



UNIVERSITY OF  
**LIMERICK**  
OLLSCOIL LUIMNIGH

Health  
Research  
Institute

# Annual Report 2019

fostering and  
delivering health  
research in Limerick  
and nationally

## Table of Contents

<b>MESSAGE FROM THE DIRECTOR</b>	<b>02</b>
<b>INTRODUCTION TO THE HEALTH RESEARCH INSTITUTE</b>	<b>04</b>
<b>MISSION, VISION &amp; GOALS</b>	<b>06</b>
<b>MAIN ACHIEVEMENTS 2019 - AN OVERVIEW</b>	<b>08</b>
<b>RESEARCH GRANTS AWARDED ACADEMIC YEAR 2018-2019</b>	<b>10</b>
<b>RESEARCH EXCELLENCE</b>	<b>12</b>
Awards Spotlight	14
HRI Events	18
Training	26
Support - Biostatistics	27
<b>RESEARCH IMPACT</b>	<b>28</b>
Academic Achievements	29
→ A PhD Profile	30
Research Programme Updates	32
→ Targeting Signaling Pathways in Colon Cancer	32
→ Rapid Innovation Unit	35
<b>PEOPLE</b>	<b>36</b>
Strategic Collaborations	38
HRI Membership	40
Selected Member profiles	41
Investing in our Members:	47
→ HRI Funded Research Clusters update 2019	47
→ HRI Seed-Funding Call update 2019	60
→ New Funding Schemes	70
<b>ECOSYSTEM</b>	<b>74</b>
HRI Clinical Research Support Unit (CRSU)	74
HRI Executive Committee & Operations Team	78
<b>APPENDIX 1: HRI FULL MEMBERS LIST (31ST DECEMBER 2019)</b>	<b>80</b>
<b>APPENDIX 2: HRI-AFFILIATED PAPERS IN 2019 (DECILE 1)</b>	<b>84</b>

Sí Isteach don Ospidéal / Hospital Entrance

# Message from the Director

## Prof. Rachel Msetfi

Welcome to the 2019 annual report of the University of Limerick Health Research Institute. We are delighted that **since 2016 our membership has grown from 60 to 136 full members**, and that we now have 45 members from our affiliate organisations, including the UL Hospitals Group. This year, members have produced an increased number of publications in top decile journals, which are thought to have the highest impact, with **over €11.6 million in research funding awarded** to members in just one year.

A highlight of 2019 has been the formal launch of our research clusters (page 47). Together these clusters represent the work of over 50 HRI members and also represent our priority areas for the next number of years. These areas include Ageing, Cancer and Physical Activity, with Implementation Science and Patient and Public Involvement being foundations for all of our work. In addition, two emerging areas received funding. Both are arts-based health projects - a growing area of health research within the HRI. The clusters are already working at full throttle with intense programmes of activity generating capacity-building and research funding opportunities with a collaborative and inclusive focus. We look forward to seeing all of these clusters go from strength to strength over the coming years, and each will benefit from the feedback of an international advisory panel in 2020.

Although the HRI has priority areas, this does not mean that the themes, which are also representative of the HRI community, are no longer important. The themes of Health Technologies, Lifestyle & Health, Health Services Delivery and Public & Patient Involvement, represent the membership as a whole and allow the Institute to support capacity building in these and other emergent areas. This includes conference funding and open access publication support, as well as seed funding (see page 60). We have also encouraged postdoctoral researchers and

postgraduate students working with full members, to join the Institute, with their number currently standing at 65. These members can avail of many membership benefits, including specific HRI events at UL research week (see page 18) amongst others and we look forward to their continued success.

2019 also saw the official opening of the Clinical Education and Research Centre (CERC) at the University Hospital Limerick campus. This building, jointly funded by UL and the HSE, is the hospital home of the UL Graduate Entry Medical School (GEMS), the HRI and its Clinical Research Support Unit (CRSU). The opening of the building by Minister of State Jim Daly was a great moment for everyone involved from each organisation, who have worked for so many years to make this vision a reality. The building symbolises the importance and the potential of the linkages between clinical education and translational health research.

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Over the last year the CRSU has gone from strength to strength, with over 1000 patients being involved in CRSU-supported studies in the calendar year.

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# from strength to strength

This work has been bolstered by our membership of the HRB funded Clinical Research Coordination Ireland initiative, and the appointment of a Quality and Regulatory post as a consequence. The Unit, led by Marie-Therese Hayes as Clinical Operations Manager, continues to benefit hugely from the 2019 appointment of Prof. Paul Burke as Chief Academic Officer, and his support in bringing hospital clinicians and university researchers together (page 38). The work of the Rapid Innovation Unit, led by Prof. Leonard O'Sullivan (page 35) is an example of what can be achieved when innovation is immersed in clinical practice.

Over the past year the HRI core team, led by Goretti Brady and the HRI theme leads, has hosted numerous events and activities to support the work of HRI members. This has included formal and informal training, seminars, workshops and, of equal importance, the opportunity for members to have bracketed time to engage in discussion, networking and community building.

I am delighted to present you with the 2019 Health Research Institute annual report and I hope that you enjoy finding out more about the work of our members.



PROF. RACHEL MSETFI

# Introduction to the Health Research Institute

The University of Limerick's Health Research Institute (HRI), founded in 2014, has a prime role in fostering and delivering health research in Limerick and nationally. As it continues to develop, both the volume and impact of research undertaken by its members are increasing. The HRI has developed a unique transdisciplinary approach to health research, focusing on translational outputs with direct relevance to health practice, and delivering research excellence and impact in the health domain through a vibrant membership and supportive ecosystem.

The HRI has been built upon the unique blend of research disciplines which has emerged during the development of health-related teaching and activity across the University. These disciplines are encapsulated in our research themes, Lifestyle and Health, Health Services Delivery, Health Technologies, and Public and Patient Involvement. These themes group the Institute's researchers into resonant research areas, with a high degree of inter-theme collaboration and knowledge exchange.

Our research strategy is closely aligned with the strategic goals of the University of Limerick (UL).

In 2018, the HRI provided strategic funding through an externally reviewed competitive process in order to focus and strengthen research activities and impact within its core areas. 2019 saw the launch of these funded clusters, each of which has members from multiple disciplinary areas grouped around a common research programme:

- Health Implementation Science and Technology (HIST)
- UL Cancer Network (ULCaN)
- Ageing Research Centre (ARC)
- Physical Activity for Health (PAfH)

In addition, two emerging research clusters were funded:

- The Creative Process Meets the Creative Product- Enhancing the Performance Artist through Research, Design and Technology: PD+PA (Product Design and Performing Arts)
- Participatory and ARTs based methods for Involving Migrants (PART-IM).

The clusters were tasked with developing their research capacity, enhancing networking and training for emerging researchers, expanding their national and international network, and providing a sustainable research portfolio within each of the cluster areas. An update on each cluster's progress for 2019 is provided in this report.

Building on our strong foundation and benefiting from the development of the new research clusters, the Health Research Institute advances transdisciplinary and interdisciplinary research that will bring about innovative solutions for disease prevention, enhanced healthcare delivery, and will ultimately contribute to the health and wellbeing of the population. Our Clinical Research Support Unit (CRSU), located in the state of the art Clinical Education and Research Centre (CERC) at University Hospital Limerick, propels our collaborative vision and further develops our holistic approach to research.

The 2019 report summarises the achievements of our members, and demonstrates how researchers in the HRI have achieved national and international impact. The report details the HRI support mechanisms, and reviews the new research clusters.





# Mission Vision & Goals

## Mission

The HRI will conduct **outstanding person centred research** to enhance the health and wellbeing of individuals and transform the health environment for the population.

## Vision

The HRI will be an internationally recognised research institute that delivers **excellent research with impact in the areas of Lifestyle and Health, Health Services Delivery, Health Technologies, and Public and Patient Involvement (PPI)**. It will foster a culture of interdisciplinary research collaborations to support discovery and innovation in health and wellbeing while also providing relevant and critical research training.

## Goals

The success of the HRI is based around the achievement of the following **four strategic goals**:

### 1. Research Excellence

Deliver excellent research to establish our reputation as a Health Research Institute

### 2. Impact

Leverage our position as the bridge between clinically based and university based researchers to make an impact on patient health and wellbeing

### 3. People and Ecosystem

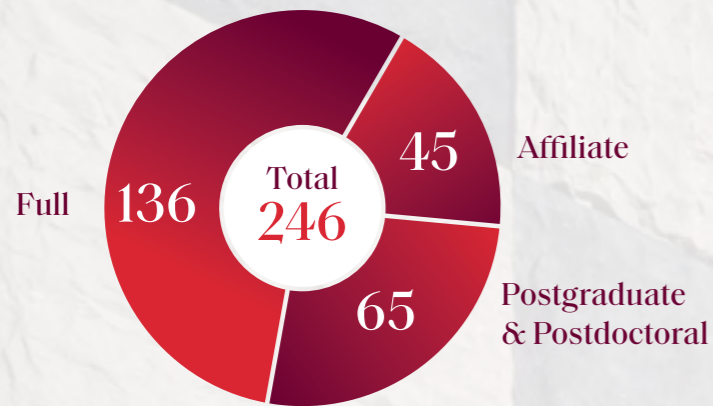
Invest in and empower our people through a culture of excellence and impact

### 4. International Reach

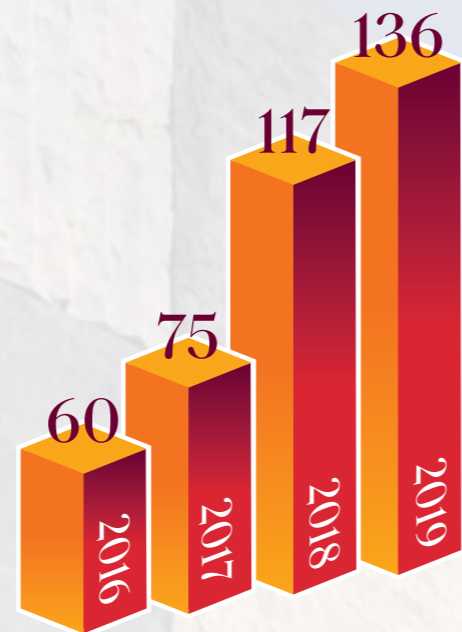
Extend our international reach by engaging in collaborative partnerships and disseminating research

