

# Academic Directorate of Neuroscience Research Performance and Strategy Document 2015

Academic Director: Prof. Dame Pamela Shaw

Clinical Director: Dr Richard Grunewald

Research Coordinator: Ms Jodie Keyworth



## EXECUTIVE SUMMARY

**Clinical Director - Dr Richard Grunewald; Academic Director - Professor Dame Pamela Shaw; Research Coordinator - Ms Jodie**

### **Keyworth**

Sheffield is a leading national centre for neurological disease research with strengths in the fields of neurodegeneration, cerebrovascular disease, neuro-inflammation, epilepsy, functional neurology, neurophysiology and clinical trials. Sheffield Neuroscience investigators have a strong track record for attracting key sponsors; for recruiting patients into clinical research studies and delivering studies to target and on time. We have had major roles within topic specific networks *e.g.* Stroke and DeNDRoN and good relationships and support from the South Yorkshire Comprehensive Research Network and now the Yorkshire and Humber CRN. We have established a pathway of translational research from basic neuroscience through to phase 3 clinical trials in patients in some areas of Neuroscience. Sheffield has an excellent collaborative environment for interdisciplinary research between clinicians and basic scientists, together with researchers from health services research, public health, engineering, psychology, biomedical science and bioinformatics.

### **Main research themes**

There are 7 main research themes each with a theme leader: **Neurodegeneration** – Prof. Oliver Bandmann; **Neuroinflammation** – Prof. Marios Hadjivassiliou; **Cerebrovascular disease** – Prof. Arshad Majid; **Epilepsy** – Prof. Markus Reuber; **Clinical Trials- Industry Liaison** – Prof. Basil Sharrack; **Neurophysiology** – Dr Ptolemy Sarrigiannis; **Neurosurgery** – Mr John Yianni.

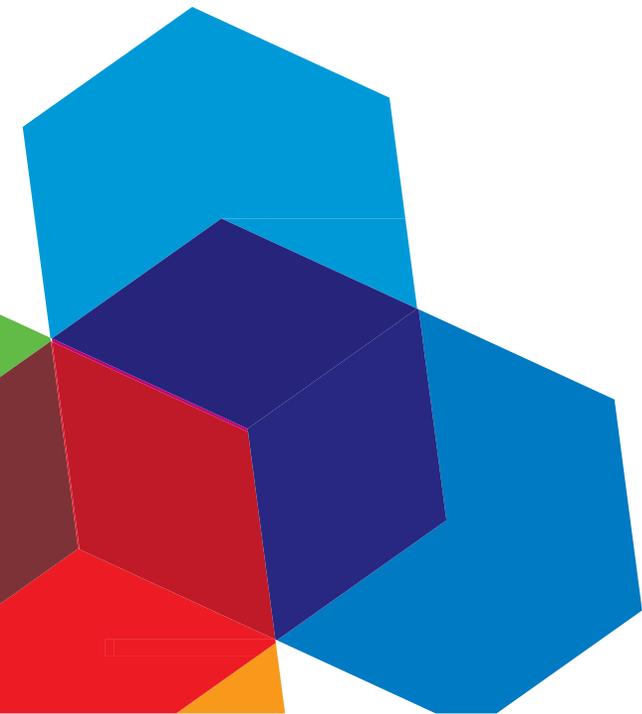
### **Vision**

Our **vision** is to create strong internationally competitive research groups within Clinical Neuroscience, with excellent collaborative links between Trust and University researchers, to ensure that we are placed in a strong position to attract research funding and have a positive impact on the care of patients with neurological disorders.

### **Patient and public involvement (PPI) and media engagement**

We have a vibrant programme of PPI involvement in our research, particularly in the areas of neurodegeneration (MND, Parkinson's disease, dementia), ataxia, cerebrovascular disease and epilepsy, with plans to develop this further during 2015.

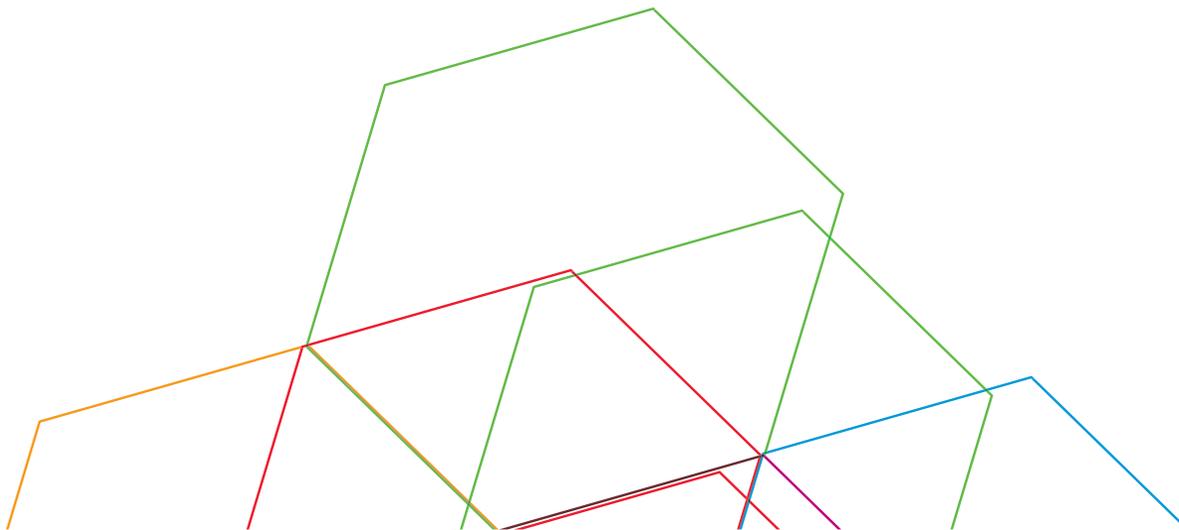
Our research is regularly the subject of media articles, with more than 10 aspects of our research highlighted in the media during the last 12 months.



