Institution: UNIVERSITY OF OXFORD

Unit of Assessment: 4

a. Overview

The aim of Oxford psychology, psychiatry and neuroscience research is to generate world-leading advances in the understanding of mind, brain and behaviour, in health and disease, and to translate this into major benefits for health and society. Our existing strengths, especially in psychology (reflected in RAE 2008), have been broadened and enhanced by significant new initiatives and achievements in translational and clinical neuroscience, underpinned by a new research strategy, substantial investments, and improved organisational processes. Highlights during the REF period include:

- 12 externally-recruited Professorial-level appointments (*Brown, Clark, Duncan, Ehlers, Fox, Humphreys*, *Husain*, *Kennard*, *Newton*, *Riddoch*, *Sharpe*, *Snowling*), with *Lovestone* (KCL) arriving in February 2014.
- 6 Wellcome Trust Principal Research Fellows (*D Bishop*, *Ehlers*, *Fairburn*, *Flint*, *Husain*, *Williams*), 3 Wellcome Senior Investigators (*Fugger*, *Rothwell*, *Rushworth*), 4 Wellcome Senior Research Fellows (*Bannerman*, *Bennett*, *S Fazel*, *Newton*), 3 ERC Senior Investigators (*Dunbar*, *Fox*, *Humphreys*), and 1 MRC Senior Clinical Fellow (*Freeman*).
- 6 Wellcome strategic awards (*Duncan*, *Foster*, *Fairburn*, *Smith*, *Harrison*, *Tracey*).
- Grant income of £104M, with a 32% increase from 2008-9 to 2012-13.
- New facilities and infrastructure, including 7T MRI, non-human primate MRI, the Oxford Centre for Human Brain Activity, and the NIHR Oxford Cognitive Health Clinical Research Facility.
- A substantial body of research from our ~98 returned FTEs (107 people), including over 150 papers in *Science*, *Nature* journals, *Neuron*, *Journal of Neuroscience*, *PNAS*, *Psychological Science*, *Brain*, and *The Lancet*. Our graduate students have published 375 first-author papers, cited over 6,000 times.
- New graduate programmes, including a £6.2M Wellcome-funded scheme for clinicians dedicated to mental health, and an EU Marie Curie Initial Training Network (£1.5M to Oxford).
- Significant contributions to the discipline, with many leadership roles, and recognised by awards since 2008, including 1 CBE, 3 FRS, 5 FBA and 5 FMedSci (see section ***e4***).

Underpinning and facilitating these achievements, we have substantially revised our organisational processes, structure, and relationships:

- Creation of the *Nuffield Department of Clinical Neurosciences.*
- Formation of the Neurosciences Strategic Oversight Committee, and Impact Committee.
- New arrangements to integrate research across the three UoA4 departments (*Experimental Psychology, Clinical Neurosciences, Psychiatry*).
- 9 research groupings (Fig.1) and several research Centres.
- Significant improvements in how we mentor and develop students and staff.
- Major involvement in key externally-facing NIHR structures and activities.
- Substantially greater involvement with both local NHS Trusts.

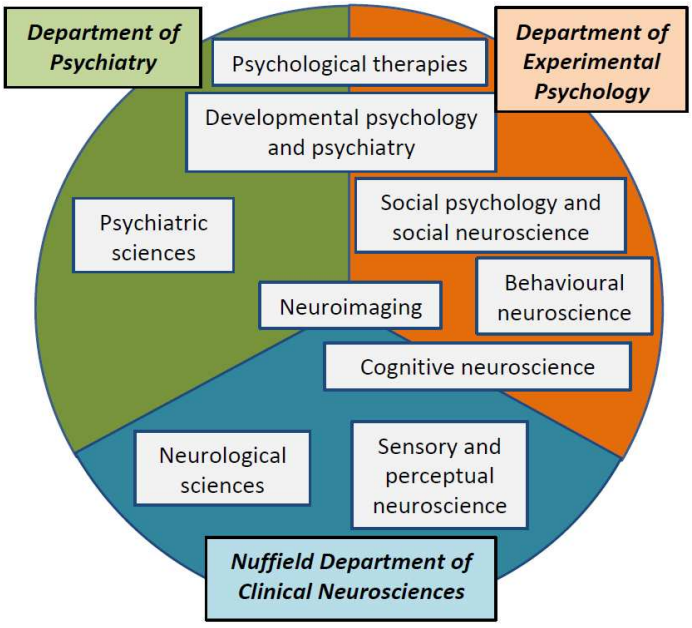

Fig. 1. UoA4 Departments and research groupings

b. Research strategy

Our strategy is to maximise the potential of our excellence in psychology, psychiatry and

neuroscience research, building on areas of strength and investing in new ones where opportunities exist. Our focus has been shaped critically by external priorities and drivers, such as the MRC Strategic Reviews of Neurodegeneration (2008) and Mental Health Research (2010), both chaired by *Kennard*; by the Government's 2011 *"No Health without Mental Health"* document, and by the Wellcome Strategic Plan (2010), to ensure that our research addresses the most timely and important issues. We have built on existing strengths, have enhanced integration across Departments, and have created new research synergies. These steps have required major changes in our internal organisation and external relationships since RAE 2008, especially to deliver a more translational agenda. Our research groupings, and our investments in recruitment and infrastructure are best understood in the context of these changes, which have already had tangible benefits, including major new ventures, new grants, outputs, and future opportunities.

b1. Structural re-organisations and investments: enhancing vitality and sustainability

Since 2008 there have been radical changes affecting this UoA to increase academic and administrative integration, and significant changes to the relations between University and NHS to foster translational and clinical research (Fig. 2).

