



**Norwich Medical School
Faculty of Medicine and Health Sciences
University of East Anglia**

**RESEARCH STRATEGY
2013-2018**

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Executive summary

The University of East Anglia's has emphasised "research with impact" as a key component of its vision to be a globally strong research university. Norwich Medical School set within this context has a vision to develop a clinical and translational research programme of international standing based on existing strengths of the Medical School, University of East Anglia (UEA), The Norfolk and Norwich University Hospital (NNUH) and all of the Institutes of Norwich Research Park (NRP). This document summarises this strategy but must be seen as an evolving process based on the following goals:

1. Develop internationally competitive priority areas for research
2. Attract excellent researchers from around the globe
3. Implement joint research programmes with partners in the Norwich Research Park and externally
4. Train the next generation of researchers
5. Build additional research space and capacity
6. Monitor our research performance and be prepared to modify our plans to ensure success

The Research Vision

Norwich Medical School (NMS) was founded in 2001. Having established an excellent teaching programme, the Medical School has a vision to build a clinical and translational research programme of international standing based on the existing strengths of the Medical School, University of East Anglia (UEA), The Norfolk and Norwich University Hospital (NNUH) and the Norwich Research Park (NRP). The presence of 3 BBSRC research institutes on the Norwich Research Park (Institute of Food Research (IFR), John Innes Centre (JIC), The Genome Analysis Centre (TGAC) provides unique opportunities not available to other comparable medical schools to have a major impact on the health and wealth of the UK and beyond.

NMS has been given a clear mandate within the University's Corporate Plan to develop excellence in research within the school. In its early years the strengths of NMS research included health policy and practice, psychological science and nutrition. We wish to build on these strengths but also to expand into new areas than take advantage of the research strengths of the NRP as a whole. NMS has recently appointed a new Dean, Professor David Crossman with a clear mandate to improve research. Other drivers include the need to perform well in the Research Excellence Framework (REF) in 2014 that will influence the University's ranking and income.

Our focus is on developing translational research themes that answer important health questions, from an understanding of the basic mechanisms and genetics of disease through to clinical trials and from there to incorporation into clinical guidelines and evaluation within the broader health care community. Preventive medicine is major goal for 21st century medicine. The role diet in the prevention of a wide spectrum of disease will be a particular focus of our research. We will incorporate this with parallel strategies to understand the epidemiology and health economic impact of the conditions studied.

Overall research priorities

The research priorities of the Norwich Medical School have been selected against the criteria of having already achieved international quality or a realistic prospect of achieving international quality over the next 5-year period, as well as contributing towards key themes across the NRP, including food and health, environmental sustainability and healthy ageing.

- Nutrition and health
 - Cardiovascular effects of dietary components
 - Potential health benefits of flavonoids and fatty acids
 - Nutrient requirements for optimal health
 - Bioavailability of micronutrients and phytochemicals
 - Nutrigenomics and nutrigenetics
- Gut health and inflammatory bowel disease
 - Gut epithelial integrity and immune mechanisms in Inflammatory Bowel Disease (IBD) and infective gastroenteritis
 - Novel treatment for inflammatory bowel disease
 - Role of microbiota in disease pathogenesis

- Development of new diagnostics and therapeutics for IBD and gastroenteritis
 - Epidemiology of GI disease
- Bone and joint disease
 - Metabolic bone disease
 - Paget's disease
 - Fracture healing
 - Joint health
- Microbiology
 - Treatment of hospital acquired infections
 - Antibiotic resistance
 - Molecular diagnosis of infection
- Diabetes and endocrinology
 - Prevention of diabetes
 - Adipocyte metabolism
- Epidemiology and Health Geography
 - Obesogenic environments
 - Physical activity behaviours
 - Dietary behaviours
 - Environmental determinants of health outcomes
 - Rurality and access to health care
 - Spatial analysis and mapping
- Clinical Science and Trials
 - Stroke and hypertension
 - Heart failure
 - Asthma
 - Pulmonary fibrosis
 - Magnetic resonance imaging
 - Rhinology
- Evidence Synthesis
 - Publication bias
 - Indirect treatment comparison
 - Network meta-analysis
 - Evaluation of complex healthcare interventions
- Health Economics
 - Cost effectiveness analysis alongside RCTs
 - Social and economic consequences of health and health behaviours
 - Socio-economic inequalities in and determinants of health and health behaviours
 - Economic evaluation of public health interventions
- Health Services Research
 - Randomised controlled trials
 - Observational studies of effectiveness of health care
 - Qualitative research on patients' and professionals' experience of health care
 - Diagnostic accuracy and screening programmes
 - Medical ethics
- Medical Statistics
 - Developing statistical methods within clinical trials

