’s disease was a huge disappointment. This compound had appeared very promising, and the absence of any benefit in final stage trials was a serious blow.

Several other high profile unsuccessful clinical trials in the last few years have triggered serious reflections about the best way to maximise the benefits of future trials. Due to the current financial climate, there are now only a very small number of final stage clinical trials supported by pharmaceutical companies. Although there are promising treatments such as Alzheimer’s vaccines still being evaluated, it has become clear that charities, research councils and academic institutions cannot just leave the development of new drugs to the pharmaceutical companies.

For disease-modifying therapies, clinical trials have focused on a relatively late stage of the Alzheimer’s disease process and it is thought that the chances of success would be improved by targeting people in the very earliest stages of the condition. However, there has been some excellent progress in this area of research, with new blood biomarkers for Alzheimer’s disease, such as the protein clusterin, being identified.

There have been some major developments in the treatment of behavioural and psychiatric symptoms in people with dementia, which affect more than 90 per cent of people with dementia at some time during their illness. Developing safe and effective treatments for these symptoms is a huge priority, and has been highlighted as one of the most important areas for research by the Ministerial Advisory Group for Dementia Research.

Antipsychotics have a small but significant impact in improving symptoms but they significantly increase the rate of decline and increase the chances of stroke and death. The Department of Health has recently launched a major national initiative to reduce unnecessary use of these drugs. However, there still needs to be a big emphasis on gaining a better understanding of how and why behavioural and psychiatric symptoms occur in people with dementia, and developing safer and more effective treatments.

Dementia research is at a promising juncture. We know an increasing amount about the biology of different types of dementia and we have an ever better understanding of treatment targets, which should enable us to develop more effective treatments. However, significantly more research investment is needed to be able to develop these and take them forward to clinical trials. We cannot rely upon pharmaceutical companies to do this – we must seize the initiative and drive these programmes forward.
The profile of Alzheimer’s Society’s Research programme has increased tremendously since its inception in 1990 and it continues to go from strength to strength. This year we funded more research than ever before, our Research Network continues to flourish, and we have played an important role in increasing investment in dementia research across the UK. Research is a major priority for the Society. This was emphasised when the Board of Trustees committed to increase our annual investment in research to at least £5 million by 2014.

A key highlight from our research programme this year was an exciting new research funding partnership with the BUPA Foundation, which meant that together we were able to invest £1.5 million in new project grants.

We are committed to supporting the development of crucial research as well as building a strong community of dementia researchers. To further this goal we funded another £859,000 in fellowships and PhD studentships, supporting the leading researchers of the future.

It has been encouraging to see some of our existing research moving forwards, including the first clinical trial to test prevention of the development of dementia after stroke, which we are co-funding with the Stroke Association.

This year, our co-funded brain banking initiative Brains for Dementia Research added the Bristol brain bank to its portfolio.

This will enable the group to reach more potential donors in the south west regions and provide more high quality brain tissue to dementia researchers in the UK and around the world.

This year, we hit the road with a series of roadshows to inform local communities about dementia research and the opportunities we provide for people with dementia, carers and former carers to engage with our research programme. We invited local researchers to talk about their research and local Research Network volunteers talked about their role and what they get from volunteering. Staff were also on hand to answer questions about almost everything pertaining to dementia. The roadshows were very successful and have enabled us to recruit many new Research Network volunteers and spread the word about our research in different parts of the country.

This is an exciting time for dementia research and the Society has positioned itself as a key player in the fight to increase investment. Our own research programme is growing to meet the demands of research in the UK and we are excited about the challenges and opportunities this will bring. It is particularly satisfying to see our Research Network grow in numbers and activity, enabling the volunteers to use their experience to influence the direction of research, both within the Society and further afield.
News from the Research Network

Summary of the year’s activities

April 2010 to March 2011 saw an increase in overall Research Network activity. The 175 Research Network volunteers reviewed a record total of 94 applications and helped to approve 45 applications for shortlisting, with 17 going on to receive funding. Research Network membership saw a small rise, and the number of active members rose as a result of a membership audit. Friends of Research membership saw another year of strong growth, rising from 244 to 425.

Many Network volunteers have also taken part in additional diverse activities on behalf of the Society and people living with dementia. These have included sitting on national and international advisory groups for research and presenting at conferences. Many volunteers have continued to monitor ongoing projects, reporting to the Society on the progress of research and providing a link between researchers and users.