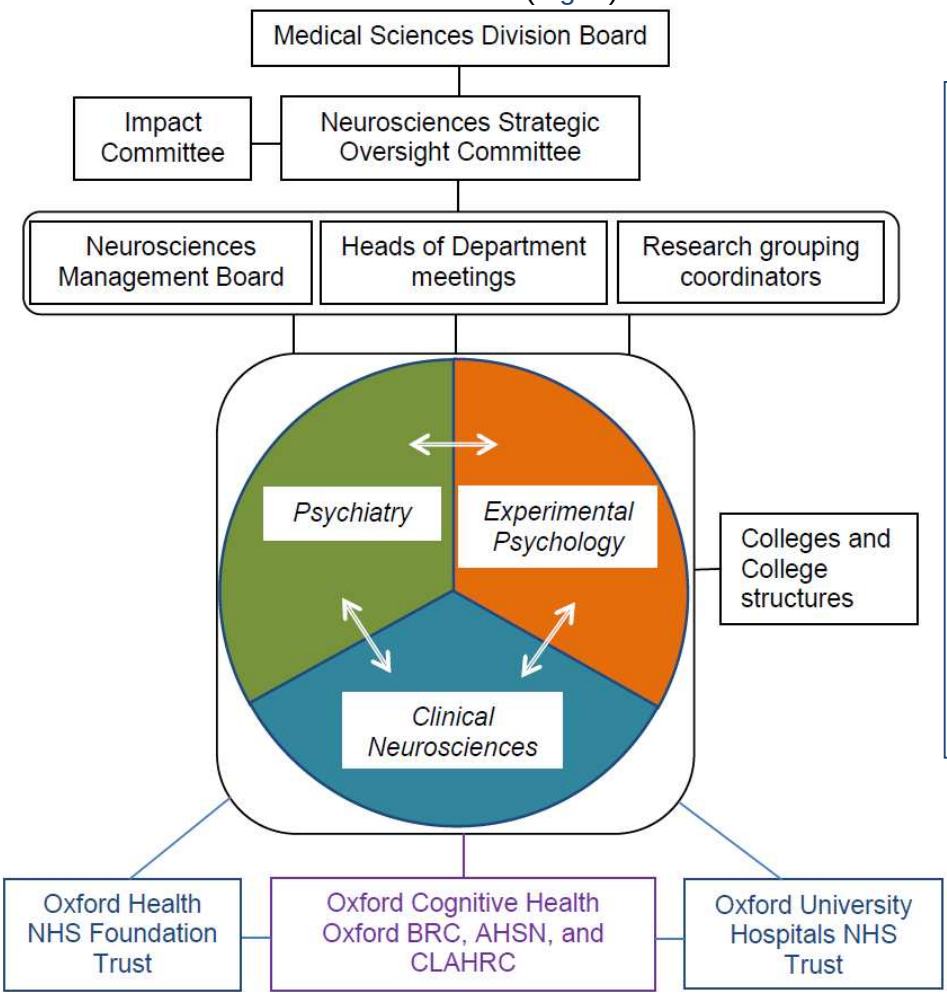

Fig. 2. Oxford UoA4, showing the three Departments and their major interfaces with University structures and processes (black), local NHS partners (blue), and NIHR initiatives (purple).

AHSN: Academic Health Science Network. BRC: Biomedical Research Centre. CLAHRC: Collaboration for Leadership in Applied Health Research and Care.

Neuroscience was designated a top priority in the 2009 five-year strategic plan for the Medical Sciences Division (head: *Buchan*). It outlined five main objectives: i) to develop integrated research themes, ii) grow the neuroscience community, iii) ensure appropriate infrastructure, iv) expand opportunities for clinical research and experimental medicine, and v) create an identity and vision for Oxford neuroscience. This prioritisation has fostered the many developments to be described.

As a key first step, in 2009 the Division established the Neurosciences Strategic Oversight Committee (chair, *Kennard*), to provide leadership, a vision, and to promote integration and innovation. A subsidiary Neurosciences Management Board includes wider faculty representation. The Committee oversaw the merging of 3 clinical departments (Neurology, Anaesthetics, and Ophthalmology) to create *Clinical Neurosciences* in 2010. This has had several benefits, notably promoting collaborations between scientists in the three former departments, and paving the way

for substantial new links with *Experimental Psychology* and *Psychiatry*, described below. To drive forward the work of the Oversight Committee, a post of Translational Neuroscience Research Portfolio Manager was created in 2011 (filled by a neuroscientist with an industrial background). The post, plus an assistant, is now funded by the three Departments, illustrating our commitment to the translational agenda. The Oversight Committee is complemented by monthly meetings of Heads of Departments, and by the Impact Committee (see REF3a), to ensure a vertically and horizontally integrated research strategy (Fig. 2). We have also made major improvements in how we disseminate information, e.g. via www.neuroscience.ox.ac.uk, which serves as a single portal (linked to other websites), and a fortnightly news email sent to all staff and students.

b2. Developments building on existing strengths

As well as the many new initiatives to be described below, we have built upon existing strengths where they are consistent with our overarching strategy. Highlights include:

- A new behavioural neuroscience unit for rodent models, with state-of-the-art measurement techniques (e.g. *in vivo* voltammetry; *Bannerman, Walton* and others).
- Expansion of MRI, with acquisition of 7T (*Tracey*), new imaging sequences, and multimodal analysis (Wellcome strategic award to *Smith*), and involvement in large-scale projects (see ***e2***).
- Creation of the Oxford Centre for Human Brain Activity (*Nobre*) including MEG, TMS, EEG and infra-red spectroscopy.
- Enhanced non-human primate research facilities, with 3T MRI, multi-electrode recording and optogenetics, creating a national centre of excellence (Wellcome strategic award to *Duncan*).
- Establishment of the Oxford Centre for Developmental Science in *Experimental Psychology* (*D Bishop, Cohen Kadosh, Mottonen, Nation, Plunkett, Scerif, Snowling, Watkins*).

b3. Strategy to promote and enhance translational and clinical research

Driven by our strategic prioritisation of translational science, and a shared vision to improve clinical research and patient outcomes, our relationships with the local NHS have been transformed.

- *Clinical Neurosciences* is housed in the John Radcliffe Hospital West Wing, which also contains the Oxford University Hospitals NHS Trust (**OUHT**) neurology and ophthalmology clinical facilities. This provides an ideal base for translational research with many patient groups.
- In 2010, OUHT formed a new clinical management structure, with *Kennard* becoming Director of Clinical Neurosciences (as well as Head of the University Department). This appointment illustrates the increased integration between University and NHS, and will facilitate translation and ensure rapid take-up of therapies arising from our research.
- There has been a comparable advance in links with our other main NHS partner, Oxford Health Foundation Trust (**OHFT**) which provides mental and community health services across Oxon and Bucks. Strategic planning at OHFT is now integrated with major research initiatives. *Geddes* is both Head of *Psychiatry,* and Director of Research and Development, and Associate Medical Director, for OHFT. The Chief Executive Officer and Medical Director of OHFT both have honorary University appointments.
- Several researchers recruited during the REF period (e.g. *Clark, Ehlers, Humphreys, Husain, Riddoch, Sharpe*) provide local clinical services (e.g. cognitive screening of all stroke patients; psychological therapies) to forge unusually strong University-NHS links of rapid, mutual benefit.

These organisational developments reflect, and are driving, substantial new academic/clinical links:

- In 2008 the Oxford NIHR Biomedical Research Centre was established (Director, *Buchan*) and included a 'Brain' theme funding several projects. In the second quinquennium (2012-17) the UoA4-directed component has almost doubled (from £900k to £1.7M/year), with themes on cerebrovascular disease (*Rothwell*), functional neuroscience (*Brown*), and cognitive health (*Nobre*), as well as the Acute Vascular Imaging Centre (*Buchan*).
- The NIHR Oxford Cognitive Health Clinical Research Facility is a striking example of a successful academic-clinical partnership. A joint venture between the three Departments and both NHS Trusts, largely funded by NIHR (£3.75M), it incorporates an 8-bed facility on the *Psychiatry* site (*Geddes*), the Charles Wolfson Clinical Research Facility at the John Radcliffe Hospital (*Brown*), the Cognitive Neuropsychology Centre (*Humphreys, Husain, Riddoch*) and the Centre for Anxiety Disorders and Trauma (*Clark, Ehlers*). The latter two Centres enable, for

the first time, large groups of patients to be tested and treated in *Experimental Psychology*.
- The Oxford Cognitive Health and Neurosciences Clinical Trials Unit supports randomised clinical trials, and new database structures for research into cognitive aging and stroke, creating common pools of participants and maximising efficient use of resources.
- We are part of two major new NIHR initiatives announced in 2013: the Oxford Academic Health Science Network, and Collaboration for Leadership in Applied Health Research and Care (CLAHRC). The CLAHRC (£9M) has a strong focus on mental health and dementia, and includes themes led by *Geddes* and *Sharpe*.
- The growth of our NHS-related research is shown by 4 new NIHR Senior Investigators since 2008 (*Clark, Geddes, Goodwin, Rothwell*) to add to those previously awarded.