# Main Achievements 2019

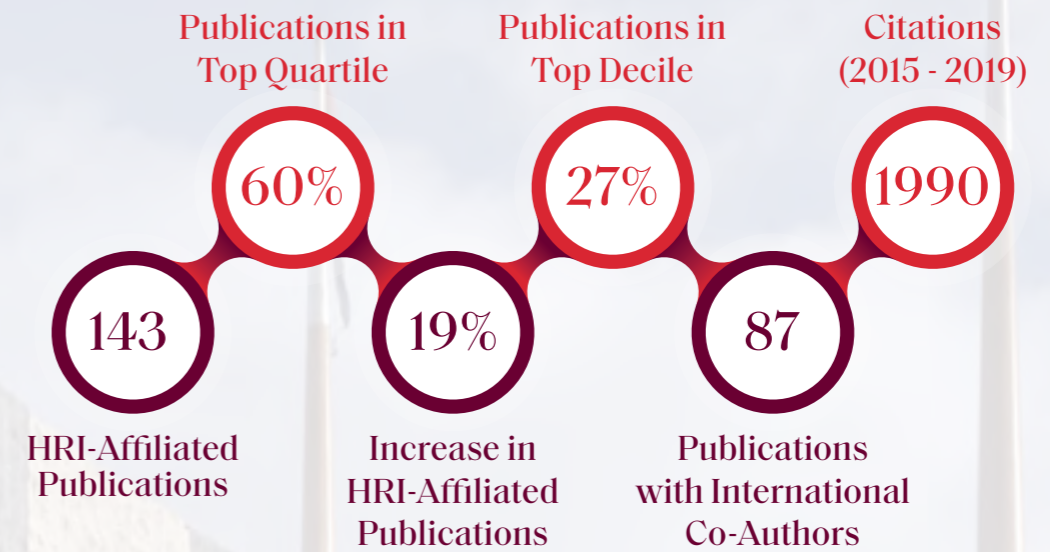
HRI Membership 2019



Full Members 2016-2019



HRI Publications 2019

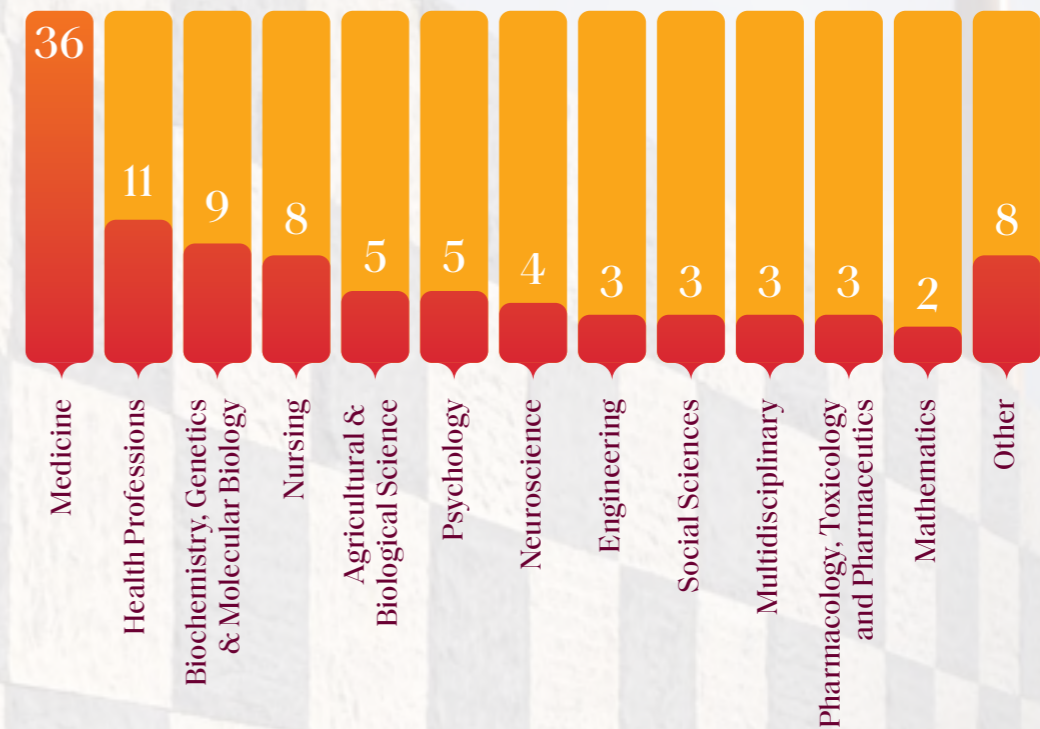


€ 11,606,862  
External Research Funding 2018/2019

Over 1000  
Patients involved in CRSU Studies

62% Increase  
in CRSU Studies since 2018

HRI Publications Top Research Areas 2018



# Research Grants Awarded Academic Year 2018-2019

(>100,000K in value)

Funding Body /Programme	Budget	Description	Project Leader
Bord lascaigh Mhara	€149,509	State-Effect of Blue whiting protein hydrolysate(BII-SPH) supplementation on markers of glycaemic control, metabolic syndrome and appetite in humans	Dick Fitzgerald
Carolan research trust	€390,000	Other-Social Care Caregiving and Trauma Research	Stephen Gallagher
Department of Agriculture Food and Fisheries	€152,641	DAFM-FIBREMET	Eibhlis O Connor
Enterprise Ireland	€262,300	EU/EI-Impact of Processing conditions and composition on the physiochemical and biofunctional characteristics of milk protein Concentrates	Dick Fitzgerald
Enterprise Ireland	€112,839	EI-Development of Safety Valves for Paediatric Urology catheters and three-way urology catheters	John Mulvihill
Enterprise Ireland	€448,354	EI-Spatially referenced characterisation of a patient derived colonic tumour using targeted transcriptomics and cellular biomechanical testing	Kieran McGourty
Enterprise Ireland	€334,243	EI-Statguard Stage 2	Leonard O Sullivan
Enterprise Ireland	€264,229	EI-Exploiting algal cell factories with systems biology for biopharmaceutical production	Maurice Collins
Enterprise Ireland	€230,681	EI-The Determination of the Mechanical Environment of May-Thurner Syndrome	Michael Walsh
European Union	€740,562	EU-CityXchange	Stephen Kinsella
Health Research Board	€119,837	HRB-Area Level deprivation and funding equity in public hospitals in Ireland: and examination of hospital groups and activity based funding	Cathal Walsh
Health Research Board	€282,677	HRB-PEN Policy Evaluation Network	Catherine Woods
Health Research Board	€311,817	HRB-A physiotherapist led intervention to Promote Physical Activity in Rheumatoid Arthritis-a pilot study (PIPPRA)	Norelee Kennedy
Health Research Board	€395,007	HRB-Collaborative Doctoral Awards	Rose Galvin



**82 awards**  
granted in 2019



**€11,606,862**  
Value of awards  
2018/2019



**€4 million**  
increase in research  
funding since 2017/2018

Funding Body /Programme	Budget	Description	Project Leader
Health Service Executive	€190,319	Other-General Practice Academic Clinical Fellowship Programme 2018	Liam Glynn
Industry	€644,800	Industry-Health in a Box	Adam De Eyto
Industry	€109,889	Industry-Spatially referenced characterisation of a patient derived colonic tumour using targeted transcriptomics and cellular biomechanical testing	Kieran McGourty
Irish Research Council	€160,266	IRC-Relationships on the River	Orla Muldoon
National Council for Special Education	€849,7600	Other-Speech and Language Therapy Support services for Schools	Sue Franklin
National Council for Special Education	€108,000	Other-The provision of Speech and Language Therapy support services for Schools-Travel and Expenses	Sue Franklin
National Council for Special Education	€101,091	Other -Demonstration Project Speech and Language Therapist Clinical Lead	Sue Franklin
HSE	€184,860	Other-Characterising Emergency Department attendees: A National Study	Rose Galvin
Science Foundation Ireland	€125,072	SFI-Photonic Sensor for Brachytherapy Dosimetry	Sinead O Keeffe
Science Foundation Ireland	€3,299,011	SFI-CRT-AI	Tiziana Margaria
<b>Total</b>	<b>€9,967,765</b>		

\*In total, HRI's research income for the AY 2018/2019 was €11,606,862. Grants valued at over €100,000 accounted for €9,967,765. The remaining €1,639,097 was comprised of IRC GOI PG scholarships, HRB Summer Studentships (incl. TMRN), HRB KEDS award, HRB Conference and Event Sponsorships, EI H2020 coordinator supports and feasibility grants, Marie Curie co-funds and Industry grants. This data is collated from the Full HRI membership list.

# Research Excellence

delivering research excellence and impact in the health domain through a vibrant membership and supportive ecosystem





# Research Excellence Awards Spotlight 2019

## Industry-funded: Health in a Box

Funder: **Johnson & Johnson**

The School of Design (Design Factors Research Group) has a strong track record in User-Centred Design and Design for Health Research. The Health in a Box programme was developed in partnership with Johnson & Johnson, the world's largest and most broadly based healthcare company.

The objective of the Health in a Box PhD programme is to research, develop and design user-centred products, systems and/or product service systems that provide exemplars for innovation in digital / physical product ecosystems related to distributed Healthcare delivery, Industry 4.0 and Consumer Wellbeing. Essentially, the programme is researching the future of global healthcare delivery.

Four PhD candidates were selected to work closely in a studio-based team, which focuses on the Health in a Box sub-themes. Each candidate is progressing their own PhD research project with individual joint supervision from UL academic and industry supervisory teams.

The research is taking a mixed methods approach to design-led and practice-based design research in the global health and healthcare space. The sub-thematic areas being researched include:

- *Regenerative Transitions- A systems orientated design approach to the development of bioregional health & wellbeing* - **Diarmaid Upton**, supervision by Dr A de Eyto, Dr Y Bakirlioglu & E Armstrong.
- *Towards the development of a patient centric, transition from paediatrics to adult healthcare through a User-Centered Design Approach* - **Grace Gilmore**, supervision by Dr L Kiernan & Dr E White.
- *Towards Universal Health Coverage: Improving community health workers' effectiveness in Sudan using a user-centered design approach.* - **Muiz Siddig**, supervision by Dr M McMahon, Dr K Morrissey & D McInerney.
- *A vision for pre-hospital care EMS system for an Indian smart city (Gandhinagar) 2030* - **Vipul Vinzuda**, supervision by Dr L O' Sullivan, M Cuddihy, N Deloughry.



**Dr Adam de Eyto**  
Head of School of Design

## Nationally-funded: Effect of blue whiting protein hydrolysate (BII-SPH) supplementation on markers of glycaemic control, metabolic syndrome and appetite in humans

Funder: **Bord Iascaigh Mhara (BIM, project No. 18/SRDP/002)**

The marine environment is a sustainable source of high quality dietary protein. These proteins can be harvested in the form of protein hydrolysates (PH) which are obtained following enzymatic hydrolysis using food-grade enzymes. These PHs not alone act as a source of dietary Nitrogen and essential amino acids but also contain short protein sequences, known as peptides, which have bioactive properties with the potential to enhance numerous physiological functions. *In vitro* and *in vivo* studies indicate that protein hydrolysates from blue whiting (BW, *Micromesistius poutassou*), an underutilised fish species, possess different biological activities, e.g., anti-diabetic activity. This research involves characterisation and valorization of the techno- and biofunctional properties of BWPHs as food ingredients for human health enhancement.

The project involves the following key tasks:

- Generation and in-depth physicochemical and technofunctional characterisation of BWPHs.
- Assessment of *in vitro* bioactive properties, e.g., antidiabetic potential, of BWPHs.
- Fractionation and identification of the bioactive peptides in a selected BWPH.
- Performance of acute and chronic human intervention studies at University of Ulster Coleraine (UUC) to assess the effect of BWPH supplementation on biomarkers of satiety, weight management and glycaemic control in overweight and obese participants.

This project involves Bio-Marine Ingredients Ireland (BII) as an industrial partner and collaboration with Drs Emeir McSorley and Phillip Allsopp (principal investigators) and Dr Mary Slevin (research scientist) at the University of Ulster Coleraine (UUC) along with Dr Neda Khatib (research scientist) and Prof. Dick Fitzgerald (overall project coordinator) at UL.