Over the year, there has been a focus on re-launching the Research Network, improving procedures and communications, and increasing the number of volunteers. As part of this, the Research Network Area Co-ordinators group elected its first chair, Tricia Best, who has done a fantastic job so far.

One theme of the last year has been an increase in workshops and focus groups on a variety of topics, such as end of life, assistive technologies, medicine management and immunotherapies. These workshops have brought researchers together with Network volunteers to discuss potential research applications to improve their relevance, quality and chances of being funded.

Research Network volunteers have also contributed to policy consultations that have informed Alzheimer’s Society’s responses to government papers.

Network involvement in the Ministerial Advisory Group on Dementia Research

The Ministerial Advisory Group on Dementia Research (MAGDR) was convened to maintain the momentum begun by the 2009 Dementia Research Summit and develop a vision for the future of dementia research.

Chaired by the Minister for Care Services, Paul Burstow, MAGDR consists of high level representatives from the Department of Health, charities, funding bodies and parliamentarians. Over the past year, Alzheimer’s Society staff and Research Network volunteers have played an active role in developing a headline report and a Route map for dementia research, which was published in the summer of 2011.

Alzheimer’s Society Director of Research Professor Clive Ballard and Research Network volunteer Barbara Woodward-Carlton were members of the MAGDR full group that met directly with the minister. As the only lay member of the group, Barbara used her first-hand experience of being a carer for her mother to encourage an immediate focus on dementia research. In addition, there were five working sub-groups on the themes of: prioritising the agenda; engaging the public; increasing funding; better ways of working together; and translating research into practice.

A Research Network focus group held in August 2010 helped to inform what priorities Alzheimer’s Society should advocate through our presence on MAGDR groups. These included registers for people with dementia who are interested in taking part in research, overcoming barriers to undertaking research in care homes, and the importance of an early and accurate diagnosis.

In January 2011, the National Institute for Health Research (NIHR) announced a call for dementia research, an outcome that is likely to result in a greatly increased amount of clinical research into dementia in 2012. With other positive outcomes in the Route map, there appears to be a refreshing new emphasis on improving and increasing dementia research.
Uncovering the molecular mechanism of the amyloid cascade: p53 as a central component
Dr Richard Killick, King’s College London

Synaptic dysfunction as a basis for cognitive decline and behavioural symptoms in dementia with Lewy bodies: Molecular mechanisms and novel therapeutic targets
Professor Paul Francis, King’s College London

Care of nursing home residents with advanced dementia
Dr Carole Parsons, Queen’s University Belfast

The role of picalm in amyloid-beta clearance
Dr Shabnam Baig, University of Bristol (funded by Credit Suisse)

Do inflammatory mechanisms cause Alzheimer’s disease following brain injury?
Dr Jill Fowler, University of Edinburgh (extension of previous fellowship grant)

Evidence synthesis of trajectories of cognitive change due to chronological age, death and preclinical dementia
Dr Graciela Muniz-Terrera, University of Cambridge

Astrocyte regulation of neuronal function: Analysing their contribution to oxidative and metabolic stress in neurodegeneration
Professor Michael Ashford, University of Dundee

Improving memory in amnestic MCI and Alzheimer’s disease via minimal interference
Professor Sergio Della Sala, University of Edinburgh

An electrophysiological and computational analysis of hippocampal synaptic changes in the Alzheimer’s disease mouse in vivo
Dr John Gigg, University of Manchester

T-cell responsiveness to amyloid-beta peptides and variants resulting from post-translational modifications: An integrated analysis of T-cell receptor and Toll-like-receptor engagement
Professor Florian Kern, University of Sussex

Evidence synthesis of trajectories of cognitive change due to chronological age, death and preclinical dementia
Dr Graciela Muniz-Terrera, University of Cambridge

Building stakeholder knowledge of how to improve dementia care in general hospitals
Dr Bart Sheehan, University of Warwick
Two research grants funded in 2010–2011

Synaptic dysfunction as a basis for cognitive decline and behavioural symptoms in dementia with Lewy bodies: Molecular mechanisms and novel therapeutic targets
Project grant: Professor Paul Francis, King’s College London
(co-funded by the Bupa Foundation)

People with dementia with Lewy bodies often experience severe psychiatric symptoms such as hallucinations and delusions. They also react very badly to the standard drug treatments for these behavioural symptoms. Scientists believe that the clumps of protein that form in nerve cells cause disruption of the important chemical messengers that cells use to communicate. However, the mechanism for this is not yet clear.