b4. Future aims and how we plan to achieve them

Our overall aim continues to be to achieve and maintain world-class excellence in critical, cutting-edge neuroscience and psychology, emphasising translational and clinical domains. To achieve this, our strategy includes the plans already described, and others under active development:
- Oxford Dementia and Ageing Research (OxDARE) has been formed to co-ordinate Oxford's response to the Prime Minister's Challenge on Dementia. It is a consortium involving six Departments (including the three in this UoA) together with the two Oxford NHS Trusts, and the Thames Valley DENDRON network. The recruitment of *Lovestone* from KCL reflects our strategic commitment to this area, and will be followed by substantial further investments.
- A Centre for Neurorehabilitation, hosted by *Clinical Neurosciences* and *Experimental Psychology,* led by *Johansen-Berg*, also *Humphreys, Mackay*, based around enhancement of plasticity and learning via brain stimulation (Wellcome strategic award in progress).
- Formation of the MRC University Unit for Temporal Dynamics of the Brain (led by *Brown*), to replace the MRC Anatomical Neuropharmacology Unit in 2015.
- Establish a single-centre EU Marie Curie Initial Training Network (see section ***cii***).
- To expand neuroimaging capacity for *Psychiatry* (see section ***d4***).
- To develop our status as a global bipolar disorder research centre (section ***b5****, Grouping 8).*
- An interdisciplinary centre, bringing together researchers in psychology, linguistics, education and social policy, to develop and implement theoretically-motivated cognitive and psychosocial interventions stemming from basic psychological science, nationally and in the developing world (*D Bishop, Nation, Plunkett, Snowling*).
- To further expand our translational agenda via increased NIHR-related activities (section ***d4***).

b5. Research groupings

Our research groupings (Fig. 1) reflect the increasingly large-scale and inter-disciplinary nature of our work. They are fluid, evolving to optimise our ability to respond to and shape the global research agenda, and include methods-oriented work (contributing to research across many groupings), cross-disciplinary groups working on common themes, and groupings that respect long-term discipline boundaries. Each has a co-ordinator who reports to the relevant Departmental Committees and to NSOC (Fig. 2). His/her role is to overview the grouping's research and strategy, and promote an optimal research environment. This includes: (i) research-related training, (ii) being alert to new research and funding opportunities, (iii) organising seminar programmes, and (iv) ensuring mentoring schemes are in operation. As well as the groupings, several 'Centres', both virtual and actual, have been created since 2008 (in addition to those pre-existing). Centres give focus and coherence to major research programmes, improve infrastructure and foster growth. They are described in the grouping to which they are most closely allied.

NB: Many researchers belong to more than one grouping; their primary affiliation is shown in ***bold****. The grouping co-ordinator is underlined. *Denotes early career researcher (ECR).*

Grouping 1: Neuroimaging. ***Smith***, ***Behrens***, ***Blockley****, ***Douaud***, ***Jezzard***, *Johansen-Berg*, ***Koopmans****, *Mackay*, ***Mantini****, ***Miller***, *Nobre*, *Rushworth*, *Stokes*, *Tracey*, ***Woolrich***.

Neuroimaging is a central element of Oxford's neuroscience, a key part of our strategy, and is a component of all our research groupings. It is based in the Oxford Centre for Functional Magnetic Resonance Imaging of the Brain (**FMRIB**, director *Tracey*), and now also the Oxford Centre for Human Brain Activity (**OHBA**; established 2010; director *Nobre*) which houses MEG and EEG, as

well as the non-human primate MRI facility. Our extensive neuroimaging research programmes involve all three departments, and include world-leading strengths in image acquisition and analysis, and in applications to cognitive neuroscience, psychology, and brain disorders. Grant income to FMRIB since 2008 exceeds £32M. FMRIB has provided expertise in rolling out the expansion of imaging to MEG and non-human primate facilities, and *Jezzard* chairs the University Imaging Management Board to ensure all developments are integrated. The strategy of having a single (Siemens) platform across the campus facilitates integration and value for money. We continue to recruit the brightest rising stars (e.g. *Stokes*, *Mantini*, *Blockley*), and invest to remain at the cutting edge, including building alterations, scanner upgrades, and acquisition of 7T and non-human primate MRI. **Achievements in REF2014 period include** (in addition to the many imaging-related achievements of the groupings noted below): novel methods in neurovascular (*Jezzard*, *Miller*) and spinal cord (*Tracey*) imaging; optimisation of spatial extent and strength of signals (*Smith*); major developments in data analysis (*Woolrich*). **Future strategy**: (i) advance multimodal imaging, reflected in *Smith's* Wellcome strategic award; (ii) expand facilities, e.g. installation of MRI adjacent to MEG in *Psychiatry* to grow capacity; (iii) further develop animal imaging methods (see section ***b2***); (iv) grow expertise and critical mass in computational neuroscience; (v) expand our leading roles in large-scale projects (section ***e2***); and (vi) contribute further to national facilities and to enhancing NHS clinical neuroimaging capabilities.

Grouping 2: Cognitive Neuroscience. ***Nobre***, *Behrens*, ***S Bishop***, ***Boorman****, ***Chechlacz****, ***Cohen Kadosh****, ***Fleming****, *Fox*, ***Gillebert****, *Harmer*, ***Humphreys***, ***Husain***, *Mottonen*, ***O'Reilly****, ***Riddoch***, ***Smithson***, ***Spence***, ***Stokes***, ***Summerfield***, ***Symmonds****, ***Watkins***, ***Yeung***.
This grouping focuses on the cognitive and neural mechanisms determining human behaviour and their changes in behavioural and brain dysfunction. Group members utilise and integrate a wide range of approaches. Major funding includes ERC Senior and Starter Investigators, NIHR, Leverhulme, MRC and Wellcome programmes and Fellowships, and an EU Marie Curie Initial Training Network. The grouping contains the Oxford Cognitive Neuropsychology Centre (*Humphreys*, *Husain*, *Riddoch*). Opened in 2013 and part of the Oxford Cognitive Health NIHR Clinical Research Facility, it conducts basic and translational research on acquired neurological disorders, with assessment tools being implemented in local clinical practice. **Achievements include**: novel computational analyses of behavioural and brain-imaging data for attention and decision making (*Behrens*, *Fleming*, *Humphreys*, *Rushworth*, *Summerfield*, *Watkins*); parcellating parietal cortex to delineate attentional operations (*Chechlacz*, *Gillebert*); defining the precision of temporal attention, the neural coding of expectation, number representation and working memory (*Cohen Kadosh*, *Husain*, *Nobre*, *Stokes*); and detailing how sensory cues are combined in perceptual judgements (*Smithson*, *Spence*). **Future strategy** includes: (i) creating a multi-modal image analysis hub in *Experimental Psychology*; (ii) work with the *Neurological Sciences* grouping to develop a Centre for Neurorehabilitation (see section ***b4***); and (iii) link with the *Neuroimaging* grouping on computational neuroscience and model-based analyses.

