

**NORTHERN  
IRELAND  
CENTRE FOR  
STRATIFIED  
MEDICINE**

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**NICSM**



## Introduction

**The Northern Ireland Centre for Stratified Medicine (NICSM) has the largest single critical mass of researchers solely focused on stratified medicine in Ireland.**

It has 23 core staff, 36 NHS clinicians affiliated to the research centre and the involvement of NHS Health Trusts. The NICSM has strong interactions with key industry partners, stakeholders and patients in order to have an impact within the economy and society.

The centre aims to identify how our genes or patterns in levels and state of molecules within our bodies, or subtle differences in medical images, could be used to create robust clinical decision making tests for a range of degenerative diseases.

The Centre was established in 2013 following an £11.5M award, to Director Professor Tony Bjourson, from the European Union Regional Development Fund (ERDF) EU Sustainable

Competitiveness Programme for Northern Ireland, alongside partners within the Northern Ireland Public Health Agency (HSC R&D), ILEX and Ulster University. The NICSM is located at the Ulster University's Clinical Translational Research and Innovation Centre (C-TRIC) facility that is embedded in the Altnagelvin Hospital in Derry~Londonderry. We engage with regional development agencies and Derry City and Strabane District Council to promote translation of research and promote inward investment in the health technologies sector.

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## Research focus

The NICSM is focused on developing personalised/precision medicine diagnostic tools for degenerative diseases.

We are creating a federated degenerative disease biobank of samples with integrated clinical data and robust laboratory measures of genomic, proteomic and metabolomic determinants. This resource aims to facilitate the discovery and validation of biomarkers associated with disease predisposition and response to therapy, and ultimately more effective drugs.

The research programme currently includes the recruitment of approximately 7000 patients/ participants and advanced data analytics associated with their phenotypic and 'omic' data to better inform the diagnoses and treatment of disease (particularly those that share a pro-inflammatory aetiology).





## Core values of the NICSM

- Integrating the clinic, lab and data analytics
- Research informed
- International research expertise
- Professional and ethical values



## Education focus

**To ensure that we are meeting the growing demand for graduates in this key health area, two courses have been created; a BSc Hons and an MSc.**

Both courses have close links with external stakeholders including industry, professionals, regulatory bodies and clinicians. Students are provided with innovative and technology-led learning opportunities through lectures, laboratory-based practicals and research projects.

The BSc Hons in Stratified Medicine is the first course of its kind in the UK and Ireland, established in 2014, with 100% of graduates in jobs or further education within six months of graduation.

The MSc Stratified Medicine course is the only course of its kind in Ireland and is a fully online distance learning

course providing exit opportunities at PgCert and PgDip level. This course was accredited by the Institute of Biomedical Science (IBMS) in 2018 demonstrating the validity and importance of this course in the current market.

Upon graduation, practitioners are part of a fast-growing industry – the UK life sciences sector is worth over £50bn and the US Government's 'Precision Medicine Proposal' is worth \$215m. Graduates have a wide skill set covering computational biology, statistics and genomic medicine.



## Stratified medicine

**Stratified, or personalised, medicine, is the ability to provide precision disease diagnosis and treatment at an individual level.**

This new era in medicine will move away from the current 'one size fits all' or blockbuster model and will replace 'trial and error' medical diagnoses and treatment.

Patient response to a particular drug treatment, therapeutic intervention, or standard of care varies widely. For some diseases, as few as 20-30% of patients respond to the standard level of care.

Stratification allows better targeting of treatment to specific disease pathways, better matching of available treatments to particular groups of patients, and co-development of diagnostics to ensure the right patient gets the right treatment at the right time.

# Clinical decision making and patient safety

The NICSM led a €8.6 million cross-border project, funded by the EU's INTERREG VA Programme and managed by the Special EU Programme Body (SEUPB), the Centre for Personalised Medicine; Clinical Decision Making and Patient Safety (CPM).

The Centre for Personalised Medicine, through the use of a research-based medical approach, aims to guide clinical decision making to ensure a patient receives the right treatment at the right time. Recognised as an international priority, this research is undertaking some of the most exciting and advanced research in personalised medicine currently being undertaken globally. The five research clusters within the CPM, use the methods and technologies from personalised medicine and apply them to heart disease, emergency surgery, acute kidney injury, unscheduled care in diabetes and diagnostic accuracy in dementia. These disease areas are associated with significant clinical need and commercial potential.

The CPM has fourteen partners including:

- Ulster University
- Western Health and Social Care Trust
- Letterkenny University Hospital
- Letterkenny Institute of Technology
- University of Highlands and Islands
- NHS Scotland
- National University of Ireland, Galway
- Randox Laboratories and Randox Teoranta
- United Health Group (Optum)
- Clinishare Ltd
- Healthcare Analytics Ltd
- Northern Ireland Clinical Research Services Ltd
- Donegal Research Academy and Clinical
- Translational Research and Innovation Centre.

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