- Genetic epidemiology
- Providing trial statisticians for clinical trials
- Support for the Norwich Clinical Trials Unit
- Support for the Research Design Service
- Primary Care and Epidemiology
 - Patient perceptions of health and illness
 - Shared decision making
 - Health promotion
- Prostate Cancer studies
 - Genetic prognostic factors
- Medical Psychology
 - Child Adolescent Psychosis
 - Dementia
- MR Imaging as an enabling technology for research areas above.

Further information is available at www.uea.ac.uk/medicine/research

Developing research excellence

a. Recruiting high quality researchers

This is a key objective of NMS and will be achieved through careful investment in new posts, creating an awareness of NMS as a centre of research excellence and a comprehensive recruitment policy to identify and attract the best candidates. The Clinical Academic Initiative (CAI) is a joint venture with the Norfolk and Norwich University Hospital established in 2010 to recruit high quality clinical researchers to NMS. This programme should be continued in order to achieve critical mass of clinician scientists from Senior Lecturer to Professorial level in our chosen priority areas. It is supported by the Clinical Academic Research, a scheme funded by the SHA and to be taken on by the Clinical Commissioning Groups, which funds clinical academics at UEA and the University of Cambridge.

b. Developing the Research Environment - New research institutes and research space.

- a. New Medical School Building. This at an advanced planning stage-of-the-art to be situated alongside the NNUH and provide excellent facilities for teaching, research and basic science including a state with a total of about 4000 square metres.
- b. Biorepository to store tissue collected for research including state of the art freezer and retrieval systems
- c. Norwich Research Park Centrum Building. NRP has received a £26 million government development fund and as part of this programme the Centrum Building will provide a unique environment for interfacing with commercial partners and will include office, meeting and research space.
- d. Proposal for an Institute for Food, Health and Gut. An opportunity has arisen out of the need to re-house the Institute of Food Research. The new institute will be science-driven, multi-disciplinary and contain a seamless interface into clinical practice, pharmaceuticals and biotechnology. The institute, with

excellent science at its core, will deliver enhanced understanding of gut biology and function, health promoting bioactive substances in food and molecular aspects of food safety along with leadership in chronic gut disease and taking into account in the scourges of old age; osteoporosis, dementia and wasting disorders such as sarcopaenia.

- e. Ambition to develop NIHR funded Biomedical Research Units in the future for example in Bone and Joint Disease and/or Nutrition and Health

c. Capacity building - Training the next generation of researchers

- a. UEA and NNUH participate fully in the NIHR integrated academic training programme. The Norwich Academic Training Office (NATO) led by Professor Watson, coordinates academic training in partnership with NNUH and the East of England Deanery. The research training of ACFs and clinical lecturers is achieved through the appointment of academic supervisors who mentor each trainee. Performance of all ACFs and CL is monitored through the ARCP process. Trainees are strongly encouraged to apply for training fellowships from the MRC, NIHR and other major funders.
- b. To encourage applicants with research potential the scientific content of the Medical School curriculum is being enhanced. There is active encouragement of research at career days for both undergraduates and junior doctors and the Medical School has developed a one year intercalated MRes programme. Opportunities for medical students to become involved with established research teams are being developed with a view to co-authorship on publications or presentations at conferences. Professor Wileman has been appointed to promote science and research training with the undergraduate curriculum and the facilitate research placements for the medical students.
- c. The Dean's lecture series highlights the research achievements of UEA, NNUH and the wider NRP to the medical students. The Dean has highlighted this lecture series as one of the most important in the medical school calendar. To compliment this lecture series joint UEA/ NNUH Research Seminars are being held on a monthly basis at NNUH.
- d. We are also enhancing our postgraduate research degrees. A Post Graduate school in the Faculty of Health will open in 2013. Strong encouragement and support will be given to winning external studentships for the school and recruiting strong candidates for studentships. The MD degree is being reformed to raise its academic standard to ensure that it is recognised externally and provides sound research training, and we will establish more PhD programmes aimed at clinicians addressing clinical and basic science research questions.

d. Cooperation across Norwich Research Park

UEA and NNUH are part of Norwich Research Park (NRP) a strategic research alliance with the John Innes Centre (JIC), Institute of Food

