Professor Karen Morrison MA, BM ChB, FRCP, DPhil

Bloomer Professor of Neurology

Neurobiology

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About

Karen Morrison is Bloomer Professor of Neurology and combines basic and clinical research with teaching and clinical neurology.

She leads a laboratory group investigating molecular genetic mechanisms in the neurodegenerative disorders of motor neurone disease, MND, and Parkinson's disease. A key role has been in establishing very large DNA banks from patients with MND and Parkinson's disease, linked with longitudinal clinical data, the samples from which are used widely in national and international studies.

She directs the Birmingham MND Care and Research Centre at the Queen Elizabeth Hospital Birmingham, caring for patients with MND and with specific interests in familial forms of the disease and in clinical trials.

She teaches on the topics of neurology and genetics on various courses throughout the College, and is passionate about public engagement, with frequent talks to lay groups, schools and patient charities.

Qualifications

- FRCP Royal College of Physicians, London 2002
- DPhil Clinical Medicine University of Oxford 1993
- BM ChB Medicine University of Oxford 1986
- BA Medical Sciences Tripos University of Cambridge 1983

Biography

Karen Morrison undertook medical training first at the University of Cambridge (Open Entrance Scholarship, 1980, Girton College), and then at Oxford (Magdalen College), qualifying in 1986 and being awarded the George Pickering Prize for top student in the year. Following junior medical jobs in Oxford and London in 1988 she went to the Department of Internal Medicine at Yale University USA, undertaking post doctoral research with Professor Steve Reeders. There she cloned the Goodpasture antigen, one of the first ever antigenic targets to pathogenic antibodies in human disease to be cloned. (Whilst there she also tested prototypes of the first automated thermal cycler machines to be used for the now standard technique of the polymerase chain reaction, PCR).

She returned to Oxford (Magdalen College) in 1990, undertaking an MRC Training Fellowship, with Professors Kay Davies and John Newsom-Davis as supervisors, leading to the award in 1993 of a DPhil for molecular genetic studies in the childhood onset motor neurone disorder of spinal muscular atrophy. A Wellcome Trust Career Development Fellowship allowed her to continue laboratory research, which expanded to encompass molecular genetic studies in motor neurone disease, amyotrophic lateral sclerosis, MND/ALS, the most common motor nerve disorder of adults. During this time she was appointed as Medical Research Fellow at Corpus Christi College, and completed her clinical training in neurology at the Radcliffe Infirmary, being appointed Honorary Consultant Neurologist in 1998.

She moved to the Bloomer Chair of Neurology at the University of Birmingham in 1999, when she was also appointed as Honorary Consultant Neurologist at the University Hospitals Birmingham NHS Foundation Trust. Since then she has combined basic and clinical research in neurodegenerative disease with teaching and clinical work. She directs the Birmingham Motor Neurone Disease Care and Research Centre at the University of Birmingham and Queen Elizabeth Hospital Birmingham. The main focus of her work is in care of people with the currently incurable disorder of MND/ALS alongside research into best clinical management, studies of novel therapeutic interventions and basic molecular genetic studies into mechanisms in the disease to help develop effective treatments.

Karen enjoys teaching neurology to undergraduates, emphasising how basic science is of relevance to clinical practice, talking about research and medicine to lay groups and in engaging with young people about the excitement of careers in medicine and medical research.

Teaching

- MB ChB course – neuroscience, neurology and clinical genetics.
- Bedside and outpatient clinical teaching of neurology to MB ChB students.
- Lecturer and project supervision of BMedSc third year students.
- Lecturing on Good Brain, Bad Brain module.
- Lecturing to physiotherapy students.
- Lead for neurology sessions in Mini Medical School lecture series.
- Supervisor of Special Study Modules in neurology, MB ChB course.
- Examining of MB ChB students –preclinical and clinical

Postgraduate supervision

PhD supervision – molecular genetic studies in neurodegeneration; clinical research in motor neurone disease, parkinson's disease and palliative care

Research

Molecular and genetic studies in neurodegeneration – particular focus on motor neurone disease/amyotrophic lateral sclerosis and Parkinson's disease. Investigation of both sporadic and familial disease, genome wide association studies, investigations of glutamate excitotoxicity.