**Prof. Dick Fitzgerald**  
Department of  
Biological Sciences

Internationally-funded:  
**Impact of processing conditions and composition on the physicochemical and biofunctional characteristics of milk protein concentrates (MPCs)**

Funder: **EU Horizon 2020 Research and Innovation Programme under the Marie Skłodowska-Curie Career-FIT in association with the Dairy Processing Technology Centre, (Enterprise Ireland grant No. 713654)**

Mohammadreza has a BSc from Shiraz University (2008, Iran) and an MSc from Isfahan University of Technology (2010, Iran) in Food Science and Technology. He graduated with a PhD in Bioscience Engineering (Department of Microbial and Molecular Systems) from Katholieke University of Leuven (2015, Belgium). He subsequently worked for ~1.5 years as a research associate and a post-doctorate in the UK (Imperial College London) and Iran (University of Tehran) followed by 3 years as an Assistant Professor in Shiraz University. Mohammadreza began his Marie-Curie Fellowship at the University of Limerick (Ireland) in January 2019. During his education, research and academic career to date, he has secured several research grants from private and public funding agencies. He has published more than 35 peer-reviewed articles and holds a US Patent.

**Prof. Dick FitzGerald (principal investigator), Department of Biological Sciences**

The demand for high quality protein is driven by increasing consumer awareness of the role of dietary protein in human health. The dairy industry plays a key role in providing high quality protein ingredients to global consumers. Milk protein concentrate (MPC) is one such ingredient containing both casein and whey proteins which has a range of applications in nutritional beverages and bars, in infant formula, etc. However, inconsistencies in its technofunctional properties (in particular low solubility) restrict the widespread application of MPCs in food formulations. Therefore, various approaches are employed to enhance MPC solubility either by modification of the production process or by changing the composition of the raw material manufactured into MPC. These modifications may impact the nutritional quality (including the digestibility and the biological activity) of subsequent consumer end-products. Therefore, this research project investigates:

- a) The impact of process and composition modification on the technofunctional properties of MPC.
- b) Development of correlations between process/composition modifications and the nutritional properties of the proteins, e.g., protein digestibility and amino acid composition.
- c) The development of prototype MPCs with enhanced consistency, solubility, digestibility and biofunctional properties.



**Dr Mohammadreza Khalesi**  
*Marie Skłodowska-Curie Research Fellow*



# HRI Events 2019

During 2019, the HRI hosted and participated in a broad range of activities each of which was positioned to help deliver on our four strategic goals.

The events proved to be a critical mechanism in further expanding our multi-disciplinary networks and in the development of our relationships and collaborations with clinical partners and other external stakeholders, both locally and nationally.

Most events were held in the University of Limerick (UL) and in the CERC (Clinical Education and Research Centre) Building at University Hospital Limerick (UHL). HRI also participated in national events, and hosted invited national and international speakers locally.

The HRI hosted its second Research Day as part of UL Research Week in December 2019. The day's events focused on:

**“The conduct of outstanding Person-Centered Research to enhance the Health and Wellbeing of individuals and transform the Health Environment for the population”**

This year we again welcomed over 100 delegates from a variety of disciplines.

We were delighted to welcome Dr Anne Costello, Project Officer at the Health Research Board who delivered the keynote address on the subject of:

**“The revised HRB Health Research Careers Framework and the achievements of the Research Careers to-date”**

Dr Costello facilitated a lively and interactive Q&A afterwards.

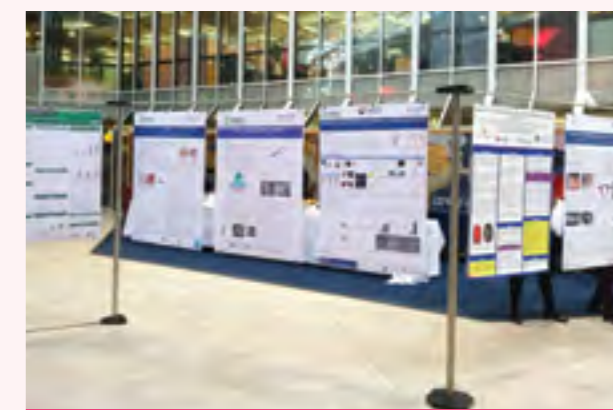
As mentioned in the introduction, in 2018 the HRI embarked on a significant investment in capacity-building research through clusters working on specific projects aligned with the HRI Research Themes\*.

Presentations from the 6 successful research cluster leads, detailing progress to-date and how this strategic investment is successfully delivering with respect to impact and capacity building, were delivered on the day.

\* HRI Research Themes - Health Technologies, Lifestyle & Health, Health Services Delivery, Public & Patient Involvement.



L-R: Ms Goretti Brady, HRI Operations Manager; Dr Anne Costello, Project Officer, Health Research Board; Dr Imelda Doolan, HRI Research Funding Officer



Poster display – HRI Research day 2019



Prof. Paul Murray, Professor of Molecular Pathology and ULCaN (University of Limerick Cancer Network) Co-Investigator presenting at HRI Research Day 2019



Prof. Helen Phelan, Professor of Arts Practice at the Irish World Academy of Music and Dance and lead of the PART-IM (Participatory and ARTs-Based Methods for Involving Migrants) research cluster



Dr Louise Kiernan, lecturer in Product Design & Technology and lead of the PD + PA (Product Design and the Performing Arts) research cluster



Prof. Alan Donnelly, Department of Physical Education and Sport Sciences and lead of the PAfH (Physical Activity for Health) research cluster presenting at HRI Research Day 2019



Prof. Alice Coffey, Professor of Nursing and lead of the HIST (Health Implementation Science and Technology) research cluster presenting at HRI Research Day 2019

## HRI Research Day 2019 (continued)

An inter-disciplinary focus is a key driver for the HRI and so we hosted a session bringing together all UL research Institutes and Centres to present on respective overviews. The aims were to increase awareness of all campus research activity, the supports available for our researchers and to stimulate the consideration of increased inter-disciplinary collaboration. HRI was joined by HRI Members Dr Ciara Breathnach, Senior Lecturer in History, UL and Dr Sara Hayes, Lecturer in Physiotherapy, UL who each spoke of their research activity, success to-date and the importance of collaboration.

Postgraduate and Postdoctoral poster displays and elevator pitch presentations, illustrating a broad range of subject material and collaborative efforts, formed a key element of the day. Dr Costello awarded 7 prizes, with the judging executed by a panel of academic colleagues representing the HRI Research Themes.

### Prize Winners:

#### HRI Poster Display

- 1st Prize** Daniel Moran, *School of Engineering*
- 2nd Prize** Thérèse Leahy, *Physical Education and Sport Sciences*
- 3rd Prize** Aisling Ross, *School of Engineering*

#### HRI Elevator Pitch Presentations

- 1st Prize** Chloe Forte, *Physical Education and Sport Sciences*
- 2nd Prize** Joanne Nolan, *Graduate Entry Medical School*
- 3rd Prize** Mairéad Conneely, *School of Allied Health*

#### Tweet of the day

Dr Ann-Marie Morrissey,  
*School of Allied Health*



Dr Anne Costello presenting Daniel Moran with 1st Prize for his poster



Dr Anne Costello presenting Chloe Forte with 1st Prize for her Elevator Pitch Presentation



Dr Anne Costello presenting Dr Ann-Marie Morrissey for Best Tweet of the day

Increasing awareness of all campus research activity

## HRI Members' Lunches

The HRI hosted eight Members' lunches during 2019. These normally take place on a monthly basis during each semester and are key dates in our calendar. This forum is instrumental in facilitating researcher networking, highlighting research work, sharing knowledge and best practice and supporting collaborations. It also provides the opportunity for lively discussion and debate. We hosted a mixture of local, national and international speakers during 2019.



Prof. John Saxton, Northumbria University presenting on *Exercise versus Cancer: from prehab to rehab*

## PPI\* Summer School 2019

The HRI was proud to once again be involved in the organisation of the renowned PPI Summer School, which is a HRI priority each year. The fourth PPI Summer School, supported by Health Research Board funding, took place 13-14 June 2019. This was the best-attended Summer School to-date, and all feedback was overwhelmingly positive.

Professor Jennie Popay, Lancaster University UK gave an excellent and engaging plenary about 'Effecting and Evaluating Policy Change for Public Involvement in Health Research'. The closing panel discussion, chaired by Dr Anne Cody from the Health Research Board, explored key national developments in training initiatives. The annual BBQ was a lively event with plenty of discussion and networking.

\* Public and Patient Involvement

# Broadening Our Reach

## Official Opening of the CERC building at University Hospital Limerick



L-R: Prof. Rachel Msetfi; Dr. Rose Galvin; Ms. Maria Bridgeman; Ms. Miriam McCarthy, HSA Manager; Prof. Paul Burke; Prof. Colette Cowan, and Dr. Eoin Noctor



Prof. Paul Burke, Chief Academic Officer (CAO) and Vice Dean of Health Sciences



L-R: Minister of State Jim Daly; Ms. Colette Cowan; Prof. Rachel Msetfi, Prof. Paul Burke

On December 9th 2019, Minister of State Jim Daly visited University Hospital Limerick to officially open the Clinical Education & Research Centre (CERC), where the HRI Clinical Research Support Unit (CRSU) is located - a partnership between UL, the UL Hospitals Group and HSE Mid-West Community Healthcare. The Health Sciences Academy (HSA) was also launched at this event. This event perfectly illustrated the intense focus on authentic collaboration and the interplay of key stake-holders and influencers in the healthcare arena, in the Mid-West.

As well as the Minister of State, speakers on the day included: Prof. Colette Cowan, Chief Executive Officer UL Hospitals Group; Prof. Rachel Msetfi, Executive Dean, Faculty of Education & Health Sciences and Director, Health Research Institute; Prof. Paul Burke, Chief Academic Officer (CAO) and Vice Dean of Health Sciences; Dr. Rose Galvin, Senior Lecturer in Physiotherapy and HRI Theme Lead; Ms. Maria Bridgeman, Chief Officer HSE Mid-West Community Healthcare; Dr. Eoin Noctor, Consultant Endocrinologist, UHL

## University Hospital Limerick Grand Rounds

Grand Rounds is a weekly event held in University Hospital Limerick, hosted by HRI Member Prof. Austin Stack, Professor and Chair of Medicine (Graduate Entry Medical School), UL & Consultant Nephrologist, UHL. This is a forum for medical, scientific and clinical education where a variety of topics is presented to health care practitioners. In October 2019, the HRI had the opportunity to showcase its Clinical Research Support Unit (CRSU) in this forum. UL Principal Investigators and HRI Theme Leads Prof. Michael Walsh and Dr. Rose Galvin gave an overview of their involvement with the CRSU in relation to their ongoing studies.

Ms. Goretta Brady, HRI Operations Manager gave some background to the HRI including benefits of Affiliate Membership for colleagues in partner organisations. Clinical Nurse Manager Ms. Slobhan Egan outlined the role of the Clinical Nurse Manager in the research setting and Ms. Marie-Thérèse Hayes, CRSU Clinical Operations Manager gave an overview of the CRSU and the support services offered to the HRI research community.

## International Clinical Trials Day



To help mark International Clinical Trials Day nationally the HRI attended the HRB - Clinical Research Coordination Ireland launch of "Enabling Ireland as a Clinical Research Leader" on May 13th in the Mansion House Dublin. Besides the opportunity to network, the HRI raised its profile by displaying posters detailing selected studies from the CRSU.

## International Clinical Trials Day



International Clinical Trials Day (ICTD) is globally observed and provides the clinical research community with a unique opportunity to raise awareness of clinical trials. Colleagues working in the HRI Clinical Research Support Unit (CRSU) based at UHL along with representatives from a number of clinical research areas in UHL, celebrated the day on May 20th in the main hospital by showcasing clinical research activity, supports availability and the potential for collaboration.

The CRSU team delivered a number of short, taster courses on Good Clinical Practice during the day.