Grouping 3: Developmental Psychology and Psychiatry. ***Nation***, ***Burnett-Heyes****, ***D Bishop***, *Cohen-Kadosh**, ***M Fazel***, ***Mottonen***, ***Newton***, *Park*, ***Plunkett***, ***Scerif***, ***Snowling***, ***Stein***, *Watkins*.
Research in this grouping covers two main areas. First, the cognitive and neural mechanisms underpinning speech, language, literacy, numeracy, attention, and executive function, and how these are affected in developmental disorders. Diverse approaches are used, including behavioural experiments, computational modelling, imaging, genetics, longitudinal studies, and interventions. The Oxford Centre for Developmental Science (section ***b2***) unites researchers in these domains, and provides key infrastructure, posts and facilities. The second area focuses on child psychiatry, investigating the interplay of risk and resilience factors alongside prevention and treatment of childhood disorders. **Achievements include:** identifying risk factors for, and the basis of, reading and language impairments (*D Bishop, Nation, Watkins*); successful classroom interventions for poor readers shown in large-scale trials (*Snowling*); demonstrating underlying similarities between dyslexia and autism (*D Bishop*); showing how maternal depression affects infant development (*Stein*). Funding includes Wellcome, ESRC, British Academy, McDonnell-Pew and Nuffield Foundations. **Future strategy** includes: (i) identifying the neural and cognitive factors that predict outcome of developmental disorders, via longitudinal studies and interventions; (ii) understanding learning and plasticity in relation to speech, language and numerical cognition; (iii) establishing

theoretical, methodological and clinical links with the *Cognitive Neuroscience* grouping; (iv) developing synergies between developmental psychology and child psychiatry to study links between cognition and mental health; (v) creating the new interdisciplinary centre mentioned in section ***b4***.

Grouping 4: Behavioural Neuroscience. ***Rushworth***, ***Bannerman***, ***Buckley***, ***Duncan***, ***Flint***, *Harrison*, *Mantini**, *Mars*, ***Mitchell***, ***Murphy***, *Peirson*, *Tunbridge**, ***Walton****.
The grouping uses rodents and non-human primates to investigate the basis of behaviour and its disorders. Based in *Experimental Psychology*, it uses state-of-the-art facilities in the adjacent Biomedical Sciences Building (2010). The grouping runs the new Jeffrey Gray Behavioural Neuroscience Unit (Director, *Bannerman*; Wellcome infrastructure award), the non-human primate facility, and the Integrated Neural Networks in the Primate Brain group (*Duncan*). **Achievements include**: delineating the role of frontal lobe structures in task control (*Buckley*, *Rushworth*); elucidating the nature of task representation in prefrontal cortex (*Duncan*); establishing *in vivo* voltammetry in mice (*Walton*); revealing cortical and sub-cortical contributions to memory (*Mitchell*); hippocampal NMDA receptor function in memory (*Bannerman*), and new methods in behavioural genetics (*Flint*). Major funding comes from Wellcome (awards and Fellowships) and MRC. **Future strategy** includes: (i) combining optogenetic manipulations with fMRI and electrophysiological techniques to manipulate and record from neural circuits during behaviour; (ii) multi-electrode recording across distributed circuits; (iii) combining computational with experimental approaches; (iv) creating a 'big data' centre of excellence for systems neuroscience.

Grouping 5: Social Psychology and Social Neuroscience. ***Hewstone***, *D Bishop*, *Burnett-Heyes*, ***Crockett****, ***Dunbar***, *Fleming**, ***Heyes***, *Humphreys*, ***Mars***, ***Przybylski****, ***Sui****.
This grouping brings together long-standing interests in intergroup relations with work in the establishment and maintenance of social networks, and the neural correlates of social networks, altruistic behaviour, and self-biases. It includes collaborations across UoAs (section ***e1***) and two Centres: the Institute for Cognitive and Evolutionary Anthropology (*Dunbar*) and the Oxford Centre for the Study of Intergroup Conflict (*Hewstone*). **Achievements include**: the first longitudinal research on mediators underlying effects of intergroup contact on prejudice reduction, and generalised effects on attitudes towards multiple outgroups (*Hewstone*); the first demonstrations of neural changes related to the size of social groups (*Dunbar, Mars*); functional and neural bases of imitation and joint action (*Heyes*); a new metric for trading payment against pain in economic decision making (*Crockett*); and new procedures to study self-bias (*Sui*). Work is supported by large-scale awards from ERC (2 Senior Investigators), Leverhulme Trust, MRC and Wellcome. **Future strategy** includes: (i) an integrated suite of social cognition and social neuroscience labs; (ii) developing a new social cognition screen for brain-lesioned patients; (iii) studying social cognition networks in non-human primates; iv) applications of self-biases in information processing into cognitive training tools; and (v) large-scale evaluation of interventions to reduce group conflict.

Grouping 6: Sensory and Circadian Neuroscience. ***Tracey***, ***Bennett***, *Bridge*, ***Eippert****, ***Espie***, ***Foster***, ***Hankins***, ***Loken****, ***Maclaren***, ***Makin****, ***Pattinson****, ***Peirson, Slater****.
This grouping includes major programmes on pain, vision, circadian biology, and dyspnoea. It has evolved since 2008 by targeted recruitment and major grant support from MRC, Wellcome and other sources. It includes the Wellcome strategic award on Sleep and Circadian Neuroscience (*Foster*). The pain and vision research programmes are both similarly broad, spanning from basic mechanisms to novel therapeutics. **Achievements include**: the first explanation for how expectation influences therapeutic effects of analgesia (*Tracey*); evidence that psychological factors could act at spinal levels to modulate pain (*Eippert*); identifying neuregulin-1 as a key molecule in nerve repair (*Bennett*); first-in-man interventional studies of electronic retinal implants and retinal gene therapy (*Maclaren*); and discovering a new drug target for jet lag (*Peirson*). **Future strategy**: To further develop the group's translational, multidisciplinary focus. Initiatives include: (i) *Tracey* and *Bennett* are co-applicants on a Wellcome strategic grant (awarded October 2013) on pain, and (ii) are involved (with *Maclaren*) in stem cell therapeutics via the EU StemBANCC program. (iii) Developing new targets for breathlessness (*Pattinson*). (iv) Expansion of the circadian research (£5M from Sir Jules Thorn Charitable Trust, awarded November 2013 to *Foster*), and a sleep education programme (*Espie*).

Grouping 7: Neurological Sciences. ***Kennard***, ***Bogacz***, ***Beeson***, ***Bridge***, ***Brown***, ***Buchan***, ***Cheeran****, ***Esiri***, ***Fugger***, ***Johansen-Berg***, ***Mehta***, ***O'Shea***, ***Pendlebury***, ***Rothwell***, ***Rounis****, ***Stagg****, ***Talbot***, ***Tofaris****, ***Vincent***, ***Voets****.
This grouping focuses on epidemiological, laboratory and clinical research in 4 major neurological disease areas: cerebrovascular disease, neurodegeneration, multiple sclerosis, and channelopathies. **Achievements include**: identifying a key neuroprotective protein *(Buchan*); demonstrating the role of blood pressure variability in the aetiology of stroke and vascular dementia *(Rothwell);* the first *in vivo* evidence of white matter structural plasticity (*Johansen-Berg*); showing that an ion channel is of pathogenic and therapeutic relevance in multiple sclerosis *(Fugger*); the first successful trial of brain computer interface-controlled deep brain stimulation for Parkinson's disease *(Brown*). Research has been facilitated by the new Charles Wolfson Neuroscience Clinical Research Facility, and major funding from MRC, Wellcome and others. The Stroke Prevention Unit (*Rothwell*) won a Queen's Anniversary Prize for Higher Education (2013). **Future strategy** is focused around the development of two new Centres: the Wolfson Centre for Prevention of Stroke and Dementia (Director: *Rothwell*; shortlisted for Wellcome strategic award); and the Oxford Centre for Neurorehabilitation (see *Cognitive Neuroscience* grouping). Our multiple sclerosis research will be significantly enhanced by a European consortium, to be led by *Fugger*.