## Key objectives for the next 12 months

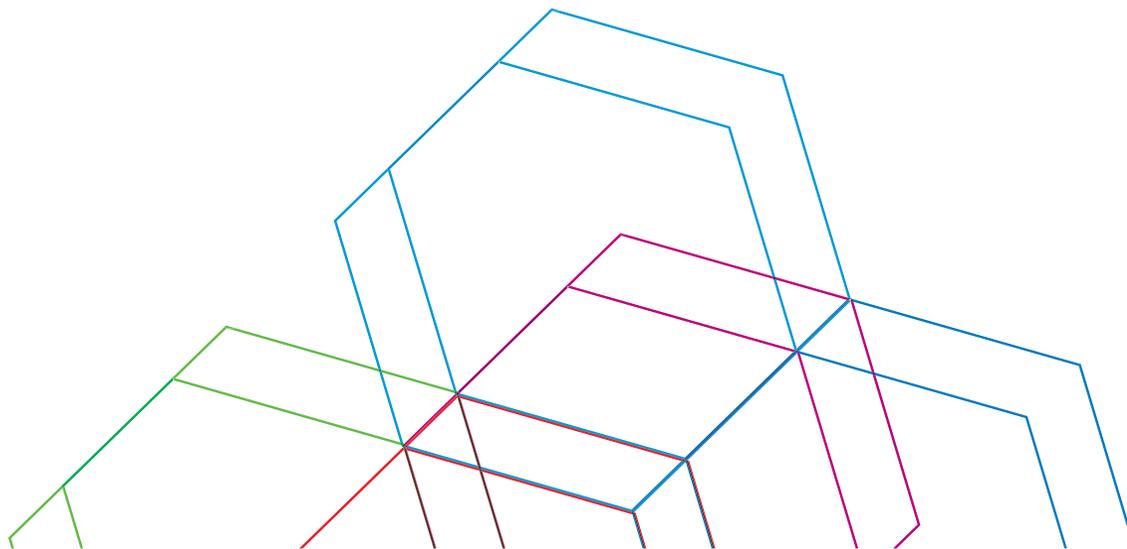
Our annual research plan incorporates 12 measurable objectives, informed by our 2014 SWOT analysis, which include the following main elements:

- Building our research capacity and critical mass in key areas of strategic priority including dementia, epilepsy and movements disorders.
- Continuing to increase manpower, infrastructure and financial support for our research priorities.
- Demonstrating continuing improvements in research performance metrics, the impact of our research in terms of benefits for patients with neurological disorders, and development of partnerships with the pharmaceutical industry.
- To keep clinical neuroscience research, as well as clinical service, at the cutting edge internationally, we would like to explore the opportunity to establish MRI-PET imaging in Sheffield.



# 1. INTRODUCTION

- Sheffield is a leading national centre for neurological disease research with strengths in the fields of neurodegeneration, cerebrovascular disease, neuro-inflammation, epilepsy, functional neurology, neurophysiology and clinical trials. Sheffield Neuroscience investigators have a strong track record of attracting key sponsors; of recruiting patients into clinical research studies and delivering studies to target and on time. We have a good relationship and support from the Yorkshire and Humber Clinical Research Network
- Sheffield has an excellent collaborative environment for interdisciplinary research between clinicians and basic scientists, together with researchers from health services research, public health (SchARR and CHLARC), engineering, psychology, biomedical science and bioinformatics. Interaction with the University of Sheffield's newly formed Institute for in Silico Medicine (INSIGNEO) provides a unique platform for the continuing application of computation modelling to all aspects of clinical neuroscience research.
- Our **vision** is to create strong internationally competitive research groups within Clinical Neuroscience, with excellent collaborative links between Trust and University researchers, to ensure that we are placed in a strong position to attract research funding and have a positive impact on the care of patients with neurological disorders.



## 2. ACHIEVEMENTS SINCE THE CREATION OF THE ACADEMIC DIRECTORATE OF NEUROSCIENCE IN 2011

### 2.1 Developing and implementing academic strategy

- Following the appointment of the Academic Director (Prof. Pamela Shaw) and some management time to support research (Ms Carolyn Wilkie), Management and Executive meeting structures have been changed to place a stronger emphasis on research and teaching and a more integrated approach to research and service delivery. Regular monthly meetings of the Directorate Research and Teaching Committee take place, reporting to the Directorate Executive through the Academic Director. We invested in a talented Research Coordinator (Ms Jodie Keyworth) who has been instrumental in supporting the research strategy and delivery.
- Initially we identified our areas of strength and potential as 6 research themes, each with an appointed theme leader. These research leaders stimulate research development within their themes and put together annual strategic plans. We have recently refined our theme to merge Neuro-Oncology with Neurosurgery and to develop the new theme of Neurophysiology (see Table 1).
- To ensure delivery on our strategy we set up a robust process for collating data on research activity including: numbers of research active personnel; portfolio of research studies (commercial and non-commercial portfolio and non-portfolio studies); accrual figures; research funding; publications (including establishing “My Publications” across the Directorate); impact and esteem indicators and capacity development. These data are reviewed on a regular basis so that problems can be identified and addressed.

### 2.2 Setting up appropriate management and communications structures

- We developed a productive working relationships with the **Clinical Research Office** (CRO) through a member of staff who had responsibility for the Neuroscience portfolio (Ram Patel and Sam Heaton), with staff in the **Clinical Research Facility** at the RHH site and with key personnel within the **South Yorkshire CLRN** and now the **Yorkshire and Humber CRN**. Members of these organisations are regular invitees to our Directorate R&T Committee.
- We contribute regularly to the Trust Research Newsletter and are in regular touch with the Trust Press office through Claudia Blake.
- We issue a quarterly newsletter which highlights research successes and to engage staff across the Directorate in our research effort.
- We will be working with the CRO in 2015 to update the Neurosciences Research website to ensure it is more user friendly and facilitates patient involvement in clinical research.
- In 2015 we plan to have research pages on the TV displays in outpatient clinics to highlight our research to patients and the public.