Professor Paul Francis is investigating the biochemistry of dementia with Lewy bodies. This research involves using biochemical and cellular techniques to analyse the events occurring in nerve cells during the disease.

The research will provide important information about this lesser-known form of dementia. Professor Francis hopes that this better understanding of the biology of the dementia will help in the development of better treatments in the future.

The role of PICALM in amyloid-beta clearance
Credit Suisse Fellowship: Dr Shabnam Baig, University of Bristol

The gene for the protein PICALM was recently identified as a risk factor for late-onset Alzheimer’s disease. Previous research has shown that PICALM is increased in people with Alzheimer’s disease. It has also been shown that it is involved in a crucial process called endocytosis, the process by which proteins gain entry into cells, which is likely to be important in the removal of amyloid-beta from the brain.

Dr Baig has been awarded a research fellowship to investigate how PICALM affects the amount of amyloid-beta found in blood vessels in the brain and the surrounding brain tissue. Dr Baig will measure the amount of PICALM and amyloid-beta in cells taken from blood vessels and grown in the laboratory and will also compare levels of these proteins in brain tissue from people with and without Alzheimer’s disease.

This work will help us understand more about how amyloid-beta is removed from the brain. It will also determine whether PICALM plays an active role in the process. Depending on the outcome, this research could identify exciting new targets for drug treatments in the future.
Research completed 2010–2011

Project grants

Early and accurate diagnosis of Alzheimer’s disease by measuring proteins in blood
Dr Elizabeth Mukaetova-Ladinska, University of Newcastle

Wnt and insulin signalling in the ageing brain: Improving fruit-fly models, translating to human studies
Professor Linda Partridge, University College London

An evaluation of potential therapies to inhibit cerebral emboli in dementia
Professor Charles McCollum, University of Manchester

Antibodies to amyloid precursor protein – a novel therapy for Alzheimer’s disease?
Dr Emma Kidd, University of Cardiff

PhD studentships

Investigation into the role of amyloid-beta ‘soluble oligomers’ in the generation of hydrogen peroxide in Alzheimer’s disease
Professor David Allsop, University of Lancaster

A pre-clinical investigation of minocycline as a potential therapeutic agent for the treatment of Alzheimer’s disease
Dr Diane Hanger and Dr Wendy Noble, King’s College London

Fellowships

Promoting person-centred primary care for people with dementia: The development and testing of a psychosocial educational intervention in primary care
Dr Sarah Voss, Avon and Wiltshire Mental Health Partnership

An evaluation of user involvement in a research-funding programme
Professor Sandy Oliver, University of London

Dissemination grant

Managing together: Helping families to manage the impact of Alzheimer’s disease and related dementias upon the relationship between grandparents and their grandchildren
Professor Sarah Harper, University of Oxford

Fundraising for research

In the financial year 2010–2011, £2.5 million was raised towards all areas of the Society’s research. Donations were secured from charitable trusts, companies, individuals and legacies.

£565,767 was secured from trusts and statutory organisations. These key supporters include the Hartley Charitable Trust, the Robert Luff Foundation Ltd and The Henry Smith Charity who contributed £238,400 between them.

Thank you to all our individual supporters who have made donations towards our research. We are grateful to Mrs Lynne Tully and Mrs Julie Hill who donated £1,000 towards research into dementia and Alzheimer’s disease in memory of their father, the Hunt family who have given £3,000 for research into vascular dementia and the Scott family who gave the Society almost £3,700.

We are also grateful to Credit Suisse who, through our Charity of the Year partnership, raised £278,854 for the research programme.

Thanks to all those who have made contributions to our dementia research through gifts in their wills. We have raised over £1.4 million through 25 legacies in the last year.

Without this support we would not be able to invest in so many high quality projects and researchers. We are extremely grateful to all the people and organisations who give so generously towards the Society’s research programme.
An evaluation of potential therapies to inhibit cerebral emboli in dementia

**Project grant:** Professor Charles McCollum, University of Manchester

The causes of common dementias such as Alzheimer’s disease and vascular dementia remain uncertain. Professor Charles McCollum’s group previously found that both Alzheimer’s disease and vascular dementia are associated with small particles (emboli) in the circulation to the brain and that patients with these emboli suffer a more rapid progression of dementia. Prior to major clinical trials on whether therapy to inhibit emboli may prevent or treat dementia, we need to study possible therapies that may inhibit these emboli.