**(Above Left) L-R:**  
Ms Collette Devlin, Ms Siobhan Egan, Ms Fiona Leahy, Clinical Nurse Managers, Ms Marie- Thérèse Hayes, CRSU Clinical Operations Manager and Ms Rita Hinchion, Clinical Nurse Manager. ICTD at UHL May 20th 2019

**(Above) L-R:**  
Ms Marie-Thérèse Hayes, CRSU Clinical Operations Manager, Ms Goretti Brady, HRI Operations Manager and Ms Siobhan Egan, Clinical Nurse Manager celebrating International Clinical Trials Day at UHL on May 20th 2019



## PPI Ignite@ UL Research Fair

PPI Ignite@UL funded by the Health Research Board and the Irish Research Council focuses on participatory approaches to involving patients and the public in health research. As part of this, involving patients and the public in *setting research priorities* is important.

A Research Fair was incorporated into the UHL Grand Rounds, held in the Clinical Education and Research Centre (CERC) building on May 10th 2019. The event, attended by approximately 50 delegates, was designed to bring community and patient organisations, UHL clinicians and UL academics together to learn about each other's work to see if they could form new research partnerships. The HRI Research Cluster leads presented details of their research programmes, which were very well received.

# Training

The HRI conducted a number of training workshops throughout the year:

## The Critical Appraisal Skills Programme (CASPIR)

The CRSU team held a series of CASPIR workshops during 2019, introducing tools for critical appraisal of a wide range of research including systematic reviews, randomised controlled trials, qualitative studies, cohort studies or case-control studies.

These workshops took place five times during 2019 with staff from both UL and UHL attending. Bespoke training was facilitated for fourth year Nursing and Midwifery students in UL. All workshops were organised and led by Clinical Nurse Manager Siobhan Egan, pictured opposite.



## Good Clinical Practice (GCP)

GCP is an international ethical and scientific quality standard for the design, conduct, performance, monitoring, auditing, recording, analysis and reporting of clinical trials. It also serves to protect the rights, integrity and confidentiality of trial subjects and their data. The CRSU ran four courses in 2019, training over fifty participants. The course uses a practical focus on group activities and gives many opportunities for discussion and questions. Participants received a Certificate of Attendance, which is valid for two years and demonstrates each participant's evidence of GCP Training for regulated research studies. A number of tasters of Good Clinical Practice were also delivered as part of International Clinical Trials Day.

## Funding

Throughout the year, the HRI Research Funding Officer, in collaboration with colleagues in the Research Office, hosted a number of information workshops in relation to external funding calls.

These included:

- The HRB Secondary Data Analysis Projects (SDAP) 2019.
- SFI Frontiers for the Future Projects (FFP).
- H2020- SCI Health, Demographic change and Wellbeing information session.
- HRB Definitive Interventions and Feasibility Awards (DIFA) 2020.



## Support-Biostatistics

During 2019, Dr Ali Sheikhi, HRI Senior Biostatistician, worked with over fifty researchers across the University of Limerick (UL), University Hospital Limerick (UHL) and other Health Service Executive (HSE) entities in various capacities.

In addition to the Biostatistician providing statistical advice, being an active member of study teams and a co-applicant for funding applications, the HRI recognized during 2019 that training provision of statistical skills plays an essential role in a researcher's career, equipping them with the requirements needed to effectively include biostatistics in their studies. The demand for this training was also evident.

Therefore, we are preparing to conduct a series of statistical workshops for interested researchers in the coming year, introducing the most important statistical techniques in research, and also illustrating how to use key statistics software packages in order to run analyses.

To ensure that this new HRI service is directed in the most effective and useful manner possible we will actively invite feedback from all of our researchers on a consistent basis, thus driving continual improvement in this critical area.

# Research Impact

contributing to the health and wellbeing of the population



## Academic Achievements

HRI Members supervised a significant number of PhD's during 2019

53

Doctoral Degrees  
Awarded

11

Masters Degrees  
Awarded

6

PhD  
(Graduate Entry  
Medical School)



# A PhD Profile

Mr Brendan O’Keeffe, PhD Researcher,  
Department of Physical Education and Sport Sciences

Supervisor: Prof. Alan Donnelly.

## Examining the health-related fitness of Irish adolescents: The Youth-Fit project

Recently I successfully defended my thesis focused on examining the health-related physical fitness of Irish adolescents. Health-Related Physical Fitness (HRPF) has recently emerged as among the most powerful predictors of future health in youth.

Despite World Health Organisation recommendations, and unlike several countries internationally, the Republic of Ireland lacks a clearly specified strategy for monitoring the HRPF levels of adolescents. Therefore, the primary aim of the Youth-Fit project was to develop a pedagogically sound and scientifically rigorous HRPF test battery, and web-based platform, to facilitate monitoring key markers of adolescent health in school settings.

This project, funded by the Irish Research Council, involved four distinct periods of data collection, including:

- an examination of current physical fitness monitoring practices in secondary school-based physical education programmes nationally (O’Keeffe et al. 2020a);
- an investigation of the test-retest reliability of a peer facilitated approach to administering fitness tests in schools (O’Keeffe et al. 2020b);
- the delivery of a HRPF test battery to 1215 adolescents (age 13.4±.41) from a randomised and stratified sample of 20 schools (O’Keeffe et al. 2020c), and the design of a web-based platform to facilitate large-scale collection and transfer of HRPF results to a centrally hosted database;
- and finally, a systematic evaluation of key stakeholders experiences of the Youth-Fit test battery and software platform (O’Keeffe et al. 2020d).

The Youth-Fit project represented the first comprehensive review of HRPF among a stratified sample of Irish adolescents. Key findings included the disparity in fitness levels between participants in designated disadvantaged (DEIS) schools in comparison to participants in non-disadvantaged schools. Participants in DEIS schools ran an average of 17 fewer shuttles (20m shuttle run) and jumped (standing broad jump), on average, 14 centimetres (cm) less than participants in non-DEIS schools. When compared to age-matched European norms, Irish adolescent girls had significantly higher cardiorespiratory fitness. However, European adolescent boys and girls had significantly higher muscular strength (handgrip strength and standing broad jump) scores. The findings suggest that interventions aimed at improving the physical fitness and activity levels of Irish youth should include a focus on muscular fitness. Furthermore, future interventions designed to promote healthy lifestyle behaviours among school-going populations should give special consideration to students in designated disadvantaged schools.

Positive feasibility benchmarks including recruitment capability, data collection procedures, resources, and participant responses, indicate that the Youth-fit test battery and software platform represents a feasible, pedagogically sound and scientifically rigorous approach to monitoring HRPF among adolescent populations.

For further information on the project please contact [Brendan.okeeffe@ul.ie](mailto:Brendan.okeeffe@ul.ie).



L-R: Ms Lorraine Scanlon, PE Teacher and students from St Michael’s College, Listowel Co. Kerry with Mr Brendan O’Keeffe, PhD Researcher, Department of Physical Education and Sport Sciences, UL. This was one of the twenty schools involved in the Youth-Fit Project.

# Research Programme Updates

## Targeting Signaling Pathways in Colon Cancer

Cancer persists as one of the biggest concerns in modern life and is a huge strain on patients, families and health care systems. Inhibiting cancer metastasis remains one of the biggest challenges facing scientists today but is the most likely way to produce a rapid and positive impact in the fight against this disease.

Dr Pat Kiely's research group in the Graduate Entry Medical School (GEMS) has recently completed a Science Foundation Ireland (SFI) funded research programme aimed at advancing the understanding of colon cancer; in particular, studying how signaling pathways are assembled to promote cell migration in cancer cells. Cell migration is a tightly regulated fundamental process that is mediated by significant cross talk between growth factor receptors and adhesion complexes on the cells surface that function to transfer key information into the cell in a highly coordinated manner. In cancer cells, the signaling pathways directing cell migration become dysregulated. Even subtle changes in the expression pattern or in

the activity of signaling proteins can have dramatic consequences for their activity and localisation and subsequent behaviour of cancer cells.

Dr Kiely's team set out to design and build novel experimental models to identify how and why proteins are scaffolded on signaling 'hubs'. Using a series of synergistic cellular and molecular approaches and mechanisms such as 3-Dimensional culture systems and live cell monitoring, his group identified several novel RACK1 interacting proteins and unraveled how the spatiotemporal organisation of these signaling proteins regulate the events underpinning the cell migration process.



Dr Pat Kiely, Senior Lecturer in Molecular Sciences and Principal Investigator of the Laboratory of Cellular and Molecular Biology in GEMS, University of Limerick

His group characterised many of these interactions in cancer cells, and working closely with Professor Calvin Coffey in GEMS and Professor Jacintha O'Sullivan (Trinity College Dublin), examined how the expression of some of these signaling proteins in colon cancer tissue correlates with disease progression. As part of the project, and in collaboration with Professor Lasse Jenner (University of Aarhus), his group purified and characterised for the first time the human form of Elongation Factor 2. The findings of the project have been published in Cellular Signaling, Cancers, Protein Expression and Purification and Biochemical Society transactions and the group have several further publications in preparation.

Speaking about the project, Dr Kiely believes that this work has identified several potential prognostic markers and therapeutic targets in colon cancer and the results of the approaches and screens carried out during the project will form the basis of many novel projects into the future. Dr Kiely stressed the importance of designing and building novel techniques and approaches to studying cancer, highlighted the importance of collaboration and is very grateful to SFI for funding this work. Some of the tools that his group have used and developed during this project have allowed them to collaborate with other National and International researchers, and have contributed to published findings led by researchers at NUI Galway (Nature Communications,

2018), The University of Glasgow (Future Science, 2019) and UCD (International Journal of Cancer, 2017). Dr Kiely believes that the University of Limerick provides an excellent environment for PhD students and postdoctoral researchers to train and develop and said,

*"What makes me most proud is seeing what the researchers in my group go on to achieve after their training in UL."*

The researchers working on this project have gone on to secure very prestigious fellowships; Dr Maeve Bailey-Whyte secured a place on the NIH Cancer Prevention Fellowship Programme and is based at the NIH in Bethesda; Dr Beatrice Malacrida is working as a postdoctoral researcher at the Bart's Cancer Institute in London and Dr Sheri Hayes is working as a scientist in Regeneron Pharmaceuticals, Limerick.

Dr Kiely is Senior Lecturer of Molecular Sciences in GEMS, UL and is a member of the HRI and Bernal Institute. Dr Kiely is the leader of the University of Limerick Cancer Network (ULCaN), a HRI funded research cluster designed to develop a research-focused infrastructure to facilitate project design and development between multidisciplinary teams working along the 'The Cancer Journey'.



# The Rapid Innovation Unit (RIU)



**Principal Investigator**  
Prof. Leonard O'Sullivan

**Project description**

The Rapid Innovation Unit (RIU) is based on a transformative approach to medical device innovation and design.

RIU utilises a combination of clinical immersion and a network of local clinical collaborators to identify and validate healthcare opportunities for innovation. The approach is founded on using 3D printing as a method to rapidly develop and iterate design concepts, as well as to produce functional customised devices for clinical evaluation. As one of the first hospital-campus based innovation units, the RIU model is aimed at reducing the significant lead-time associated with the traditional design and manufacturing supply chains in healthcare.

RIU is funded through the SFI CONFIRM smart manufacturing centre hosted in UL, with support from local medical devices industry partners, and is aligned with the Design Factors Research Group in the School of Design.

**Progress to date**

The lead medical device designers in the team, Kevin J. O'Sullivan and Dr Aidan O'Sullivan, have been working closely with clinical stakeholders across the UHL group, performing clinical immersion and responding to specific healthcare challenges where current solutions are not available.