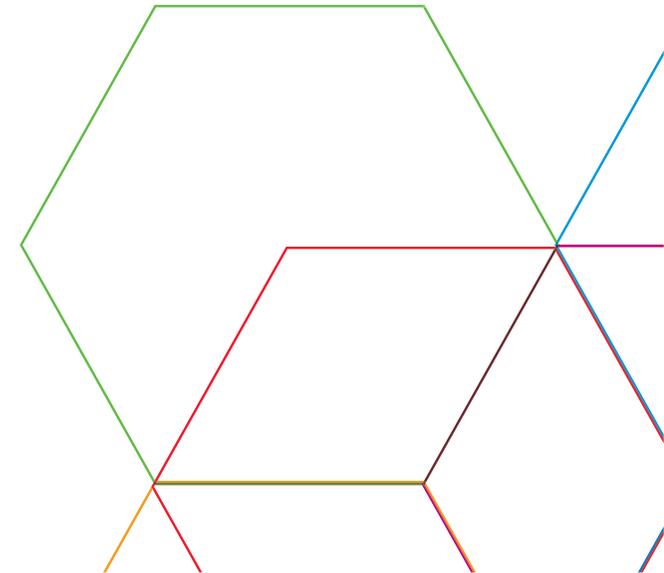
## 2. ACHIEVEMENTS SINCE THE CREATION OF THE ACADEMIC DIRECTORATE OF NEUROSCIENCE IN 2011....

### 2.3 Development of transparent financial structures to support the research strategy.

- We have worked with our Directorate Finance Manager (Mr Andy Lowe) and with the Research Finance team (Julie Patchett and Ian Brown) to develop a transparent process for the management of research income that flows into the Academic Directorate of Neuroscience e.g. through accrual of patients into portfolio studies, RCF monies and overhead funding from NIHR grant awards and commercial studies. The income and expenditure are reviewed on a regular basis by the R&T Committee and strategic use of these funds is agreed e.g. to support research PAs for clinicians, research nurses, administrative support for research etc. We have worked closely with the Research Finance Team in the development and modelling of Trust policies for the distribution of commercial income and excess treatment costs.

### 2.4 Continued improvement of performance metrics – research income, research projects and accrual, publications

- We have made significant progress and improvements in most of the NIHR key research performance indicators (KPIs). We have increased accrual of patients to portfolio studies by 50% and to commercial studies by 77% in the last 3 years. Eighty percent of our portfolio studies and 88% of our commercial studies have recruited on time and to target. In terms of research funding, the Academic Directorate of Neuroscience currently attracts 24% of the research income and 39% of the commercial income generated within the Trust.



## 2. ACHIEVEMENTS SINCE THE CREATION OF THE ACADEMIC DIRECTORATE OF NEUROSCIENCE IN 2011....

### 2.5. Research manpower capacity building and supporting the career development of our research active staff

- **Senior staff appointments to build critical mass in key strategic areas**

Working with both the Trust and the University and supported by Sheffield Hospitals Charitable Trust, we have formulated and implemented plans for addressing gaps in our research skills and critical mass.

- **Encouraging research in our NHS consultant work force**

- We have established an annual system to allow applications for research PA time from consultants across the Directorate. The R&T Committee also review annual reports to ensure that research PAs are used appropriately to enhance high quality research within the Directorate and to encourage external funding applications. This policy has allowed us to increase research capacity in the key strategic areas of dementia, neurophysiology and neurodegeneration.

- New consultant appointments have an opportunity to bid for research PAs if the appointees can show a good track record of research achievement and submit a coherent research plan which fits with the research strategy of the Trust and the Directorate. This policy has allowed the last 3 new consultant appointments in Neurology to effectively apply for research PA time. A recently appointed consultant neurosurgeon will also be making an application for research PAs. In addition we have been able to support the dementia, stroke and neurophysiology themes with research PA time for key researchers.

- **Attracting and developing the careers of high quality research fellows and trainees.**

We continue to attract high quality trainees into our Directorate and we nurture the development of our clinical and science based junior researchers *e.g.* with prestigious fellowship awards. Since 2011 – we have attracted several high quality **NIHR Academic Clinical Fellows** (Wong, Lo, Bell); **NIHR Clinical Lecturers** (Jenkins, Redgrave, Blackburn, Alix, Cooper-Knock). Several young researchers have obtained **prestigious external fellowships**: (Cooper-Knock MRC Clinical Training Fellowship; Hobson NIHR Clinical Training Fellowship; Ferraiuolo EU Marie Curie Fellowship; Mortiboys Parkinson's UK Senior Fellowship; Mead MND Kenneth Snowman MND Association Lectureship in Translational Neuroscience; McNeill INSIGNEO Neuroscience fellowship).

## 2. ACHIEVEMENTS SINCE THE CREATION OF THE ACADEMIC DIRECTORATE OF NEUROSCIENCE IN 2011....

### 2.6 Effective stimulation of new research projects and collaborations

- **Research Forum Programme** - We initiated a programme to stimulate new research and collaborations, bringing together interested parties from the NHS and the University sectors, with a series of half-day research forums. The first in June 2011 was on dementia and others that have taken place include stroke, neuro-inflammation, epilepsy, movement disorders, neuroscience and engineering, neurorehabilitation.
- **MSc programmes** - In the last four years we have developed three taught PGT courses (Translational Neuroscience; Clinical Neurology, Translational Pathology [Neuroscience]) and will deliver a new a course in Genome Medicine in 2015. These courses currently attract ~50 students per year from UK, EU and overseas. Members of the Academic Directorate are involved in supervising the 5 month research projects of these students. This is an opportunity to obtain data supporting publications and external funding applications. The Academic Directorate of Neuroscience will derive benefit from the recent success of the University of Sheffield in terms of post-graduate student experience as evidenced by winning four 2014 Times Higher Education Awards for Student Experience, Widening Participation Initiative of the Year, Outstanding International Student Strategy, and Outstanding Support for Early Career Researchers.
- **Engagement of research charities to pump prime research projects** - We have engaged the support of two local charities, the Ryder Briggs Trust and Neurocare, to provide “ pump priming “ funding to support research in key strategic areas to increase the likely success of future external grant applications. Two annual rounds of applications have occurred to date, with applications being scored and prioritised by the Directorate R&T committee. £93,000 has been committed to this scheme to date by the two charities.
- **Research advisory clinic** - We have established a research advisory clinic to help new researchers develop the permissions needed to initiate new studies.