Research (IFR), The Genome Analysis Centre (TIGAC) and the Sainsbury Laboratory (SL). NRP employs 15,000 people of which 3000 work in science and has the 5th highest science citation score in the UK after Cambridge University, Oxford University, University College London, and Imperial College London. The Partnership is overseen by a board, which forms a limited liability partnership of BBSRC, UEA and NNUH. The component parts of the NRP present a potent force in discovery science (JIC, IFR and UEA) and represents real “untapped resource” for translational and preventive medicine, and UEA with NNUH are positioned to take forward the translational agenda specifically through the Norwich Medical School. Emphasis is placed on securing MRC and NIHR grant funding.

The Norwich Medical School works closely with NNUH. Professor Crossman, head of the medical school sits on the Executive board of the Hospital and Professor Flather is the Director of Research within NNUH.

e. Clinical Research and Trials Unit

The CRTU has already achieved recognition for quality by being awarded UKCRC registration. CRTU has two separate operational arms which need further development (see appendix)

- a. Clinical Trials Unit (CTU) is a grouping of medical statisticians, health economists supported by NMS with expertise and capacity to design and run multicentre trials. The short term goals are to create capacity to run a number of clinical trials and to renew national registration
- b. Clinical Research Facility (CRF) supported by NNUH to enrol patients and run early phase experimental studies. The short to medium term goal is to support key elements of our translational research strategy, develop a national recognised experimental research facility and work with commercial partners to undertake early phase clinical trials

f. Development of Academic Directorates at NNUH

Several Clinical Directorates at NNUH have an academic track record. Those with a recognised senior researcher at Professor level (ideally a full UEA Professor of Medicine, but initially these may be honorary posts) will be able to apply for the title of “Academic Directorate” in agreement with the Executive Management Board of NNUH and the Faculty of Medicine and Health Sciences Executive of UEA. The basic aims will be for NMS to support these directorates by investing in research priorities and training and for high quality research output that can benefit the University’s REF returns.

g. Research management

Efficient research management is a key platform for success. The Research and Enterprise (REN) Department has experienced staff to support all aspects of research. The Faculty of Medicine and Health

Sciences has agreed to pool research related resources with NNUH to increase research capacity.

1. The Deputy Head of School (Research) will chair the research stimulation committee to lead, coordinate and monitor research performance in the NMS.
2. Researchers are organised into research groups each with one or more Professorial lead.
3. The Professorial leads will set the research strategy for group and work with junior colleagues on developing grant applications.
4. Each research group will have a list of potential funding schemes including studentships to which they can apply. REN will have a complimentary group with all the researchers who can potentially apply to each funding scheme. This will enable announcements about funding schemes to be targeted to relevant researchers.
5. Meetings will be set up between research groups in the Medical School and other schools to stimulate new collaborations.
6. There will be an annual one or two day school research meeting with an external distinguished speaker.
7. The research stimulation committee will oversee the school's research web pages.
8. Joint Research Governance Committee to oversee research conduct and review sponsorship issues
9. Joint Research Committee aimed at developing research at NNUH
10. Joint Research Office where members of REN and the Research and Development Office at NNUH work as a single unit to support grant applications, provide accurate and timely financial estimates and review and approve new projects.

h. Maximising grant success

Internal review committees for the MRC, BBSRC, EU, NIHR and Wellcome Trust review committees has been established to critique applications at an early stage and suggest improvements before submission.

i. Research relationships with industry

These are strongly encouraged through close working relationships with the Business development Management team.

j. Research Targets

In line with the University and School's corporate plan there are the following research targets.

1. Each researcher should lead one competitive research application per year of more than £100K or multiple joint applications if relevant.
2. Each researcher should have a minimum of 2 PhD students.
3. Each researcher should publish at a minimum standard 3 three star and 2 star paper within a REF period. (This is reduced according to REF regulations for early career researchers and staff who have career breaks).

Appendix 1

Norwich Research Park: description and capability

NMS: NMS sits in the Faculty of Medicine and Health Sciences of the University of East Anglia along with the School of Nursing Science (NSci) and the School of Allied Health Professionals (AHP) and has five departments within the School: Public health, Nutrition, Psychological science, Medical education and Medicine. NMS has established collaborations with other Faculties in the University especially Science and there are close links for teaching and research with the Norfolk and Norwich University Hospitals NHS Foundation Trust (NNUH) as well as other NHS Trusts including the Primary Care Trust, James Paget University Hospital and Queen Elizabeth Hospital King's Lynn. We are also closely linked to other organisations in the Norwich Research Park and this document integrates key elements with the research strategies of our multiple partners.