A structured programme to train healthcare staff on design approaches for identifying novel problems and designing solutions has been developed, with the aim of creating and fostering an 'ecosystem of innovation' within the hospital.

**Future work**

RIU will rapidly be expanding its activity in, and engagement with, UHL over the coming year. This includes the roll out of collaborative design workshops, further clinical immersions in new clinical areas, and further collaboration with staff exploring new healthcare challenges.



# People

strategic collaborations,  
knowledge sharing and  
enhanced opportunities for  
research funding success

# Strategic Collaborations

## A profile:

Professor Paul Burke, Chief Academic Officer (CAO) and Vice Dean of Health Sciences

### Background

Prof. Paul Burke was appointed Chief Academic Officer (CAO) and Vice Dean of Health Sciences in October 2019, having been a General and Vascular surgeon in St John's Hospital and the UL Hospitals Group (ULHG) since 1994. Prof. Burke was the Clinical Lead and Director of the Reconfiguration of Surgical and Emergency services in the Midwest between 2008 and 2011. This led to the building of the new Critical Care Block at University Hospital Limerick and subsequent development of the new Emergency Department. He has been Chief Clinical Director and Acting Chief Academic Officer for the ULHG since 2016, prior to taking this formal appointment as CAO. Prof. Burke has chaired the management board of the Clinical Education Research Centre (CERC) during the final phases of its development and since its opening in December 2016. He has also been a member of the Clinical Research Unit Management Board since its inception, and acted as its Chair during 2019. The Clinical Research Unit represents the collaboration between ULHG and UL with respect to clinical research support, service and development and is housed in the HRI- Clinical Research Support Unit in the CERC building. Consequently, he has been actively involved in the development of the educational facilities for UL students at the UHL campus and in encouraging and facilitating clinical trial research between Hospital Clinicians and their scientific partners at UL.

### CAO Role

The CAO is a member of both the Executive Management Team of the Hospital Group and the Faculty of Education and Health Sciences. He also works closely with the Head of the Graduate Entry Medical School and the office of the Vice-President of Research in aligning the two organisations to capitalise on their respective strengths and expertise.

The potential benefits and opportunities that strong links between the two partners can create will hopefully lead to the development of an Academic Health Science System as outlined in the Higgins Report of 2013. This outlined how questioning and critical appraisal of established knowledge and the provision of new ideas, can bring about improved patient care. All this contributes to a culture of high quality clinical services, and potential contributions to international healthcare research.

Since taking up his formal role as CAO, he has overseen the recent launch of the Health Sciences Academy (HSA), representing a partnership between the ULHG, UL and the Mid-West Community Health Organisation (CHO).



**Professor Paul Burke**  
Chief Academic Officer (CAO) and  
Vice Dean of Health Sciences

Working closely with the HSA Manager Ms Miriam McCarthy, the HSA has begun the facilitation of interactions between the three partner groups in the areas of Diabetes Care in the Community, the Limerick Cancer Research Project and the Equality and Inclusion theme.

He has also been actively involved with the Head of the Graduate Entry Medical School in promoting the concept of closer interaction between new hospital consultants and the University through the development of more consultant posts with a defined academic commitment in line with the model of the Academic Health Science System which all are keen to promote going forward.



# HRI Membership

During 2019, the HRI membership continued to grow, showing a net increase of 28%.

HRI membership consists of three categories:

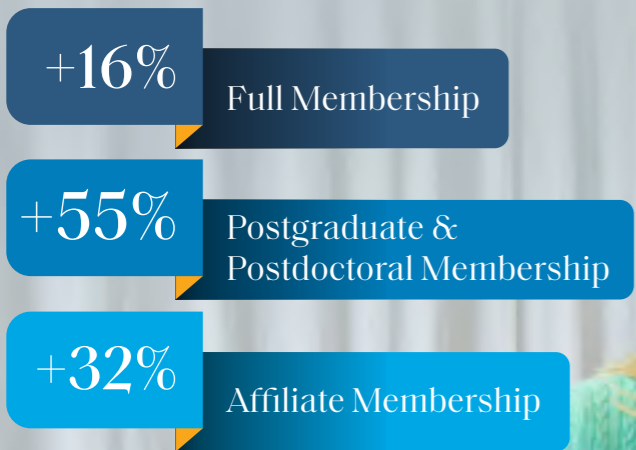
- **Full membership:**  
Full-time, Permanent, Academic members of staff at the University of Limerick.
- **Postgraduate and Postdoctoral membership:**  
Postgraduate, Postdoctoral colleagues and Research Assistants, whose supervisors are full HRI members.
- **Affiliate membership:**  
Health Researchers who are members of UL-affiliated Health Organisations.

These categories showed an increase in membership of 16%, 55% and 32% respectively.

The increased membership numbers are aligned with the continued development of a broader base in terms of disciplines and research interests, with continued and growing representation from all four UL faculties.

The increase in our Affiliate membership is welcome and allows us to further enable critical academic-clinical partnerships. A very positive outcome too, is the substantial increase shown in the numbers of Postgraduate and Postdoctoral members who contribute significantly to the objectives and energy of the Institute. Support of this cohort is a critical element of our activity.

The expansion in our membership equips us well for strategic collaborations, knowledge sharing and enhanced opportunities for external research funding success.



# Selected Member Profiles

## Ms Amira Mahdi

Membership type: Postgraduate/Postdoctoral



**Ms Amira Mahdi**  
*PhD Researcher, Graduate Entry Medical School, University of Limerick*

My name is Amira Mahdi. I am a final year PhD student in the Graduate Entry Medical School (GEMS). Under the supervision of Dr Pat Kiely and Dr Kieran McGourty. I am researching the cellular and molecular mechanisms driving breast cancer progression. In particular, I am interested in the cellular and environmental changes that enable tumour cells to leave the primary site and travel around the body in a process called metastasis. My research relies on a strong interaction between GEMS, the HRI and the Bernal Institute.

Joining the HRI as a postgraduate member has been extremely valuable to me. The regular lunchtime meetings provide a unique opportunity to meet and network with other members and researchers of all career levels and across all disciplines. These meetings provide a relaxed and unimimidating setting to develop interdisciplinary collaborations or to simply chat about research topics and gain insight from colleagues about the research landscape in general.

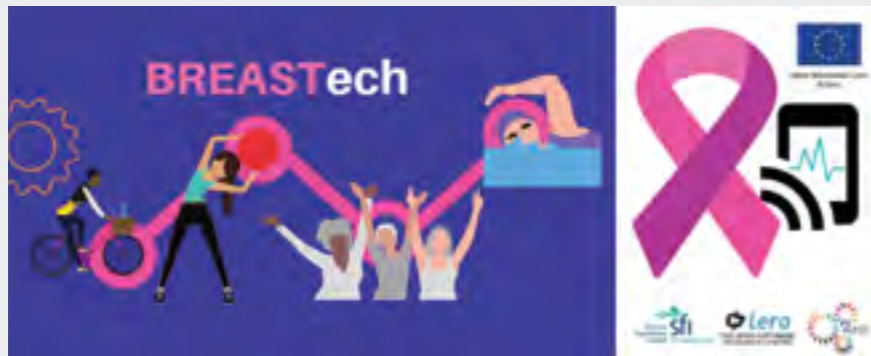
I have attended a number of HRI hosted talks by visiting speakers whose research interests align closely with my own and through the HRI, I have had several opportunities to present my research to a wide audience, such as at the HRI Research Day and the HRI-supported UL Cancer Network research day. My membership has allowed me to develop skills on topics outside of my own PhD work, including Good Clinical Practice and Public and Patient Involvement.

One of the most valuable aspects of my HRI membership has been the support given to early career researchers in finding funding opportunities. As someone starting out on an academic research career, it can be challenging to know where to begin. The HRI regularly sends details of upcoming national and international funding schemes and research events, as well as providing support and advice for applicants. This has been invaluable in allowing me to plan my next career stage. Overall, my time as a postgraduate student has been positively impacted by my HRI membership and I am grateful for the many ways the HRI has facilitated the advancement of my early career research goals.

## Dr Michelle Norris

Membership type: Postgraduate/Postdoctoral

Currently, I am a Marie Skłodowska-Curie COFUND Research Fellow (ALECS Programme) in Lero – The Irish Software Research Centre, within the Faculty of Science and Engineering. Having completed a PhD in Sport and Exercise Science (2017), University of Limerick, and having spent three years working in the Research Group in Breast Health, University of Portsmouth, I have merged my backgrounds and am undertaking a project titled “BREASTech: Increasing physical activity in breast cancer patients through technology enabled care”. My work entails investigating barriers to physical activity which breast cancer patients and survivors have, and developing novel technology-based solutions to address these barriers. I am also more widely interested in the support tools which breast cancer survivors utilise post breast cancer treatment, and the role which technology plays as a support tool.



Since joining the HRI in 2019, it has become clear that being a part of such an Institute provides Research Fellows with the necessary support, encouragement and guidance required, to become an independent researcher. To date the HRI has provided me with the opportunity to build collaborative links and engage with a network of researchers across multiple research fields, leading to numerous collaborative funding applications over the last twelve months. Additionally, the HRI has also provided knowledge, clarity and guidance around funding application development and submission, ensuring that all submissions are feasible and realistic. While relatively new within the HRI, I take every opportunity to engage with the Institute, and look forward to future endeavours and collaborations, which occur as a result of my membership.



**Dr Michelle Norris**  
*Research Fellow, Science and Engineering, University of Limerick*

## Dr Denis O’Keeffe

Membership type: Affiliate

I am currently a Consultant Haematologist in University Hospital Limerick. My primary research area of interest is thrombosis. I am currently Co-Chair of Thrombosis Ireland and Lead Principal Investigator for the TiLLIRI study- a Prospective multicentre study to assess the risk factors that contribute to (T) thrombosis in patients with (L) lower (L) limb (I) injuries (R) requiring (I) immobilization- to identify a group of patients with a high predicted VTE risk, (TiLLIRI study). This study is now running in 13 hospitals across Ireland and is the largest study of its kind ever undertaken. A key part of the success of this study has been recruitment in Limerick. This has been achieved with the support of the HRI and in particular Siobhan Egan, Clinical Nurse Manager. There are now 700 patients enrolled in this study with 370 patients enrolled in Limerick.



**Dr Denis O’Keeffe**  
*Consultant Haematologist, University Hospital Limerick*



Our second important study is the HighLow study, which assesses two different doses of low molecular weight heparin for prophylaxis in pregnant women who have had a previous thrombosis. This is an international study taking place in multiple countries across the world. University Hospital Limerick, along with the Mater hospital in Dublin are the main recruitment centres in Ireland. Once again the support of the HRI has been key to getting this trial going in Limerick with both advice and research nurse support.

## Dr Brian Carson

Membership type: Full

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Metabolic function is important for human performance and health and is implicated in a number of chronic illnesses including Type 2 Diabetes, Cardiovascular disease and Cancer among others. I am interested in how our metabolism is regulated by physical activity, exercise and nutrition. Specifically, my research focuses on adaptations in metabolic function in response to physical activity, exercise and nutrition with a particular focus on muscle metabolism. Muscle is important as it is the largest organ in the body and responsible for our movement, enabling us to play sports, but more importantly to carry out our activities of daily living and to age successfully. Muscle is also capable of acting as a final destination for nutrients such as glucose and lipids to be metabolized which, if circulating in too high concentrations, can have negative implications for our health.