## 2. ACHIEVEMENTS SINCE THE CREATION OF THE ACADEMIC DIRECTORATE OF NEUROSCIENCE IN 2011....

### 2.6 Translational impact of our research effort – positive impact on patient care and prospects for improved outcomes for patients

Below are examples of translational research achievements in Neuroscience led by Sheffield investigators:

a) **Non-invasive ventilation produces substantial improvements in survival and quality of life in patients with motor neurone disease (MND).** Investigators: Shaw, McDermott.

b) **Improvements in other aspects of symptom management and biomarkers in motor neuron disease.** Investigators: McDermott, Shaw, Jenkins, Alix, Rao, Sarrigiannis, Wilkinson, Hoggard.

c) **Effective gene therapy approaches in models of neurodegeneration and planned first into man (phase 1) trials.** Investigators: Azzouz, Ning, Mead, Grierson, Shaw.

d) **Utilisation of gene expression profiling and characterization of mitochondrial function and morphology to identify therapeutic targets and biomarkers of disease subtypes in neurodegeneration.**

Investigators: Bandmann, Mortiboys, Flinn, Shaw, Kirby, Heath, Ferraiuolo, Ramesh, Grierson, de Vos, Mead, Higginbottom.

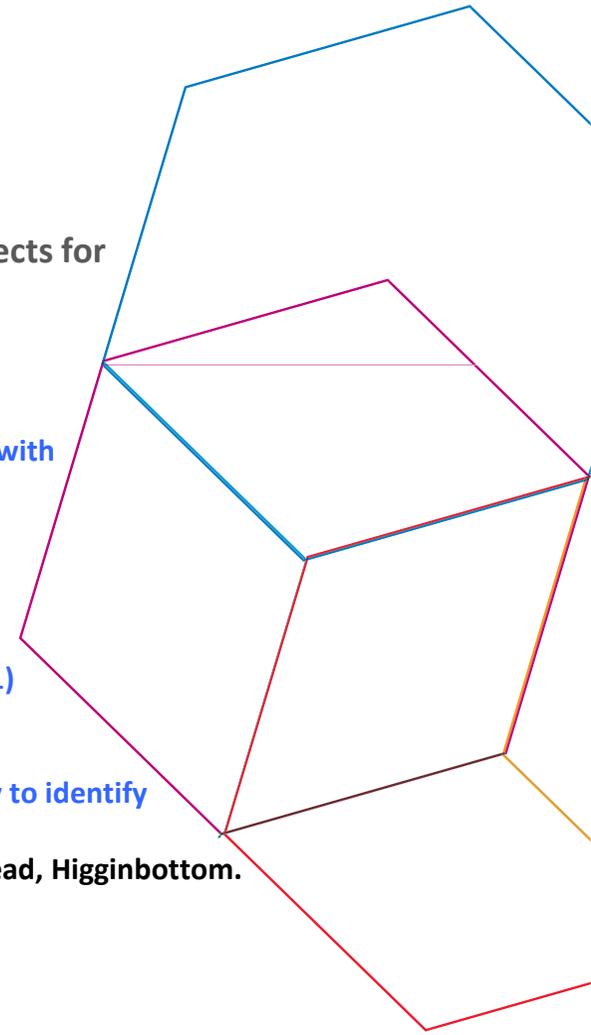
e) **Clinical research on Parkinson's disease and Huntington's disease.** Investigator: Bandmann.

f) **Clinical and genetic aspects of Wilson's Disease.** Investigator: Bandmann.

g) **Pathogenesis of brain ageing and its relationship to dementia.** Investigators: Ince, Wharton, Highley, Simpson, Shaw, Kirby, Heath, Blackburn, Venneri.

h) **Differential diagnosis of the dementias.**

Investigators: Venneri, Shanks, Harkness, Blackburn, Woodruff, Wilkinson, Frangi, Ince, Highley



## 2.6 Translational impact of our research effort – positive impact on patient care and prospects for improved outcomes for patients.....

i) **Prevention and intervention in stroke.** Investigators: Majid, Venables, Harkness, Blank, Lindert, Redgrave.

j) **Risk assessment for patients with cerebral aneurysmal disease.** Investigators: Patel, Hose, Lawford, Frangi.

k) **Disease modifying therapy development for multiple sclerosis (MS).** Investigators: Sharrack, Price, Howell

l) **Aetiology of idiopathic intracranial hypertension (IIH).** Investigators: Sharrack, Price, Howell, Hickman

m) **Gluten-related neurological disease.** Investigators: Hadjivassiliou, Sanders, Aeschlimann, Grünewald, Woodroffe

n) **Immune mediated ataxias.** Investigators: Hadjivassiliou, Hoggard, Shanmugarajah, Grünewald

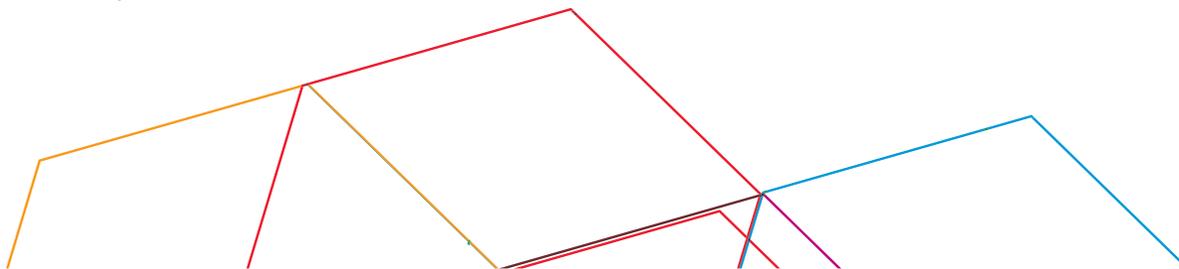
o) **Epilepsy, non-epileptic attack disorders and functional neurological syndromes. Use of Conversation Analysis as a diagnostic method.** Investigators: Reuber, Jenkins, Blackburn, Venneri, Harkness, Grunewald, Dickson, Howlett.