Grouping 8: Psychiatric Sciences. ***Harrison***, *S Bishop*, ***Burns***, ***Cipriani***, ***Cowen***, ***Ebmeier***, ***S Fazel***, *Freeman*, ***Geddes***, ***Goodwin***, ***Harmer***, ***Hawton***, ***Kringelbach***, ***Lennox****, ***Mackay***, *Newton*, ***Park***, *Sharpe*, *Stein*, ***Tunbridge****.
Research in this grouping focuses on biological, epidemiological and social aspects of psychiatry. Work is funded by Wellcome, MRC, NIHR and other sources. **Achievements include**: *Burns* showing that Community Treatment Orders do not work; *Geddes* and *Goodwin* showing in a large RCT that lithium is more effective than valproate in bipolar disorder; *S Fazel* quantifying the risk of violence in schizophrenia; *Lennox* identifying that some cases of schizophrenia may be due to antibodies; and *Mackay* showing effects of ApoE genotype on brain structure and connectivity in young adults. The grouping includes the Oxford Cognitive Health clinical research facility and Neuroscience Clinical Trials Unit (section ***b3***), the Centre for Suicide Research (*Hawton*), and links with P1Vital (see ***e3***). **Future strategy** includes: (i) a strengthened translational focus on bipolar disorder, building on a new Wellcome strategic award to *Harrison* and *Geddes*; (ii) enhanced neuroimaging capacity, with psychiatry-dedicated 3T MRI being installed; and (iii) substantial growth of dementia research, to be led by Lovestone, newly recruited from KCL (section ***b4***).

Grouping 9: Psychological Therapies. ***Ehlers***, ***Clark***, ***Fairburn***, ***Fox***, ***Freeman***, ***Miklowitz***, ***Sharpe***, ***Williams***.
This grouping has a distinctive research strategy that combines phenomenological, experimental and clinical studies to identify and modify the key cognitive processes maintaining a target disorder. It developed when Oxford built upon its psychological therapy expertise by recruiting *Clark*, *Ehlers*, *Fox*, *Freeman* and *Sharpe*, and includes 3 Wellcome Principal Research Fellows, 1 ERC Senior Investigator and 1 MRC Senior Fellow. Three allied research centres have been created: the Oxford Centre for Anxiety Disorders and Trauma (*Clark*, *Ehlers*), the Centre for Research on Eating Disorders at Oxford (CREDO-1)/Centre for Research Dissemination at Oxford (CREDO-2), funded by a Wellcome strategic award (*Fairburn*), and the Oxford Mindfulness Centre (*Williams*). Other funding is from MRC, Wellcome, and NIHR. **Achievements include**: a trans-diagnostic therapy effective for all eating disorders (*Fairburn*); establishing that cognitive therapy is the most effective treatment for social anxiety disorder (*Clark*, *Ehlers*); showing that mindfulness-based therapy is effective in recurrent depression (*Williams*); identifying the first genetic factor that mediates effectiveness of psychological therapy (*Fox*). **Future strategy** includes: i) complementing our core approaches with imaging pre- and post-treatment; ii) mediation analyses and identification of moderators; iii) extending our research in global dissemination of therapy and therapist training.

c. People

The environment we provide for staff and students is critical to the success and sustainability of our research strategy, and it underpins our thriving academic culture. Many improvements have been made in this regard since 2008, and further developments are underway or planned.

i. Staffing strategy and staff development

Our staffing strategy focuses on recruiting and retaining the highest quality researchers, and we are committed to supporting them and developing their careers. As noted earlier, the strategic review in 2009 led us to prioritise translational neuroscience and inter-departmental integration, and this is reflected in our recruitments, noted above. The same flexible strategy will continue.

Equality and diversity

We aim to recruit excellent researchers from as diverse a pool as possible. We follow the University's 'Integrated Equality Policy' and 'Code of Practice on Recruitment and Selection'. A termly newsletter from the Equality and Diversity Unit is cascaded to our Departments. The Oxford Learning Institute run a 'Recruitment and Selection' course that includes an equality module, and is mandatory for those chairing selection panels. The latter always include women and men. A Vice-Chancellor's Diversity Fund (£1M) was announced in July 2013 and we will apply to it to support specific equality and diversity initiatives (e.g. academic support during maternity leave).

Athena SWAN. Each Department has an active self-assessment team to implement and monitor the impact of strategies to provide equal opportunities, with a focus on women's careers. *Experimental Psychology* received a Bronze award in 2012; *Clinical Neurosciences* and *Psychiatry* in 2013. These build on the University's Bronze award. Our Athena SWAN initiatives include:

- Networking events, where early career researchers (ECRs) meet and discuss their work informally, complemented by termly meetings between ECRs and Head of Department.
- One member of each departmental executive committee takes responsibility for equality and diversity issues, and with a standing Athena Swan item on the agenda.
- A fact sheet explaining parental rights and outlining University policies including: Case studies for parental leave and flexible working; how to plan for leave and return to work; whom to speak to and when; childcare options; keeping connected; and how to manage work if child is sick.
- A review meeting prior to a woman going on maternity leave, to plan cover and return to work.
- Improving the visibility of women by: considering the gender balance of presenters, committees, etc, and by a new international series of talks by eminent women (Anne Treisman lectures).
- Working with NHS colleagues to develop a career re-entry programme in which clinical academics can re-start their careers in a highly flexible manner – often a day a week.
- A work-life balance section of our websites, linked to resources for student parents.

Career development of researchers

All researchers have an induction provided through: their Department, the University's online induction, and the Welcome Event for Researchers. These events introduce staff to the wealth of support available. The University's work in mentoring, personal development review, and career development was acknowledged by the European Commission's HR Excellence in Research Award (2012). The award recognises the systems and practices in place to support researchers in line with the Concordat to Support the Career Development of Researchers. The Concordat is implemented via the University's *'Code of Practice for the Employment and Career Development of Research Staff*', with support from Oxford Learning Institute, Research Services, Equality and Diversity Unit, Careers Service, and the Division's Skills Training Programme. All Departments have a monthly mailing list with career development and training opportunities, highlighted on intranet sites, and a leaflet introducing the range of support available.

All staff have regular appraisals and career development discussions with their supervisor (for research assistants), or with the Head of Department (for ECRs and PIs). These cover teaching, research, impact, administration, pastoral and outreach work, and identify needs and goals. Junior researchers are further supported by regular meetings where individuals present (and get feedback on) research ideas in a supportive setting, and where they can discuss funding and publication issues with senior academics. Junior researchers also benefit from practice interviews for Fellowships, and from critical but supportive internal peer review of grant proposals.

At the top of the career ladder, senior academics (4 to date) are supported to attend Leadership courses at Ashridge Business School.

Support for staff in post

Members of staff are entitled to a range of benefits to enhance their research careers, including:

- Generous parental and adoption leave. Maternity and adoption leave is 26 weeks' full pay, compared to 18 weeks' in many other HEIs [e.g. UCL, Cambridge]. Care is taken to cover teaching loads and ensure a smooth transition back to work.
- Comprehensive range of childcare services. Honorary clinical staff can apply for a place in NHS nurseries. *Experimental Psychology* has purchased two priority places in a University nursery.
- Academic staff (lecturer and above) have a default of being granted sabbatical leave from teaching duties, based on qualifying service, to focus on research.
- Applications for paid and unpaid leave are considered on a case by case basis and are granted, for example, to support researchers to receive specialised training overseas.
- Career planning for all newly appointed lecturers, with a reduced initial teaching and administrative load, regular mentorship meetings, and annual reviews with Head of Department. Newly appointed lecturers are prioritised for the allocation of graduate students.

Sustainability of staff structure

Sustainability of staff structure is addressed at multiple levels (e.g. departmental meetings, 'away days', meetings between Heads of Department and research grouping co-ordinators), and feeds into, and is influenced by, decisions of the Oversight Committee and Divisional Board (Fig. 2).