The HRI has helped facilitate my research in this area by putting in place a number of support structures for the undertaking of human research at each stage of the research process. The HRI has supported a new cluster of researchers in Physical Activity for Health (PAfH) to foster collaborative research in this space. The HRI has helped facilitate introductions to clinical researchers at UHL which have forged new collaborations which will enable impactful future research on clinical populations.

The Research Funding Officer has helped me to craft and refine funding proposals to ensure clarity of purpose and maximise impact. The HRI Clinical Research Support Unit (CRSU) has supported me with clinical trials registration and reporting and provided access to clinicians to assist in the delivery of research projects. Each of these structures was important in securing industry partner funding and the delivery of a recent project investigating the impact of the pre-exercise nutrient state on the adaptation of muscle metabolism to sprint interval training. The findings of this study have already been leveraged to secure further funding and will form the basis of future proposals in clinical populations.



**Dr Brian Carson**  
*Exercise Physiologist in the Department of Physical Education and Sport Sciences, University of Limerick*

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## Dr Elizabeth Ryan

Membership type: Full

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I took up a lectureship position in University of Limerick, Dept. of Biological Sciences in September 2018. I coordinate the BSc in Bioscience and teach Immunology and Host-Microbes interactions. My research expertise is in translational/human immunology particularly focusing on cancer and autoimmune disease, studying patient cohorts to discover potential prognostic or predictive biomarkers. One such marker, a protein called KHSRP regulates translation of inflammatory cytokines in the tissue microenvironment and may play a role in dictating the inflammatory environment of colorectal cancer.

The inflammatory environment of cancers can impact on the function of tumour infiltrating immune cells and this is important to determine a patient's prognosis and predict response to chemotherapy or immunotherapy. I am particularly interested in how myeloid cells e.g. macrophages and dendritic cells behave in tissue microenvironments.

I am developing model systems to investigate how female sex hormones influence the function of these cells, and also collaborative studies to investigate the impact novel biomaterials have on these cells.

I am a member of the HRI-funded UL Cancer research Network (ULCaN). Events such as the HRI Research Day in December 2019 and the HRI monthly lunch meetings have helped me to establish a network of collaborators locally in UL which is of great benefit as I continue to meet my research goals. I have found the HRI support given for research applications through the HRI Research Funding Officer to be invaluable.



**Dr Elizabeth Ryan**  
*Lecturer in Immunology in the Department of Biological Sciences, University of Limerick*

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# stimulating research capacity building

## Investing in our Members HRI Funded Research Clusters update 2019

### Developing Research Capacity

In 2018, the HRI embarked on an ambitious initiative to stimulate research capacity building by investing in research clusters bringing together researchers from across disciplines with common areas of research interest.

This resulted in significant investment, both monetary and operational, in 6 Clusters- 4 large and 2 emerging. The aim of this initiative is to develop focused areas of research with an emphasis on global and societal challenges. The outputs expected include development of research networks, building capacity, increased competitiveness in external grant applications and growth in research-related KPIs.

The clusters became operational in 2019 and an update on each now follows.

# PHYSICAL ACTIVITY

## Physical Activity for Health (PAfH)

Principal investigator: **Prof. Alan Donnelly**

→ <https://www.ul.ie/hri/physical-activity-health-pafh>

### Summary

The Physical Activity for Health Cluster (PAfH) aims to build a national and international hub of excellence in the area of Physical Activity (PA) and health research by bringing together a multidisciplinary group of physiologists, sports and exercise scientists, physiotherapists, and health, sports and exercise psychologists.

The cluster is led by Prof. Alan Donnelly, Associate Professor in exercise physiology, alongside nine colleagues across departments/disciplines in UL. These include; Dr Roisin Cahalan, Dr Brian Carson, Prof. Susan Coote, Dr James Green, Dr Matthew P. Herring, Dr Ciaran MacDonncha, Dr Tadhg MacIntyre, Dr Elaine Murtagh and Prof. Catherine Woods.

### Progress During 2019

The PAfH cluster has proven excellence in 1) research impact, 2) collaboration and networking and 3) capacity building and training. In its first nine months, the PAfH cluster has had 6 successful funding applications, with awards totaling €409,850, including awards from the Irish Research Council (IRC) and Healthy Ireland. In 2019, PAfH published 43 peer-reviewed publications, of which more than 70% are in quartile one journals, and has presented work at numerous national and international conferences.

The number of researchers affiliated to PAfH increased to 30 in 2019. Collaboration and networking objectives have also been achieved including, the official launch of PAfH in April 2019 in UL. This launch featured international speaker, Prof. Nanette Mutrie with a talk entitled **"Walking the talk - is walking the best buy for public health?"** This launch was well attended. In addition, Dr Herring finalised the establishment of **'Exercise is Medicine (EIM) Ireland National Centre'** and a 'Memorandum of Understanding' was approved and signed by UL and the American College of Sports Medicine.

Collaboration was also strengthened by the creation of a 'Memorandum of Understanding' between Edinburgh University's Physical Activity for Health Research Centre (PAHRC) and PAfH. PAfH has also emphasised capacity building and training events, which have proven popular within the national and international PA community.



Launch of the PAfH training events, April 2019 led by PAfH member Dr Roisin Cahalan, Lecturer in Physiotherapy, School of Allied Health, University of Limerick

### The Future

PAfH will continue to develop as a national and international hub of PA research excellence, and this success will attract further networking and collaboration opportunities. To ensure financial sustainability, PAfH will continue to lead and participate in large competitive bids at a national and European level. Short-term goals include the development of a PAfH data-repository and bio-bank, both of which will strengthen future research potential. In addition, we foresee our membership numbers climbing and the frequency of training events increasing over time. We hope to extend the profile of PAfH and the HRI, and become a world leader in this field.

# AGEING

## Ageing Research Centre (ARC)

Principal investigator: **Dr Katie Robinson**

→ <https://www.ul.ie/hri/ageing-research-centre-arc>

### Summary

The Ageing Research Centre comprises an interdisciplinary group of researchers with a shared research interest in ageing who aim to:

- Conduct internationally significant, excellent research that leads to improvement in the health, well-being and social inclusion of older people.
- Work across disciplinary boundaries in partnership with older people to address research priorities that reflect the day to day realities of older people's lives.
- Develop capacity in ageing research at UL and build collaborations with researchers, clinicians, industry partners, older people and their representative organisations.

### Progress During 2019

The Ageing Research Centre had a very productive year in 2019. Highlights include:

- We have established robust Centre governance with excellent participation from members across our various committees.
- Fortnightly ARC meetings provide a welcoming and informal space for Centre members to share information, plan Centre activities and develop a vision for future work.
- The Centre is working hard to offer support at every stage of career development to our members. During 2019, we held events on campus in UL and in CERC (Clinical Education and Research Centre) UHL which focused on PhD students and we are embedding a culture of mentorship and collaboration within the Centre to support early career researchers.
- We have methodological expertise in evidence synthesis in the Centre and we continued to build on our strong track record of systematic review and review of methodology publications in 2019. We were delighted to host a very well attended and positively evaluated Evidence Synthesis Summer School over two days in CERC, UHL in June, in collaboration with colleagues from Evidence Synthesis Ireland (Prof. Declan Devane & Dr Linda Biesty). The summer school was enriched by the interdisciplinary attendees from clinical practice and academic settings.
- A major achievement in 2019 was the establishment of an older adult and family carer stakeholder panel. The Ageing Research Centre is committed to working together in partnership with older people and the stakeholder panel provides a mechanism to realise this ambition. The Centre has benefited hugely from the support of our colleagues on the PPI Ignite @UL team who have worked across the clusters to embed a culture where stakeholders influence research.
- In 2019, we continued to research and disseminate findings at multiple fora across our three key thematic areas of focus; Aligning health services to the needs of older people, Ageing in place, and using health analytics to optimise outcomes for older people.



L-R: Dr Sara Hayes, Lecturer in Physiotherapy, UL; Dr Rose Galvin, Senior Lecturer in Physiotherapy, UL; Dr Pauline Meskell, Senior Lecturer in the Department of Nursing & Midwifery, UL and Dr Siobhan Leahy, Dean's Postdoctoral Research Fellow, School of Allied Health, UL pictured with Prof. Declan Devane from National University of Ireland Galway at the ARC Evidence Synthesis Summer School 2019

- Research in the Centre was recognised in 2019 with Susan Williams, supervised by Dr Rose Galvin, winning a Global Undergraduate Award in the Nursing Midwifery and Allied Health category for her research on falls interventions for community dwelling older adults.
- The Ageing Research Centre was very well represented at the Irish Gerontological Society annual scientific meeting with multiple presentations and the prize for best oral presentation awarded to Ide O'Shaughnessy, Senior Occupational Therapist at University Hospital Limerick for her presentation of the OPTIMEND trial.

### The Future

The Ageing Research Centre welcomes new members- academic, student, clinical or experts by experience. If you are interested in joining, please reach out to us via email [justyna.lis@ul.ie](mailto:justyna.lis@ul.ie)

We have big plans for 2020. To find out about upcoming events or activities in the centre please follow us on Twitter @ARC\_UL



# IMPLEMENTATION SCIENCE

## Health Implementation Science and Technology (HIST)

Principal investigator: **Prof. Alice Coffey**

→ <https://www.ul.ie/hri/health-implementation-science-and-technology-hist>

### Summary

The Health Implementation Science and Technology Cluster (HIST) was established and funded by the HRI, to promote and build capacity in the Science of Implementation with Information and Communication Technology (ICT) across the University of Limerick and beyond.



The HIST management team is representative of many departments across the University and is composed of:

**Prof. Alice Coffey (PI)** *Department of Nursing and Midwifery; Faculty of Education and Health Sciences*

**Prof. Stephen Gallagher** *Department of Psychology; Faculty of Education and Health Sciences*

**Dr Audrey Tierney, Dr Carol-Anne Murphy, Dr Arlene McCurtain**, *School of Allied Health; Faculty of Education and Health Sciences*

**Prof. Sean Redmond** *School of Law; Faculty of Arts Humanities and Social Science*

**Dr Pepijn van de Ven** *Department of Electronic & Computer Engineering; Faculty of Science and Engineering*

Our aim over a three-year period is to strengthen knowledge in the field of Implementation Science (IS) with ICT and to develop shared principles and a common approach, to guide our implementation collaborations and research into the future. To oversee the work of the cluster we have an established governance structure and External Advisory Committee.

### Progress During 2019

The overarching goals and objectives of HIST are in Research; Training and Capacity Building; Collaboration and Net working. In its first year the HIST cluster has made excellent progress in relation to all three areas.

### Research

**Demonstrator Projects:** HIST established and progressed two demonstrator projects with embedded IS and ICT:

→ **Project 1: MEDRA**

Investigating the Effects of a Mediterranean Diet in Rheumatoid Arthritis using RE-AIM framework (PI: Dr Audrey Tierney)

→ **Project 2: National Speech & Language Therapy Project in Schools**

Investigating the implementation process and impacts of evidence-based classroom interventions for students with speech, language and communication needs using a Knowledge to Action Framework (PI: Dr Carol-Anne Murphy)

To support early career researchers and build a talent pathway in Implementation Science the cluster established and progressed a small grants award scheme to support four project proposals incorporating Implementation Science methodology. The application process and independent review panel were established in 2019, with the selection process scheduled for 2020.

The HIST cluster submitted a number of research-funding applications in 2019 with outcomes expected in 2020:

1. Action Research Project implementation study funded by the Department of Justice and Equality (PI: Prof. Sean Redmond).
2. HRCI/HRB funding call in relation to dietary quality in Cystic Fibrosis. (PI: Dr Audrey Tierney)
3. HRB CDA award (Co-App: Prof. A. Coffey)

### Training and Capacity Building

HIST hosted a number of seminars and masterclasses during 2019.