## 2. ACHIEVEMENTS SINCE THE CREATION OF THE ACADEMIC DIRECTORATE OF NEUROSCIENCE IN 2011....

### 2.8 Key awards and esteem indicators since 2011:

**Honorary Professorships** awarded to two of our Directorate consultants in 2012 (Sharrack and Hadjivassiliou). University promotions to **Chair** (Reuber in 2012; Bandmann in 2013) and to **Reader** (McDermott 2013).

- **BANDMANN:** Vice-chair Research Advisory Panel Parkinson's UK, Fellow of the American Academy of Neurology (FAAN), invited plenary lectures at annual meetings of German Genetic Society 2014, South Korean Movement Disorders Society 2014, Heart of Europe Zebrafish meeting 2014, Guest lecture at Pittsburgh Institute for Neurodegenerative Diseases (PIND) 2014.
- **HADJIVASSILIOU & SARRIGIANNIS:** Prize for best Consultant presentation at the North of England Neurological Association 2011.
- **HADJIVASSILIOU:** Member of the medical advisory boards of Ataxia UK, Coeliac UK and the Neuropathy Trust. Member of the International Friedreich's Ataxia Working Party. Founding member of the Sheffield Institute of Gluten Related Diseases (SIGRED). Director of the Sheffield Ataxia Centre (awarded Centre of Excellence status by Ataxia UK). Special Commendation Award by Coeliac UK for support and education of patients with neurological manifestations of gluten related diseases. Dawn Ind memorial chalice award (by the Neuropathy Trust) for services to patients with peripheral neuropathy.
- **MAJID:** Keynote speaker, Second International Meeting on Carnosine and Anserine, Tokyo Japan, July 2014. Chair, UK Stroke Forum Translation Stroke research Parallel session 2014.
- **REUBER:** Editor-in-Chief of Seizure – European Journal of Epilepsy (2010), Chair of the Psychogenic Nonepileptic Seizure (PNES) Special Interest Group of the American Epilepsy Society (2010), Chair of the PNES Task Force of the International League Against Epilepsy (ILAE, 2010), Member of the Neuropsychobiology Commission of the ILAE (2012), Co-Chair Psychobehavioural Treatment Task Force of the ILAE (2013), Chair of the Medical Advisory Board of Epilepsy Action (2010), Director of the British Neuropsychiatric Association (2010), Council Member of the ILAE UK-Chapter



## 2.8 Key awards and esteem indicators since 2011:

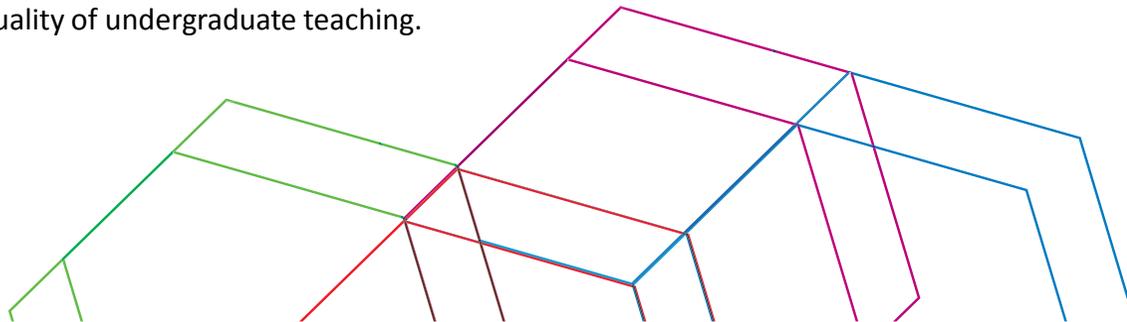
- **SHAW:** Elected President of the North of England Neurological Association 2012; Gary and Peggy Edwards Distinguished Visiting Professorship for ALS, Houston USA 2012; Visiting Professorship Association of Physicians (Kerala Chapter) India 2012; Elected to membership of the Medical Pilgrims 2012; Member MRC Neuroscience and Mental Health Board 2012-2016; Alfred Meyer's Memorial Award Lecture British Neuropathological Society 2013; NIHR Senior Investigator Award 2013; Dame Commander of the Order of the British Empire DBE for services to Neuroscience 2014; Jacobson Visiting Professorship, University of Newcastle upon Tyne 2014; Chair Progressive Supranuclear Palsy Research Advisory Panel 2013- 2017; Osler Lecture, Association of Physicians 2015.
- **VENNERI:** Appointed Scientific Director of the IRCCS San Camillo Foundation Hospital, Venice 2014; re-appointed to the Scientific Advisory Board of the Italian Society of Neurology-Dementia, 2014

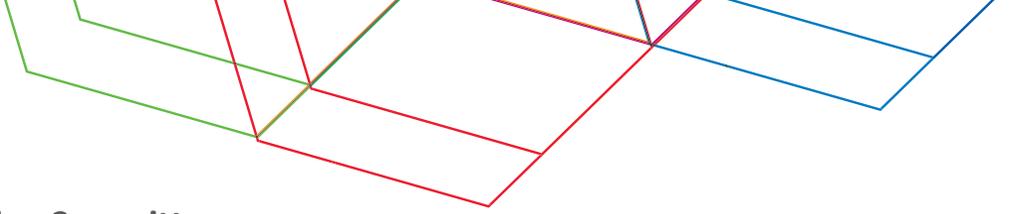
### AWARDS MADE TO JUNIOR NEUROSCIENCE RESEARCHERS:

- **Johnathan Cooper-Knock:** North of England Neurological Association research prize 2012 and European Consortium for the Cure of ALS (ENCALS) Young Investigator Presentation Prize 2012. MRC MNDA Lady Edith Wolfson Fellowship 2012.
- **Muhammad Rafiq:** North of England Neurological Association research prize 2013.
- **Laura Ferraiuolo:** EU Marie Curie Fellowship with outgoing component at Ohio State University, USA 2012
- **Heather Mortiboys:** Parkinson's UK Senior Fellowship awarded 2013.
- **Esther Hobson:** NIHR Fellowship awarded 2014.
- **Alisdair McNeill:** INSIGNEO Neuroscience Senior Fellowship 2014.