Underpinning our strategy in this regard, we place great value on recruiting and developing ECRs. This is illustrated by the fact we return 27 ECRs (14 are female), and 5 of whom did their doctorate in Oxford. Many ECRs hold prestigious Fellowships: Wellcome Career Development Fellowship (*Miller*, *Cohen Kadosh*); Royal Society University Fellowship (*Tunbridge*); MRC Informatics Fellowship (*O'Reilly*); HEFCE new blood senior lecturer (*Lennox*); Wellcome Intermediate Clinical Fellowship (*Tofaris*); MRC Centenary Award (*O'Reilly*); 2 British Academy Fellowships (*Burnett-Heyes*, *Chechlacz*); EPSRC Career Acceleration Fellowship (*Blockley)*; and 6 Sir Henry Wellcome/Henry Dale Awards (*Boorman*, *Crockett*, *Fleming*, *Gillebert*, *Loken*, *Mantini*).

Supporting and integrating clinical academics

We recognise that clinical academics have particular needs, and have dedicated ways to support and integrate them. A Clinical Academic Graduate School was set up in 2011 to oversee their training. It provides seminars, an accredited programme of research training, offers overseas academic and clinical placements, and assists in identifying funding opportunities. There is close liaison with clinical supervisors. Additional supports and processes operate within departments:

- *Psychiatry* has close working arrangements with the local NHS; the departmental head (*Geddes*) is Associate Medical Director of OHFT, facilitating co-ordination between, and optimisation of, the academic and clinical needs of mental health professionals in training.
- In *Experimental Psychology*, the Cognitive Neuropsychology Centre and the Centre for Anxiety Disorders and Trauma provide new hands-on training for clinicians in diagnosis and rehabilitation of neuropsychological conditions and in the assessment and treatment of anxiety disorders. Multiple courses have already been run since the Centres were formed in 2012.
- *Clinical Neurosciences* and *Psychiatry* take responsibility for academic and research elements of the NIHR Academic Clinical Fellow (ACF) scheme, and have an integral role in the selection process. Since 2008, we have had 15 ACFs and 9 Academic Clinical Lecturers (ACL). All ACLs completing training have been awarded a clinician scientist fellowships or lectureship.
- A new Wellcome-funded clinical academic doctoral scheme in mental health (see below).

ii. Research students

183 students completed a DPhil (=PhD) between 2008 and June 2013. 85% were submitted within 48 months, with a median of 42 months. 5 students (<3%) withdrew. 194 DPhils are underway.

Our students have high levels of achievement and satisfaction:

- Since 2008, our graduate students have published over 375 first-author papers. Almost 60% have one such paper, 22% have three or more. Nine of the papers already have >100 citations.

- Student prizes awarded include: 2009 British Psychological Society award for an Outstanding Doctoral Research Contribution; 2012 Italian Psychology Association best thesis award; 2013 'Rare Rising Stars: Black Student of the Year' award, presented at the House of Commons.
- In a 2013 confidential survey, our current graduate students were 'satisfied' or 'very satisfied' with their supervisors (92%), with Departmental support (87%), and with their overall experience (94%). 89% would recommend Oxford to others.

Our objective is to recruit the brightest students and provide a supportive environment allowing them to maximise their academic potential, to ensure their rounded personal development and the acquisition of generic and transferable skills. To help achieve this objective, since 2008 we have made major changes to our systems and processes.

- Complementing the Departmental systems and processes described below, all students are affiliated to a College. Colleges provide a broad intellectual environment as well as pastoral care and educational support (via College tutors), library facilities, financial support (e.g. to attend conferences) and accommodation (if desired), as well as many leisure and sporting opportunities to enrich the student experience.

Structures and processes to support and develop students

In 2012, the Medical Sciences Division Graduate School was launched, with overall responsibility for strategy and supervision of doctoral training. (Arrangements for clinical academics were described above). Within the Graduate School, the Doctoral Training Centre provides dedicated oversight and administrative support for 4-year courses (e.g. the Wellcome Neuroscience programme mentioned below, and the ESCR-funded programme in *Experimental Psychology*). The Divisional Director of Graduate Studies (DGS) is assisted by a DGS in each department. Key processes and structures include:

- An on-line system of termly reports, introduced in 2010. Student and supervisors each complete a report, highlighting progress, training received and required, and any problems or needs identified. Reports are reviewed by the DGS and any necessary actions taken.
- A Divisional Skills Centre, open to all graduate students, which organises courses and training such as data presentation and analysis, research techniques, teaching and writing skills.
- A wide range of courses, from statistics, bioinformatics, and Good Laboratory Practice, to plagiarism, personal effectiveness, and teaching. A review of courses needed and attended forms part of all students' termly progress review meetings with their supervisor(s).
- Dissemination of information to students (via websites and email) on events and activities across the Division and wider University.
- A student representative sits on departmental Athena Swan and research committees.
- The Oxford Newcomers Club and Graduate Students' Club are advertised to all students. The Cortex Club is a regular student-run forum for networking and meeting senior neuroscientists.

In addition, specialised courses are hosted to support development of specific skills, including:

- The FMRIB graduate programme provides training in physics, study design and analysis. The course was rated 'excellent' in a 2011 Wellcome review, and has received two Divisional teaching excellence awards since 2008. The numbers attending increase yearly, from 37 in 2009-10, to 65 in 2011-12. An equivalent MEG programme has been set up, and tailored department-specific courses translate imaging knowledge into hands-on skills.
- Specialist courses for computational cognitive and neural modelling, supported by our Marie Curie Initial Training Network in Individualised Diagnosis and Rehabilitation of Attention.

Mentorship of students

To ensure that graduate students' needs for training, supervision, career and personal development are realised, several policies are in place across UoA4.

- Every supervisor agrees to adhere to a code of practice developed by the Graduate Studies Committee and approved by the Divisional Board. It details requirements for preparation and induction, monitoring performance and progress, and supporting career development.
- All students have two independent advisors/mentors (one Departmental, one from their College), who provide support and advice, and who receive copies of the termly reports.

- After 4 terms, each student writes a report of their progress and plans, and has a viva with two independent assessors, before full DPhil status is confirmed. The process provides training in writing and viva experience, and allows any problems to be highlighted and resolved.

Major student training programmes in this UoA

- The Wellcome 4-year Neuroscience MSc/DPhil programme is internationally renowned. Hosted by *Experimental Psychology*, it funds 5 students/year. In 2008, there were 102 applicants from 42 nationalities and 63% had First class degrees; in 2013 the corresponding numbers were 214 (i.e. >40/place), 48, and 67%. Year 1 is a taught MSc providing a broad, cutting-edge neuroscience education, and two research placements. The 3-year doctoral work can be carried out in any relevant departments, with accredited supervisors. Since 2008, students on the programme have published 128 data papers, including 13 first-author papers in *Science, Neuron, Nature Neuroscience* and *Journal of Neuroscience*. 82% of students continued in science (including *Boorman*, *Johansen-Berg*, *O'Reilly*, *Tunbridge*, *Walton*), 20% have tenured academic posts; 9% entered medicine. The scheme was renewed in 2013 for a further 5 years.
- Our new Marie Curie Initial Training Network (£1.5M to Oxford) supports 14 studentships linked to internationally leading groups in attention and neurorehabilitation (4 local to Oxford). Students have secondments to the other groups to broaden experience and skills.
- National Institute of Health/Wellcome scheme (across Medicine): 3 UoA4 students since 2008.
- Continuation of our ESRC-funded doctoral training programme (2 places per year), and funding from MRC, BBSRC and EPSRC for graduate student training.