- Our launch seminar event: **Introduction to Implementation Science** was held on 23rd May 2019 and was facilitated by Dr Sheena McHugh ESPRIT UCC and Dr Catherine Darker TCD
- A one-day membership collaborator workshop: **Sharing current and future research plans – establishing networks** was hosted on June 20th 2019
- Prof. Nick Sevdalis of Kings College London Implementation Science Centre facilitated a *Masterclass in Implementation Science* on 7th November 2019

### Collaboration and Networking

The HIST cluster has established links and collaborated with Implementation Science researchers in Ireland and abroad. We have linked with national implementation scientists such as the ESPRIT group UCC, Dr Catherine Darker TCD, and the Centre for Effectiveness Services (CES), Dublin. We are collaborating with Prof. Carl May, an International Implementation Scientist and developer of the Normalization Process Theory and Prof. Tracy Finch, Professor of Healthcare & Implementation Science in Northumbria University on a planned seminar event for October 2020 and also in research funding applications.

# IMPLEMENTATION SCIENCE

## Health Implementation Science and Technology (HIST) (continued)

Prof. Coffey attended a Masterclass and IS Conference in Kings College Implementation Science Centre London in July 2019, which led to the facilitation of a masterclass by Kings College at UL in Nov 2019.

The HIST cluster presented at the PPI Community Engagement Fair at UHL in 2019 and subsequently has collaborated with PPI-Ignite in a co-hosting event planned for 2020.

We have established links with Prof. Heleen Riper and Dr Christiaan Vis from the VU University, Amsterdam, Netherlands and collaborated with them to host a seminar on the EU H2020- funded *ImpleMentAll* project in January 2020 and on future grant applications. We have established a connection with Professor Geoff Curran, an Implementation Science frameworks expert and Director of the Centre for Implementation Research at UAMS Arkansas USA.

We have a membership of fifty researchers from within and outside of UL in 2019 and interest is growing. Our online membership application system assists us in maintaining a database of members that enables ease of communication about training and events.



HIST Collaborator Workshop event June 2019



L-R: Prof. Nick Sevdalis, Professor of Implementation Science and Patient Safety, Director of the Centre for Implementation Science, Kings College, London; Prof. Alice Coffey, Professor of Nursing and lead of the HIST research cluster, UL; Dr Aoife Keohane, Researcher- Centre for Implementation Science at Kings College, London; Dr Julie Williams, Researcher- Centre for Implementation Science at Kings College, London

### The Future

The HIST cluster will build on the networks and collaborations established in year 1 to progress our goals in research, capacity building and networking. We have set out specific goals for year two: to secure National and European research funding, and to work with our collaborators in progressing goals in training and capacity building. By the end of year two, we will have broadened our engagement with researchers across all faculties in the University of Limerick, strengthened our collaborations with National and International IS and ICT experts through research funding applications and capacity building events and developed and promoted a common understanding of Implementation Science with ICT.

The HIST Cluster welcomes new members. If you are interested in joining, please contact us via email [justyna.lis@ul.ie](mailto:justyna.lis@ul.ie)

To find out about upcoming events or activities in the cluster please follow us on [Twitter @HIST\\_UL](https://twitter.com/HIST_UL)

# DESIGN & THE ARTS

## Product Design and the Performing Arts (PD + PA)

Principal investigator: **Dr Louise Kiernan**

→ <https://www.ul.ie/hri/product-design-and-performing-arts-pdpa>

### Summary

This cross-disciplinary Research Cluster provides the collective thinking of Design, Technology, Allied Health, Physical Science and Business to deliver market-driven and user-centered product/service innovations for the performance arts. The cluster aims to develop and commercialize products in this area.

### Progress During 2019

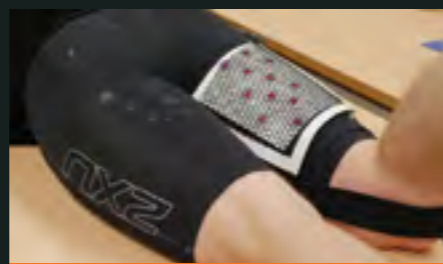
#### Project 1: The Hard Irish Dancing Shoe, is it fit for purpose?

The aim of this project is to develop a foot solution to mitigate against the injuries in Irish dancing. Studies completed include observations, interviews and surveys to understand the needs of dancers. Video analysis of 28 dance steps were captured to determine the biomechanical movement of the foot. A Biomechanics pilot study examined the extent of the underfoot forces and lower extremity movement kinematics.



#### Project 2: Research and development of a device for the treatment of muscle injury through the measurement of tissue sensitivity and pain perception

This entailed the development and testing of a soft padded garment to accurately house pressure sensors. The focus was to ensure accurate and repeatable placement of the sensors.



#### Project 3: Device to support the health and performance of the vocal tracts of singers and those receiving voice therapy

Following research with singers and singing teachers a device to support singers applying the SOVT technique was developed. The project will be developed to include speech and language therapy needs.



### The Future

We plan to grow our portfolio of projects and cluster network. We are also seeking additional funding streams and will apply to relevant calls to commercialise solutions.

# MIGRANTS IN HEALTH RESEARCH

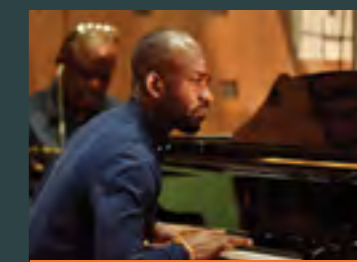
## PART-IM – Participatory and Arts-Based Methods for Involving Migrants in Health Research

Principal investigator: **Prof. Helen Phelan**

→ <https://www.ul.ie/hri/participatory-and-arts-based-methods-involving-migrants-health-research-part-im>

### Summary

The PART-IM research cluster brings together researchers from Medicine, Nursing & Midwifery, the Performing Arts, as well as a leading NGO for migrants. Our vision is to develop increased understanding of the role of participatory, arts-based methods for involving migrants in health research.



### Progress During 2019

The PART-IM cluster commenced its work on **1 September 2019**. Its focus during 2019 was on operational tasks related to each of its three work-packages in research, collaboration and networking, and capacity building and training.

A key operational task involved the **recruitment of a postdoctoral researcher** in participatory and arts-based migrant health research. The recruitment process commenced in October, 2019 and an appointment is due in 2020. A core component of this position involves leading a scoping review on the use of music as an arts-based method in migrant health research. The protocol for this review has now been published (<https://hrbopenresearch.org/articles/3-75>) in HRB Open Research.

Our collaborative and networking preparations during 2019 included the development of a Symposium on **Arts-Based Approaches to Health Research** scheduled for 2020. This will include a keynote address by Professor Patricia Leavy, an internationally recognized leader in arts-based research design, as well as a series of workshops by organisations such as *Musicians Without Borders*; *Sing Up! UK*; *The American Institute of Music and Healing*, and Irish conductor, David Brophy. 2019 also saw the initial planning for a bespoke *training programme in singing as a participatory method in migrant health research* with our training partners, **Musicians without Borders**.

### The Future

The work of 2019 has resulted in strong operational foundations which support the delivery of an ambitious programme, as well as capacity growth through strategic, sustainable development.

# HRI Seed-Funding Call Update 2019

In 2018, the HRI identified that investment in the early development of multi-disciplinary research projects could essentially strengthen these projects to render them capable of applying competitively for external funding and so decided to seed fund a number of such projects. This investment would also give emerging researchers the opportunity to gain experience in grant applications and project management.

These projects progressed during 2019 with some now completed, and an update on each now follows.

## Development of a Process to study Concussion Recovery using Blood-based Biomarkers

Principal investigator: Dr John Mulvihill

### Project Description:

Sports related concussion (SRC) remains the most frequent match related time loss injury in professional rugby. Recent concussion consensus statements recommend screening for SRC by a multi-modal set of tests. In professional rugby diagnosis of SRC, a three-stage Head Injury Assessment (HIA) is implemented, which is a modified form of the fifth edition of the Sports Concussion Assessment Tool (SCAT 5).

Recent Assessment of the HIA in match settings has shown a moderate level of sensitivity at 76.8%. This suggests that additional diagnostic modalities would be beneficial for accurate diagnosis of SRC, but as of yet no assessment can indicate when a player can return to play. Therefore, a minimum of six days of recovery is required for a professional player before they can return to play.

To date there are no studies that assess the ability of blood biomarkers to indicate recovery from concussive episodes that may help determine a player-specific time frame to safely return to play. Our study aims to address this by investigating the effectiveness of current biomarkers to assess their specificity and their capability to measure or indicate recovery. Further, we aim to identify novel biomarkers for concussion that could potentially overcome some of the specificity and prognostic shortcomings of current biomarkers.

### Project Objectives:

1. Measure the levels of blood biomarkers in rugby players that have experienced an SRC, confirmed via HIA, to assess the utility of the biomarkers for concussion diagnosis.
2. Track the levels of the blood biomarkers over time, post-injury to determine if levels correlate with clinical recovery.
3. Analyse the global protein levels in blood in rugby players that have experienced SRC through mass spectrometry in a hypothesis-free driven approach to new biomarker discovery.

### Progress to Date:

Currently, we are in the second year of the study and we have fully developed the process to collect, store and assess the blood samples. We have assessed the biomarkers for the first season that have confirmed the effectiveness of the study design. We have submitted the study design to the British Medical Journal Sports and Exercise Medicine, which is under review. We are now in preparation for the third year of sample collection in conjunction with Munster and the HRI Clinical Research Support Unit.

### Future Work:

Next step is to use untargeted assessment methods to identify novel biomarkers capable of indicating recovery from concussion. In addition, we continue to seek funding in conjunction with IRFU to expand this project to another season and to other teams.





## The Development of a Psychological Intervention for Patients with Acute Skin Failure Conditions

Principal investigator: Dr Pauline O'Reilly

### Project Description:

Stevens-Johnson syndrome (SJS) and Toxic Epidermal Necrolysis (TEN) are devastating conditions resulting from a severe immune-mediated mucocutaneous reaction, which normally occurs as a result of medications. In the acute phase, the patient presents with a febrile illness, followed by skin and mucous membrane necrosis and detachment. Within a short space of time, the patient can become critically ill and is treated as a medical emergency.

The incidence rates of these conditions may be as high as 6.5 cases per million population per year. At the onset, due to the severity of the condition, the focus of care is on ensuring patient survival. There may be long-lasting psychological effects on patients. However, there is a dearth of research on the psychological impact of these conditions on patients' lives. In addition, little is known about the psychological care needs of patients who experience SJS/TEN. This research project, therefore, aims to explore, co-design and co-develop a workable psychological intervention for these patients.

### Progress to Date:

To explore the psychological impact of SJS and TEN on patients' lives, an integrative review was completed and accepted for publication in the British Journal of Dermatology <https://doi.org/10.1111/bjd.18746>. The findings highlighted that patients experienced undue stress and fear. Some patients had symptoms aligned to Post-Traumatic Stress Disorder (PTSD), anxiety and depression. In addition, Health Care Practitioners (HCPs) lacked information around the condition.

A second integrative review is currently underway on the psychological care of patients with SJS/TEN and severe burns. Because we anticipated very few, if any, papers on the psychological care of patients with SJS/TEN, it was decided to include evidence related to burns patients as they are a similar cohort to SJS/TEN patients. The protocol for this review has been submitted to PROSPERO for publication. No evidence was found relating to the psychological care of patients with SJS/TEN and so content analysis has focused on the papers related to the care of patients with burns. Analysis and write up are underway and the expectation is that a paper will be written for publication in the journal 'Burns'.