## 2.9 Other developments

We have appointed a Directorate Teaching Champion (currently **Dr Siva Nair**) to work alongside the University Teaching Lead with the aim of further developing the quality of undergraduate teaching.





## 3. Current Research Infrastructure

### 3.1 Academic Directorate of Neuroscience Research and Teaching Committee

At the inception of the Academic Directorate in 2011, the Research and Teaching Committee was formed to meet on a monthly basis to discuss and action upon pertinent issues within the Directorate relating to Research and Teaching. With representation from the Academic Director, the Research Theme Leads, Clinical Leads, Research Coordinator, Nurse Manager, Finance Manager and Operational Manager, the committee has been an effective arena in which to drive forward the research strategy of the Directorate. The committee have set up new processes to create transparent and accountable management of research such as a dedicated Research Finance account, a Research funding programme, a Research PA application & review process and a performance management process.

The committee review on a regular basis any studies which are struggling to recruit to time and on target (RTT) and suggestions are made to assist the researchers involved. The Research Coordinator works closely with the PIs and the portfolio team to ensure targets are realistic and are altered where necessary and that teams are ready to recruit their first patient soon after NHS permission is granted. We expect therefore to see progressive improvement in our RTT % figures and maintenance of the 70 day metric in future quarterly performance figures as we manage our research delivery performance more effectively.

### 3.2 Main research themes

Our current main research themes and research areas are highlighted in Table 1.

### 3.3 Number of research active staff

We currently have 136 research active staff within the Directorate and we are continuously making efforts to increase the numbers of staff actively engaged in clinical research studies. Key elements of capacity development since the creation of the Academic Directorate of Neuroscience in 2011 are highlighted in section 2.5. Currently we have generated funding to support 16 research PAs, supporting 17 research active consultants (with a range of 0.25 to 2PAs per individual).

## 3. CURRENT RESEARCH INFRASTRUCTURE....

### 3.4 Research support staff

We have appointed a research coordinator (Ms Jodie Keyworth) supported by 2 x part time administrative/secretarial staff.

### 3.5 Research nurses

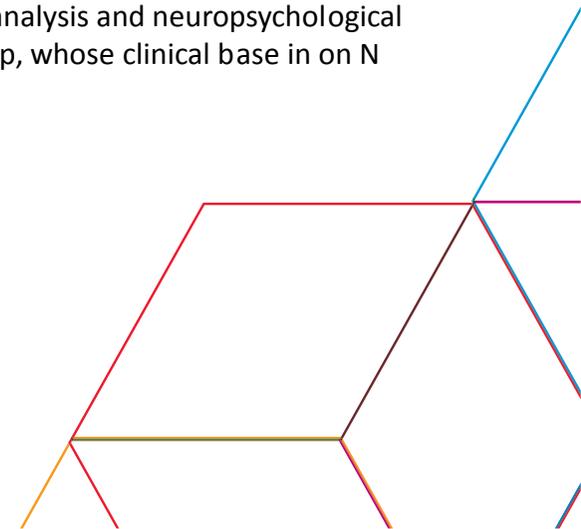
We currently have within the Directorate 24 GCP trained nurses. 17 nurses are currently engaged in research within the Directorate (7 on a full-time basis and 10 part time with research commitments ranging from 1 -15 hours per week). Funding for this research nurse support comes from various sources including grant and commercial trials income; Y & H CRN; and the Directorate research funds.

### 3.6 Clinical Research Facility (RHH site)

Much of our clinical research takes place in the CRF. Neuroscience was one of the 4 main themes resulting in the successful application and award of £3.1m to create an NIHR Experimental Medicine Centre for the STH CRF.

### 3.7 University research space on N floor RHH

This houses the Translational Neuropsychology group and includes office space and facilities for imaging analysis and neuropsychological testing. Space constraints are a major issue that needs addressing. In addition the Neurophysiology group, whose clinical base in on N floor, currently have no dedicated space and equipment for research.



## 3. CURRENT RESEARCH INFRASTRUCTURE....

### 3.8 Sheffield Institute for Translational Neuroscience (SITraN)

The Sheffield Institute for Translational Neuroscience, SITraN, is the first European Institute purpose-built and dedicated to basic and clinical research into motor neuron disease (MND) and related neurodegenerative disorders such as spinal muscular atrophy, Parkinson's and Alzheimer's disease. The Institute was created as the result of an unprecedented fundraising initiative set in motion by patients and public support, with support also from the University of Sheffield and the UK government.

SITraN was officially opened in 2010 by HM The Queen and HRH Prince Philip. The Institute provides a coordinated multidisciplinary approach to therapy development based on identifying causes and targets of proven pre-clinical effectiveness, bridging the gap from research discoveries in the laboratory to new therapies made available for patients in the clinic.

Since its opening, SITraN has grown immensely, now employing close to 200 staff and students, including 10 professors. The multidisciplinary team of scientists and clinicians combine all key research skills and expertise under one roof to accelerate the development of new treatments and make them available to patients as quickly as possible. The centre hosts ~ 90 postgraduate students offering highly specialised training for future clinicians and scientists to provide a long-term international focus for research excellence in neurodegeneration.

SITraN scientists have in the last 4 years produced over 300 original peer-reviewed research publications and attracted over £17 M in research funding for neurodegenerative diseases resulting in an impressive portfolio of original research, as well as a development pipeline of potential new therapies. Funds are invested in state-of-the-art facilities and the use of cutting edge scientific technologies in order to accelerate the pace of therapy development for the benefit of patients and families suffering from neurodegenerative disorders.