UEA: There is relevant research in the Schools of Nursing Science, Allied Health Professions, Pharmacy, Biological Sciences, Ecology and Environmental sciences, Chemistry and Mathematics. In 2011 UEA was ranked within the top 150 universities in the world and has an stated aspiration in its corporate plan to be ranked in the top ten in the UK.

NNUH: In addition to the research strengths mentioned above within the NNUH there are research strengths in diabetes, orthopaedics, ophthalmology and radiology. It is the 8th largest secondary care trust in the UK with little out of region referral, a secondary care catchment area of approximately 850,000 and a high proportion of elderly patients.

Institute of Food Research (IFR): The IFR is a world leader in research in gastrointestinal science, particularly mucosal immunology and the emerging field of gut microbiota. It is comprised of 26 senior scientists, and acts to link research in the area of GI science, diet and health across the NRP.

John Innes Centre (JIC): JIC is an independent, international centre of excellence in plant science and microbiology. Its research comprises wide range of disciplines in the biological and chemical sciences, including cell biology, biochemistry, chemistry, genetics, molecular biology, computational and mathematical biology. A major focus of their work is therapeutic chemicals produced by plants including fruit and vegetables. A number of league tables places the John Innes Centre as the top plant laboratory in the world.

The Genome Analysis Centre (TGAC) is a national genomics and bioinformatics centre which addresses problems in agriculture, sustainable energy, food and nutrition, through novel approaches in genomics and specializing in genomics technology, high throughput data analysis, advanced bioinformatics and innovation.

The Sainsbury Laboratory (TSL), located at the JIC, is a joint venture between the Gatsby Charitable Foundation, the John Innes Foundation (JIF), UEA and the Agricultural and Food Research Council (now BBSRC). Its goals is to make fundamental discoveries in the science of plant-microbe interactions and to build on fundamental scientific research and deliver science solutions that reduce crop losses to important diseases.

Local Community: Norfolk has a stable local population that makes it particularly suitable for long-term cohort studies, such as EPIC Norfolk. There is strong local support for research from local political leaders with involved and committed local community.

Appendix 2:**Norfolk and Norwich University Hospital: Outline Research Strategy**

Mission statement:

To provide every patient with the opportunity to participate in our research to improve care

1. Supporting NIHR research priorities

- a. Increase enrolment of patients into NIHR portfolio research projects
- b. Provide reliable evidence for cost effective treatments to improve care in the NHS
- c. Support high quality industry sponsored research in the NHS
- d. Achieve targets for approval times and recruitment
- e. Key member of NIHR research networks

2. Joint research plan with University of East Anglia and Norwich Research Park Partners

- a. Seamless research links with Faculty of Medicine and Health Sciences (Schools of Medicine, Nursing Science and Allied Health Professionals) and other schools with a bioscience research interest
- b. Develop translational science programmes identifying potential new treatments and better understanding of disease, based on genetic, molecular and laboratory based science
- c. Collaborations with industry partners to develop new ideas and treatments
- d. Increase joint academic appointments
- e. Develop academic clinical departments
- f. Joint research administration through the Joint Research Office
- g. Representation on NRP research and strategy committees
- h. Invest appropriately in UEA/ NRP research strategy

3. Ensuring that we have sufficient resources to carry out world class research

- a. Provide a high quality research environment including space and equipment
- b. Developing a world class clinical research facility (CRF) with expertise in experimental and translational research
- c. Develop research capability in our laboratory and pathology teams
- d. High quality biobank/ biorepository for research tissue samples
- e. Ensuring that clinical data are also used effectively for research

4. Supporting research teams and training the next generation of researchers

- a. Recruit consultants and clinical staff with an interest and track record in research
- b. Ensure staff have protected time for research

- c. Recruit and train research trainees in clinical specialties including physicians, surgeons, nurses, allied health professionals and technical staff
- d. Share and promote the research achievements of staff

5. Achieving strategic research income

- a. Expertise and capacity to bid for strategic grants with NRP partners
- b. High success rate for research income from government, charity and industry
- c. Effective management of research budget with regular review by Joint Research Committee

6. Active Communications strategy

- a. Ensuring research community is informed of research activities and opportunities
- b. Reaching out to patients, public, media and the wider community about research