Future strategic developments in research student training

We continue to prioritise ways to improve the experience and outcomes of our students, and to increase the number of high quality training opportunities:

- In a major new initiative, Wellcome are funding a translational mental health-focused doctoral training scheme (headed by *Clark*, with *Ehlers*, *Harrison*, *Husain*) for psychiatrists, clinical psychologists, and neurologists. The Medical Sciences Division is providing a 40% contribution. Worth ~£6.2M, it will fund 3-4 students per year for five years, including all experimental costs.
- The Ministry of Defence are funding 2 *Experimental Psychology* studentships, starting in 2014.
- A single centre, EU Initial Training Network (ITN) is being applied for, to complement our hosting of the international ITN in translational neuroscience mentioned above.

d. Income, infrastructure and facilities

As earlier sections describe (see ***b2***-***b5***), substantial investments have been made since 2008 in infrastructure, facilities and recruitment, funded by success generating grant income, supplemented by institutional support. Ongoing developments ensure this trajectory will continue.

d1. Summary of income during REF2014 period

UoA4 grant income exceeded £104M, including £36M from Research Councils and £36M from Wellcome/other UK charities. Income grew by 32% between 2008-9 and 2012-13 (from £19M to £25.2M per annum) with a doubling of Wellcome income, and a 3-fold increase in EU funding.

d2. Summary of major investments in facilities and infrastructure

- Enhancement of FMRIB infrastructure, with £8.4M investment (MRC, Wellcome, EPSRC, and University) for new 7T and 3T scanners, plus £0.5M for an extra floor to house new staff.
- New non-human primate facilities from MRC and Wellcome strategic award (>£6M overall).
- New Biomedical Sciences Building for animal research, including UoA4-related work (£30M).
- Oxford Cognitive Health Clinical Research Facility (NIHR £3.75M; £600K University).
- The opening of *Clinical Neurosciences* in 2010, with refurbishment in 2012 for Neuromotor Research (£1.1M, from Charles Wolfson Trust, Biomedical Research Centre, and University).
- Centre for Prevention of Stroke and Dementia, funded by the Wolfson Foundation, 2012 (£4M). OUHT and the University have subsequently allocated a further £1.5M.
- Refurbishment of space in *Experimental Psychology* to establish the Oxford Centre for Developmental Science, the Oxford Centre for Anxiety Disorders and Trauma, and the Oxford Cognitive Neuropsychology Centre (£2.5M from University).

- Establishment of the Oxford Centre for Human Brain Activity in 2010, via a Wellcome infrastructure award (£700k) and Departmental funding (~£2 million).
- University investment in new databases to support large-scale population-based studies in ageing, Parkinson's disease and stroke (£500k).

d3. Other aspects of infrastructure and facilities

College contributions

Most academic staff have a College appointment in addition to their University one. Beyond their broader roles (e.g. space for graduate teaching, library, travel funds), Colleges provide an intellectual atmosphere and support to facilitate cross-disciplinary research. Magdalen College's Calleva Centre funds three-year projects into human behaviour; St Johns College's Research Centre funds inter-disciplinary projects (e.g. on eye movements and reading) and visiting scholarships and, through a benefaction, a Chair in *Psychiatry*; Wolfson College has a Mind-Brain-Behaviour cluster as a focus for research meetings and seminars.

Computing and IT

IT support is provided under a standard service specification, delivered to UoA4 by ~5 FTEs, enhanced by Departmental resources (e.g. for teaching, filming). Since 2008, clinical research has been facilitated by direct access to NHS systems from University-networked computers, and our population-based databases noted above. Our major research facilities (e.g. FMRIB) utilise separate, dedicated, computing networks (e.g. FSL MRI analysis environment; section ***e2***), supported by various sources (e.g. Wellcome strategic award to *Smith*, and Fellowships [*Mantini*]).

Libraries

Services are provided by the Bodleian Libraries, including the Radcliffe Science Library, and libraries on the hospital sites. The libraries support our research strategy in several ways:

- Research support, e.g. for systematic reviews, bibliometrics, and reference management.
- Providing training, via courses, e.g. Research Skills Toolkit, and 1-to-1 training opportunities.
- The Oxford Research Archive - an open access repository for papers and theses.
- Individual librarians are linked to each Department to offer specialised support.
- Membership is available to all NHS staff to facilitate clinical-academic interactions.

Technology transfer

Extensive support is available for tech transfer (via *Isis Innovation)* and to promote research impacts, including a specific role of the Research Portfolio Manager. Further details in REF3a.

Resource sharing

In 2012 the University launched an EPSRC-funded online database of facilities and equipment, fostering collaborations and savings. Several facilities are available to other HEIs, including 25% of time on the 7T MRI, a designated national resource. Our non-human primate facilities are used by others; e.g. the MRC Cognitive Brain Sciences Unit employs 4 post-docs in our facility.

d4. Pending and planned investments to underpin and advance our research strategy

A range of further planned investments reflect our on-going strategic developments. Many have already been mentioned (e.g. in sections ***b2-b5***), and include:

- We intend for Oxford to become a leading international centre for dementia. In addition to the investments to date, further plans include the current application to Wellcome and British Heart Foundation for £4.5M to complete the Centre for Prevention of Stroke and Dementia (*Rothwell;* section ***d2***), and by the recruitment of Lovestone (section ***b4***), whose appointment will be followed by major investments and grant applications.
- Application for the Oxford Academic Health Sciences Centre (decision imminent). The application highlights our expertise in translational neuroscience and psychological therapies.
- Refurbishment of facilities for the Sleep and Circadian Neuroscience Institute – funded by a Sir Jules Thorn Award (£5M) announced in November 2013.
- Refurbishment of space in *Experimental Psychology* to create an integrated centre for human cognitive neuroscience, and for social psychology and social neuroscience (£15M bid).

- Dedicated 3T MRI for *Psychiatry*. The Department and OHFT have each committed over £1M.
- Decisions awaited on three Wellcome strategic awards (*Johansen-Berg*, *Rothwell*, *Williams*).

e. Collaboration or contribution to the discipline or research base

Our researchers make substantial and multifaceted contributions to the discipline. One significant facet of external collaboration – with the NHS – has been described earlier; here we focus on other indicators of our wider contributions and influence, complementing the impacts detailed in REF3a and REF3b.

e1. Collaborations with research in other UoAs

UoA5: Molecular and genetic neuroscience is returned in **UoA5**, with which Uo4 has substantial links, and *all* Oxford neuroscience is coordinated by the Oversight Committee and structures in Fig. 1. Major UoA4-UoA5 collaborations include: (i) Oxford Parkinson's Disease Centre - basic science in **UoA5**, clinical work in *Clinical Neurosciences* (*Talbot*). (ii) The IMI StemBANCC consortium (€8M to Oxford) is led from *Clinical Neurosciences* but has work packages in **UoA5** (and elsewhere). (iii) *Foster's* Wellcome strategic award has a **UoA5** component and a bioengineer (**UoA15**). (iv) The *Behavioural Neuroscience* grouping provides facilities and supervision for **UoA5** researchers using mouse models, and for non-human primates.