Establishing large DNA banks from people with various neurodegenerative diseases, linked to longitudinally collected clinical and epidemiological data. These include the UK MND Biobank (collaborative with Sheffield and King's London, funded by the MND Association UK,) PD GEN DNA Bank (samples from all over UK, funded via MRC and Parkinson's UK and linked to PD MED and PD SURG, large pragmatic clinical trials run by the University of Birmingham) and banks of samples from people with the parkinson's related disorders of progressive supranuclear palsy and multiple system atrophy (NNIPPS UK DNA bank). These samples have been used and are available for further use in collaborative research nationally and internationally. Work to date has included several genome wide association studies (see publications) including studies of copy number variation and homozygosity mapping.

Clinical research in motor neurone disease with interests in therapeutic clinical trials, standards of care and end-of-life decision making. Karen is UK Chief Investigator of the first phase I clinical trial of a novel compound to treat MND to be run in the UK in the last 20 years and principal investigator for several other phase III trials, both academic led and commercial

Other activities

Karen is involved in several local and national organisations representing neurology and neurodegenerative disease. She is the lead for Neurodegeneration and Neurological Disease in the Birmingham and Black Country Comprehensive Local Research Network (CLRN) of the Department of Health. She is an active member of the National Specialty Group of the CLRN for Neurological Disease and of the Department of Health Dementia and Neurodegenerative Diseases Research Network (DeNDRoN) Clinical Studies Group in Motor Neurone Disease. She is chairperson of the Association of British Neurologists Special Interest Group in MND.

She has been a member of both the clinical and research advisory panels of the Motor Neurone Disease Association UK and has advised on the national committee developing best practice for 'Standards of Care' in MND. She is a regular speaker at national symposia for patients and health care professionals organised by the MND Association UK. She is currently a member of the Research Advisory Panel of Parkinson's UK. She is a Trustee of the Midlands Neuroscience Teaching and Training Fund.

She is recognised internationally for work on motor neurone disease. She is the UK representative on the European ALS Task force, developing guidelines for best practice in the disease and member of the World Federation of Neurology ALS Group and European ALS consortium. She has recently been an international representative on the genetics committee of the US NINDS panel, advising on data collection for DNA banking in MND/ALS. She has been a member, and subsequently chairperson, of the International Review Panel for the Irish Research Council of Science Education and Technology Postdoctoral Fellowship scheme in Biological Sciences since 2006. She has served on the editorial boards of the international journals 'Neuromuscular Disorders' and 'Journal of Neurology' , and is currently on the editorial board of 'Neurodegenerative Disease Management'.

Publications

International Parkinson Disease Genomics Consortium (University of Birmingham UK members: Karen E. Morrison, Carl E. Clarke, Catriona Moorby, Joanne Stockton). Imputation of sequence variants for identification of genetic risks for parkinson's disease: a meta-analysis of genome-wide association studies. **Lancet**, published online February 2, 2011.

The UK Parkinson's Disease Consortium and The Wellcome Trust Case Control Consortium 2 (Karen E. Morrison and Carl E Clarke members of UK Parkinson's Disease Consortium). Dissection of the genetics of parkinson's disease identifies an additional association 5' of SNCA and multiple associated haplotypes at 17q21. **Human Molecular Genetics** 20: 345- 353. 2011.

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J Kirby, EF Goodall, W Smith, JR Highley, R Masanzu, JA Hartley, R Hibberd, HC Hollinger, SB Wharton, KE Morrison, PG Ince, CJ McDermott, PJ Shaw. Broad clinical phenotypes associated with TARDNA binding protein (*TARDBP*) mutations in amyotrophic lateral sclerosis. **Neurogenetics**. 11:217-225. 2010.

S Rollinson, P Rizzu, S Sikkink, M Bake , N Halliwell, J Snowden, BJ Traynor, D Ruano, N Cairns, JD Rohrer, S Mead, J Collinge, M Rossor, E Akay, R Guerreiro, R Rademakers,KE Morrison, P Pastor, E Alonso, P Martinez-Lage, N Graff-Radford,D Neary, P Heutink, DMA Mann, J Van Swieten, SM Pickering-Brown. Ubiquitin Associated Protein 1 is a risk factor for frontotemporal lobar degeneration, **Neurobiology of Aging,** 30:656-65. 2009

Expertise

Motor neurone disease, MND – clinical and genetic aspects; molecular biology; assisted suicide and end of life decision-making; Parkinson's disease – genetic aspects, molecular biology; clinical neurology; Alzheimer's disease – genetic (inherited) and environmental causes; diagnostic methods and treatment strategies

Alternative contact number available for this expert: **contact the press office (http://www.birmingham.ac.uk/news/contacts/index.aspx)**