## 4. RESEARCH AIMS AND OBJECTIVES OVER THE NEXT 3 YEARS

1. Address current research skill gaps *e.g.* so that we have research strength from basic through to clinical research in several key strategic areas of research strength. Appointment of strategic new posts with high quality clinical researchers: dementia; epilepsy and Parkinson's disease/ Movement disorders; basic neuro-inflammation research to support existing clinical research, are important priority areas.
2. Intelligent research portfolio development in line with government and funding body strategies eg DoH Stroke and dementia strategies and European neuroscience initiatives.
3. Demonstrate continuing improvement in key research metrics as directed by NIHR and at least 10% improvement in research income.
4. Build our reputation as one of the best-regarded regional Clinical Neuroscience departments in the UK, with increased/more stable critical mass in priority areas.
5. Exploit and effectively translate research opportunities – to achieve improved outcomes for patients with neurological disorders. Be able to demonstrate the impact of our research effort.
6. Continue to support research-active consultants, including new appointments, with research PAs. Exploit the new Clinical Academy scheme with SchARR.
7. Develop further research nurse support by encouraging existing ward-based and specialist nurses to train in and develop an interest in research, secondments to the CRF, applications to the Y&H CRN etc.
8. Continue to nurture the development of our clinical and science based junior researchers eg by attracting NIHR clinical academic trainees and developing these individuals towards prestigious fellowship awards.

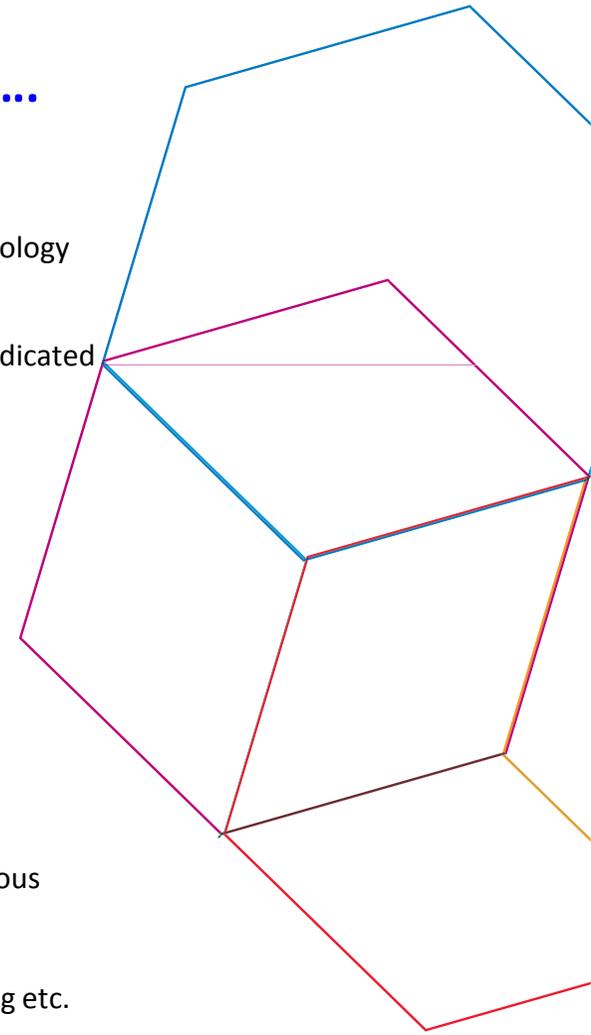
## ACADEMIC DIRECTORATE OF NEUROSCIENCE RESEARCH THEMES

|   | <i>Research Theme</i>                         | <i>Theme Lead</i>            | <i>Stage<br/>(Basic, Translational,<br/>Clinical, Health Services<br/>Research, Industry)</i> | <i>Key research areas</i>   |
|---|---|------------------------------|---|---|
| 1 | <b>EPILEPSY</b>                               | <b>Markus Reuber</b>         | Clinical  | <ul style="list-style-type: none"> <li>-Non-epileptic attack disorder</li> <li>-Conversation analysis</li> <li>-Epilepsy surgery</li> </ul>   |
| 2 | <b>NEUROINFLAMMATION</b>                      | <b>Marios Hadjivassiliou</b> | Clinical  | <ul style="list-style-type: none"> <li>-Neurological aspects of gluten sensitivity</li> <li>-Immune-mediated ataxias</li> <li>-Idiopathic intracranial hypertension</li> <li>- Clinical trials of disease modifying interventions in multiple sclerosis</li> </ul>  |
| 3 | <b>NEURODEGENERATION</b>                      | <b>Oliver Bandmann</b>       | Basic, translational, clinical, industry  | <ul style="list-style-type: none"> <li>-Molecular neuropathology</li> <li>-Understanding basic disease mechanisms using model systems and gene expression profiling</li> <li>-Neuroprotective therapy development –small molecule screening, gene therapy, nanotechnology</li> <li>-Biomarker development</li> <li>-Improvements in symptomatic management</li> </ul> |
| 4 | <b>NEUROSURGERY</b>                           | <b>John Yianni</b>           | Translational, clinical   | <ul style="list-style-type: none"> <li>- Epilepsy surgery</li> <li>- Neuro-oncology</li> <li>- Catheters for ventriculoperitoneal shunts</li> <li>- Craniectomy for evacuation of acute subdural haematoma</li> </ul>   |
| 5 | <b>NEUROVASCULAR</b>                          | <b>Arshad Majid</b>          | Clinical, industry  | <ul style="list-style-type: none"> <li>-Trials in acute stroke, prevention and rehabilitation</li> <li>-Unruptured aneurysms</li> <li>-Stereotactic radiosurgery for AVMs</li> <li>- Novel approaches for neuroprotection in cerebrovascular disease</li> </ul>   |
| 6 | <b>CLINICAL TRIALS -<br/>INDUSTRY LIAISON</b> | <b>Basil Sharrack</b>        | Clinical, industry  | <ul style="list-style-type: none"> <li>-Multiple sclerosis</li> <li>-Stroke</li> <li>-Motor neurone disease</li> <li>-New technologies e.g. diaphragm pacing, cough assist, telemedicine</li> </ul>   |
| 7 | <b>NEUROPHYSIOLOGY</b>                        | <b>Ptolemy Sarrigiannis</b>  | Clinical  | <ul style="list-style-type: none"> <li>- Motor system disorders including biomarker development.</li> <li>- Epilepsy and myoclonus</li> <li>- New methods for EEG and EMG analysis.</li> </ul>  |