In a clinical trial, the researchers compared two possible drugs, platelet inhibitor Clopidogrel (which may stop small clot formation) and a statin, called Atorvastatin, which lowers cholesterol and stabilises arterial disease.

The number of emboli in the cerebral circulation was measured by non-invasive ultrasound. Assessment of brain function and markers of inflammation associated with dementia were measured before and after one month of each trial treatment. Most studies were done at the patient’s home, a suggestion welcomed by carers and patients alike.

The most important result from the trial is that both Clopidogrel and Atorvastatin were effective in reducing the number of emboli (clots/tiny particles) in the circulation to the brain. These treatments could provide a way of preventing progression of dementia in those at highest risk.

A pre-clinical investigation of minocycline as a potential therapeutic agent for the treatment of Alzheimer’s disease

**PhD studentship:** Dr Diane Hanger and Dr Wendy Noble, King’s College London

The antibiotic minocycline is typically used for the treatment of skin conditions such as acne. More recently, minocycline has been shown to protect the brain from the damaging processes that occur during the development of Alzheimer’s disease, although it is still unclear exactly how it works.

Along with neurons, astrocytes are one of the main types of cell in the brain. As well as providing support to neurons, we now know that astrocytes contribute to inflammation in the brain, releasing a number of chemicals as part of the body’s first line of defence. In an Alzheimer’s disease brain, an inappropriate inflammatory response might cause the condition to develop and/or progress. It appears that astrocytes play a key role in the toxic effects of the amyloid-beta protein, which forms plaques in the brains of people with Alzheimer’s disease.

PhD student Claire Garwood grew astrocytes in the laboratory and exposed them to amyloid-beta, which caused them to change shape and release inflammatory chemicals. These chemicals affect another protein called tau, which forms ‘tangles’, another hallmark of the disease. When Claire treated astrocytes with the antibiotic minocycline before they came into contact with amyloid-beta, they did not change shape or release inflammatory chemicals.

The results of this study help to explain how astrocytes contribute to the events that occur in Alzheimer’s disease, and identifies them as a potential target for new drugs.
Research in the press

Dementia research continued to make the headlines in 2010–2011 and Alzheimer’s Society was never too far away from the big stories. Thanks to our strong standing and reputation, journalists always want to hear what we have to say, so the Press team were kept busy drafting statements, briefing spokespeople and arranging interviews.

No fewer than 88 statements were sent out in the last financial year, helping us to secure an impressive 425 pieces of research related coverage mentioning Alzheimer’s Society. This included numerous appearances on the BBC and in big name national newspapers such as the Daily Mail, Telegraph and Daily Express. In total our comments reached a staggering 436 million people, helping to increase awareness and understanding of research and the important role of Alzheimer’s Society.

Policy and research

The year from April 2010 to March 2011 saw big upheavals in public policy. The general election in May 2010 delivered a coalition government. They have proposed new legislation in health, launched a review of the funding of social care and suggested sweeping changes to the way that public services operate. In particular, the health and social care bill suggests a greater emphasis on public health, and closer integration of health and social care services, both of which could improve the lives of people with dementia if they become a reality.

The government also demonstrated their interest in dementia research from the outset, pledging in the coalition agreement to prioritise research funding for dementia. Despite many areas of cuts announced in the spending review in October, there was a commitment to increase health research spending in real terms. The government has also continued working with the Ministerial Advisory Group on Dementia Research (MAGDR), which had been set up in 2009 to drive forward UK dementia research by increasing the volume, quality and impact of dementia research.

In January, Care Services Minister Paul Burstow announced that the National Institute for Health Research would be prioritising dementia research and researchers were encouraged to put in high quality bids for funding. The minister commented, ‘The Department of Health’s research budget is nearly a billion this year – I want more of that funding to be supporting dementia research.’ Dr Sorensen, Head of Research at Alzheimer’s Society said, ‘Dementia research is desperately underfunded so it is encouraging to hear that bids for dementia researchers will be prioritised.’

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