Other UoAs: (i) The CLAHRC is led by the Department of Primary Care (**UoA2**). (ii) Researchers work with mathematicians (**UoA10**) to model bipolar disorder (*Geddes*) and cognitive disorders after stroke (*Humphreys*). (iii) The *Social Psychology and Social Neuroscience* group collaborates with sociology (**UoA23**), geography (**UoA17**), philosophy (**UoA32**), and education (**UoA25**). (iv) The *Developmental Psychology and Psychiatry* grouping work with linguistics (**UoA28**), computer scientists (**UoA11**) and education (**UoA25**). (v) *Smithson* collaborates with engineering (**UoA13**).

e2. External collaborations: increasing the global reach of research and training

We have developed several inter-institutional collaborations since 2008.

- McGill University, Canada, since 2009. 24 projects funded, worth £210K. The scheme received the 2012 McCarthy Tétrault Award of Excellence for Partnership, by the Quebec Government Office. From 2014, the collaboration becomes tripartite, involving Zurich University/Swiss Federal Institute of Technology, and supporting more advanced collaborations
- London School of Economics (Lord Layard & *Clark*), since 2011, to develop the economic case for psychological therapies in the NHS and to evaluate their effects with national databases.
- Lieber Institute for Brain Development, Baltimore, since 2012. *Harrison* and *Tunbridge* are adjunct faculty; the Institute's Director is co-applicant on *Harrison's* Wellcome strategic award.
- Hotchkiss Brain Institute, Calgary (2012). Includes staff and student exchanges and annual symposia, funded by a Hotchkiss charitable fund.

The global nature of our research is also indicated by:

- Major international projects: e.g. *Newton* runs programs in Kenya and Tanzania; *Flint* heads a genomic study of depression in China; *Humphreys* leads stroke screening programs in South Korea, Hong Kong and China; FMRIB is integral to the NIH Human Brain Connectome (*Behrens* leads the anatomical connectivity section), and the EU 'Developing Human Connectome'.
- Research products: e.g. FSL (FMRIB Software Library) is the most widely used software package in the world that covers all 3 MRI modalities, and freely available via the web. Other products are also being developed for remote access (e.g. the True Colours mood monitoring program via the web, and the Oxford Cognitive Screen on tablet; see REF3a).
- National and international publications: many outputs include co-authors outside Oxford. For example, 36% of the 128 papers published since 2008 by students on the Wellcome Neuroscience programme (see ***cii***) have a co-author from another institution in UK or abroad.

e3. Industrial collaborations to enhance research

- P1Vital Ltd is a Clinical Research Organisation, set up in *Psychiatry*, in part to commercialise *Harmer* and *Goodwin's* research (see REF3a). P1Vital continue to work with the *Psychiatric Sciences* grouping, funding research in Oxford worth over £1.6M since 2008.

- A strategic alliance, signed in 2012 with UCB (£3.2M) on projects related to neuroinflammation.
- Several researchers have joint publications since 2008 with industry, including GSK, Eli Lilly, Takeda, and Roche, arising from academic, non-restricted agreements.
- *Spence* works with several companies (including Toyota, Unilever, Kraft, Nestlé) to exploit multi-sensory perceptual capabilities to enhance product design, with grants worth >£1M since 2008.
- *Bannerman* is supported in part by the Eli Lilly-funded Centre for Cognitive Neuroscience.
- Phillips are providing state-of-the-art lighting systems to *Foster* to study circadian rhythms.

e4. Contributions to wider discipline since 2008

Leadership contributions: Funding panels, national bodies, learned societies, editorships

- *Kennard* chaired the MRC Neurosciences and Mental Health Board (2006-12); *Tracey* is Deputy Chair (2012-14). *Foster* sits on BBSRC Council. *Fairburn* was a Wellcome governor (2007-12). *Fugger* chaired the Danish MRC (2008-10). *Humphreys* chairs the Finnish Neuroscience council (2013) and Max Planck Institute psychology panel (2013-4). *Williams* chairs the British Academy Psychology section (2013-4). Returnees have held 27 other posts on major funding committees (e.g. MRC, Wellcome, and 5 abroad). Other contributions include: Royal College of Psychiatrists' Council (*Geddes*); Parliamentary groups (*Hawton*); NICE guideline groups (*Clark* [chair], *Ehlers*, *Fairburn*, *Geddes*); Department of Health working groups (*Rothwell*, *Clark*); British Academy Management (*Hewstone*) and Education (*Snowling*) groups.
- 10 Presidencies of learned societies, including: British Neuroscience Association (*Foster*), European College of Neuropsychopharmacology (*Goodwin*), British Neuropsychology Association (*Humphreys, Riddoch*), British Association for Psychopharmacology (*Harrison*), International Society for Magnetic Resonance in Medicine (*Jezzard*), Organisation for Brain Mapping (*Johansen-Berg*, *Smith*), plus many officer positions.
- 34 Editors and Associate or Deputy Editors of peer-reviewed journals, including *Rushworth* (senior editor, *J Neurosci*), *Humphreys* (editor, *J Exp Psychol Hum Percept Perform*), and *Snowling* (joint editor, *J Child Psychol Psychiat*).

Selected markers of esteem (since 2008)

- CBE to *Clark* for 'services to mental health', 2013.
- FRS: *Foster*, 2008; *Duncan*, 2008; *Vincent*, 2011.
- FBA: *Williams*, 2008; *Duncan*, 2009; *Humphreys*, 2009; *Snowling*, 2009; *Ehlers*, 2010.
- FMedSci: *Husain*, 2008; *Rothwell*, 2008; *Snowling*, 2008; *Fugger*, 2012; *Foster*, 2013.
- HonFRCP: *Vincent*, 2008. HonFRCPCH: *D Bishop*, 2008. HonFRCA: Tracey, 2009. HonFBPsyS: *Clark*, 2009; *Humphreys*, 2011. Hon ANA: *Vincent*, 2011; *Buchan*, 2013. German Academy of Sciences: *Ehlers*, 2010.
- Queen's Anniversary Prize for Higher Education (2013) to *Rothwell's* Stroke Prevention Unit.
- 4 ISI Highly Cited Researchers (2008 list) and 7 more in the provisional 2012 list. 12 F1000 Faculty members.
- Lifetime awards: *Snowling* (Society for the Scientific Study of Reading 2008; British Dyslexia Association 2012); *Clark* (American Psychological Association Distinguished Scientist Award 2011). *Duncan* (Heineken Prize for Cognitive Science 2012); *Hawton* (Morselli Medal 2012; Beck Prize 2013).
- Other prizes include: **2008**: NHS Health and Social Care Award (*Geddes*); Society for Personality and Social Psychology Cialdini Award (*Hewstone*). **2009**: BMJ award for Clinical Research (*Rothwell*); Sobek Prize for Multiple Sclerosis (*Fugger*); Patrick Wall Award, Royal College of Anaesthetists (*Tracey*); Academic Psychiatrist of the Year (*Sharpe*). **2010**: Beck Cognitive Therapy Prize (*Fairburn*); CINP Neuropsychopharmacology Award (*Harrison*). **2011**: World Stroke Association biennial award (*Rothwell*). **2012**: BBSRC Social Innovator of the Year (*Foster*); ECNP Clinical Neuropsychopharmacology Prize (*Harrison*); British Psychological Society Donaldson Prize (*Scerif*); Kurt Lewin prize (*Hewstone*); European Society for Cognitive Psychology Broadbent prize (*Humphreys*). **2013**: Bertelson prize (*Cohen-Kadosh*); ARVO Camras Award (*MacLaren*); International Reading Association Hall of Fame (*Snowling*); AE Bennett Award, Society for Biological Psychiatry (*Harmer*); German Psychology Prize (*Ehlers*); John Dystel Prize for Multiple Sclerosis Research (*Fugger*).