**Table 1: Academic Directorate of Neuroscience: Main Research Themes**

## 4. RESEARCH AIMS AND OBJECTIVES OVER THE NEXT 3 YEARS....

9. Develop further our research infrastructure *e.g.* data-bases for several further disease areas, neurophysiology technician time for research.
10. Improve Research Finance support for the Neurosciences Directorate. Consider the appointment of a dedicated Finance Officer working with the existing finance team.
11. Development of neuroscience research areas:
  - Improved exploitation of rich areas which could form the basis of high quality clinical research *e.g.* young stroke cohort; post-stroke cognitive impairment; stereotactic radiosurgery.
  - Exploit inter – disciplinary areas *e.g.* first seizure and ischaemic stroke; vascular dementia; astrocytes in neurodegeneration; neurosurgery and medical physics.
  - Extract the research potential from areas of government priority for research *e.g.* stroke; dementia; translational neuroscience research/ experimental medicine.
  - Maximise the research potential of niche areas for Sheffield *e.g.* stereotactic radiosurgery; arteriovenous malformations; gluten sensitivity; non-epileptic attack disorder; motor neuron disease.  
Within the University - Health Services Research; Biomedical Science; Assistive Technology, Engineering etc.
  - Build our critical mass so that we have basic, translational and clinical research in specific disease areas *e.g.* more clinical research in Parkinson's disease and epilepsy, more basic research in MS.
12. Develop strategic partnerships with key pharmaceutical companies
13. Explore opportunities to introduce cutting edge neuroimaging equipment into Sheffield *e.g.* MRI PET scanner



## 5. COMMUNICATION AND PUBLICITY

We are in regular touch with the Trust Press Office and contribute to the regular research news bulletins in both the Trust and the University of Sheffield.

Recent publicity highlights:

- **UK study finds diaphragm pacing not beneficial to Motor Neuron Disease Patients**

<http://www.sheffield.ac.uk/news/nr/mnd-diaphragm-pacing-1.485527>

- **Two knights and a dame brave chilly waters for incurable illness**

<http://www.sth.nhs.uk/news/news?action=view&newsID=643>

- **Gene therapy boost for motor neurone disease**

<http://www.sth.nhs.uk/news/news?action=view&newsID=627>

- **Innovative technique prevents paralysis in mum-of-three**

<http://www.sth.nhs.uk/news/news?action=view&newsID=604>

- **Donation aids advancement in spinal surgery**

<http://www.sth.nhs.uk/news/news?action=view&newsID=636>

- **The app a day which could keep the doctor at bay for MND patients**

<http://www.sheffield.ac.uk/news/nr/app-for-mnd-patients-1.412723>

## 5. COMMUNICATION AND PUBLICITY.....

- **Channel 4 programme**

Professor Sanders to feature on 'Diet Special' episode of Food Unwrapped on Monday 5<sup>th</sup> January on Channel 4 at 8pm.

- **Scared out of your mind: Halloween, fear and the brain**

<http://www.sheffield.ac.uk/news/nr/halloween-fear-brain-mind-sheffield-university-1.416241>

- **New lead for potential Parkinson's treatment: Effects of high-risk Parkinson's mutation are reversible**

<http://www.sheffield.ac.uk/news/nr/high-risk-parkinsons-mutation-is-reversible-1.412092>

- **However unconvincing that scam seems to you, some brains trust more than others**

<http://www.sheffield.ac.uk/news/nr/brains-decide-trust-someone-comment-1.412262>

- **World's largest ever Parkinson's disease study**

<http://www.sheffield.ac.uk/news/nr/parkinsons-awareness-week-expert-comment-1.365202>

- **Article in the Telegraph on Conversational Analysis in the memory clinic study:**

<http://www.telegraph.co.uk/health/elderhealth/11319147/How-to-tell-if-memory-problems-are-really-a-sign-of-dementia.html>

## 8. PATIENT AND PUBLIC INVOLVEMENT

Neuroscience researchers in Sheffield benefit from opportunities to engage with patient groups and the public because of the vibrant PPI policies in the Academic Directorate within STH Trust and the University of Sheffield Department of Neuroscience. Neuroscience investigators are active in outreach to local, national and international meetings in collaboration with neurological disease charities.

The SITraN development required major public support and awareness to raise £18m through the Sheffield Institute Charitable Foundation, including high profile fund raising projects and regional and national media interest. Within SITraN, we have a regular Open Day to allow patients and family members to hear about our research programmes and to talk directly to the clinicians and scientists working within the Institute. The last Open Day on July 2014 attracted 150 members of the public. Members of SITraN also participate in the University of Sheffield outreach programme for local schools. We frequently host site visits from disease charities and patient self-help organisations such as Parkinson's UK, the Alzheimer Research UK network, the MND Association, the Multiple Sclerosis Society, Ataxia UK, Epilepsy Action and engage to speak at their local, regional and national meetings. As part of these networks we periodically organise scientific as well as public meetings to increase public awareness of neurological disorders and communicate advances in diagnosis and treatment and available care pathways.

An example of a local PPI development which has been applied to other neurological disease areas is the **Sheffield Motor Neurone Disorders Research Advisory Group (SMNDRAG)** which was established in 2009, guided by NIHR principles, with the following aims: 1. To include patient and carer perspectives in research strategy and priorities; 2. To assist with the success of ongoing research studies in terms of recruitment and provision of information helping to ensure that studies are delivered on time and to target; 3. To assist in the writing of lay summary documents; 4. To raise awareness and the profile of research in this disease area and build public confidence and trust; 5. To assist in the dissemination of research findings. Members of the SMND RAG have formed part of the application team for multiple recent funding applications. In addition, Sheffield neuroscience researchers have direct access to the DeNDRoN and Stroke Network Public and Patient Involvement group, linked to INVOLVE, to maximise opportunities to increase awareness, understand lay concerns, and manage public expectations. Similar research advisory groups have been established in the fields of **dementia, cerebrovascular disease and epilepsy.**