To establish key stakeholders' experiences of SJS/TEN, a qualitative descriptive study was conducted using emotional touchpoint interviews with twelve participants (patients, family members and healthcare practitioners with experience of caring for patients with SJS/TEN). The findings have been written up and the paper is currently being prepared for submission to a relevant journal.

Sheila Ryan, Advanced Nurse Practitioner (Dermatology) will present preliminary findings, from the qualitative study, at the Psychodermatology UK Annual Meeting on January 23rd, 2020 at St.Thomas's Hospital, London as well as the 6th Annual Nursing and Midwifery Research and Innovation Conference at UHL on February 18th 2020.



Plans for holding an experience-based co-design workshop with stakeholders involved in SJS/TEN are in progress. The aim of this workshop is to co-design a psychological intervention for patients with SJS/TEN.

### Future Work:

We plan to continue our research on the development of a psychological intervention for patients with SJS/TEN and are currently seeking alternative funding sources. We will be waiting for the HRB Investigator-led project funding to recommence in 2021. However, in the meantime, we will explore other possible sources of funding. We plan to build on the links that we have made with experts in King's College London and to collaborate with a group of researchers in France at the French National Reference Centre for Toxic Bullous Dermatoses, which is the national centre of excellence for dealing with SJS/TEN.

## Optimising Physical Activity and Health in Adults with Cystic Fibrosis

Principal investigator: Dr Roisin Cahalan

### Project Description:

Cystic fibrosis (CF) is one of the most common, life-limiting autosomal recessively inherited diseases in Ireland. Physical activity (PA) is regarded as an important component in the management of CF, However, a Cochrane review found that there was a lack of evidence regarding strategies to promote PA in this population and consideration should be given towards telemedicine applications and health coaching. The use of Fitbits, combined with personalised text message feedback to increase PA levels is a novel concept in CF.

### Progress to Date:

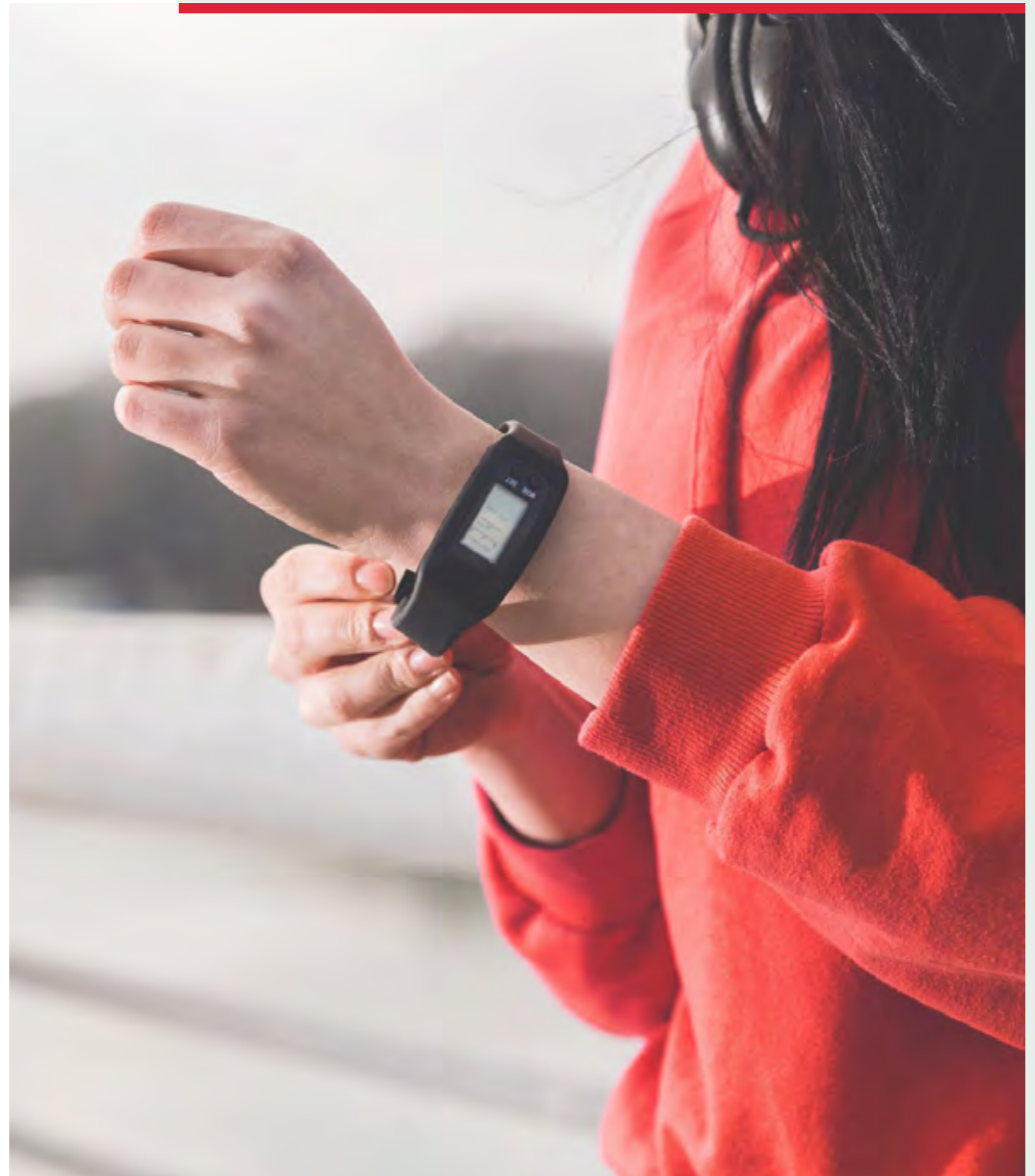
PhD student Máire Curran, along with the team in University Hospital Limerick (UHL) has been extremely proactive in leading this project. An initial study to this project assessed the validity and reliability of the Fitbit and ActivPAL tools to measure step count in people with CF. This was presented at the European Cystic Fibrosis Conference in Liverpool in June 2019 and at the Health Research Institute Threesis "Thesis in three" in November 2019. This research paper has been submitted for publication and is currently under review.

Subsequently, a randomised pilot study was conducted throughout 2019. This pilot study consisted of a twelve-week intervention and a twelve-week follow up. The intervention group received fitness tracking (Fitbit) which was linked to an online monitoring platform (Fitabase) with weekly personalised text messaging feedback based on participants' progress. The comparator group received the Fitbit alone. A range of outcomes was assessed with both quantitative and qualitative data analysis, including step count, aerobic capacity, quality of life, sleep quality, wellbeing, lung function and semi-structured interviews following the intervention to establish participant satisfaction. 32 people with CF in UHL were recruited, resulting in 16 participants per group. Data is currently being analysed and it is anticipated that this will be published in the coming year.

The protocol for this pilot study has been published in HRB Open Research <https://hrbopenresearch.org/articles/3-21/v1>. This research was selected for an elevated poster presentation at the National Cystic Fibrosis Conference and achieved second prize.

### Future Work:

Over the next year, the results of the pilot study will be analysed and written up for publication. It is anticipated that this research will be presented at national and international conferences for dissemination of findings. It is hoped that the results of this research will shape and contribute to further research in the field of CF.



## Social dance for Older Adults following Discharge from Hospital

Principal investigator: Dr Amanda Clifford

### Project Description:

A period of hospitalisation can have negative consequences on physical function and autonomy for older adults. Research has shown that following discharge from hospital, older adults are at a high risk of functional decline, dependency and reduced health-related quality of life. Older adults favour activity that focuses on social connectedness, fun and achievable skills with appropriate benefits. Research among older Irish hospital patients indicates that dance is one of the most popular leisure activities in the year prior to hospitalisation. The primary aim of this feasibility cross over, randomised controlled trial (RCT) was to determine the feasibility of the study design and acceptability of the two arts based interventions (a modified dance programme compared to music therapy intervention) designed for older adults recently discharged from hospital.

### Progress to Date:

This research aimed to explore if community and arts based health interventions designed to improve health and wellbeing, were feasible and acceptable. Participants: We recruited eligible community-dwelling older adults,  $\geq 65$  years, subjectively reporting reduced mobility at last hospital admission and  $\leq$  six weeks post discharge from an inpatient or rehabilitation setting, as the highest risk for hospital re-admission is in the first three months after hospital discharge.

**Methods:** In order to design a safe and acceptable dance and singing programme, the intervention and its mode of delivery was designed by identifying existing evidence, and consultation with dance teachers and healthcare professionals. Our systematic review investigating the effectiveness of community-based interventions for older people post hospitalisation informed the study and intervention development. Consultations were held with stakeholders to identify the most appropriate dances, dance modifications and safety issues for the dance programme. This pilot study examined the feasibility of the study design, procedures and intervention. We also examined the experiences of participants completing the dance and music interventions and the perspectives of stakeholders involved in this study and potential future studies in this area, using interviews.

**Discussion:** The findings from this study provide several imperative learning points that guide future research. The dance programme in this study was acceptable and safe for participants and longer duration programmes should be designed using the evidence-based recommendations provided. Difficulties in recruitment and attrition were explained by the barriers encountered when recruiting an incident cohort of participants of vulnerable individuals post hospitalisation. Randomisation was completed per protocol and no implementation issues were identified for future studies. This study also identified that the outcome measures used were acceptable and feasible for this group of patients and did not lead to fatigue or excessive assessment time. Participants were positive about their experience of the programme. Thus, this project provides a pre-cursor and important learnings that will inform future research in the area.

**Publications:** The team completed and submitted a Systematic Review and Meta Analysis (pending outcome): 'Older adults exercising after a hospital stay: How much? What type? Is it beneficial?' to (1) appraise and synthesise existing evidence that examined the effect of an exercise programme for older adults discharged home from hospital and (2) collate evidence on the optimum dose, type and method of delivery of exercise for this population. The team is currently finalising a peer reviewed research article based on the feasibility study and exit interviews and plan to submit for publication to *BMC Pilot and Feasibility Studies* in 2020. Members of the team are also currently completing a journal article for submission that focuses on designing a singing intervention for older people in a community setting. Authors: Sophie Lee, Des O'Neill, Amanda Clifford, Orfhlaith Ni Bhriain, and Hilary Moss.

**Presentations:** Members of the team disseminated the work at a number of events including two presentations at the AUDGPI Association of University Departments of General Practice in Ireland, ICGP 2019 Joint Scientific Meeting, and RCSI Promoting Excellence in Research and Teaching in *Irish Primary Care*. The two presentation titles were "Social Dance for Health and Wellbeing in later life"; and "Is exercise beneficial for older adults after hospital discharge"? Dr Amanda Clifford, School of Allied Health (SAH) and HRI and Nevin Kasantz, SAH.

In March Dr Orfhlaith Ni Bhriain, (Irish World Academy of Music and Dance (IWAMD) and HRI was invited to present "Social dance for health and wellbeing in Later Life" at Lamont Library, Harvard University.

The team presented *Dance for Health* as an in-service to Physiotherapy Departments in Limerick, Tipperary, Cork and Galway- Dr Orfhlaith Ni. Bhriain, Irish World Academy of Music and Dance, HRI; Dr Joanne Shanahan, School of Allied health; Nevin Kasantz, School of Allied Health and Dr Amanda Clifford, School of Allied Health and HRI.

### Future Work:

By undertaking this research, the team has connected with and developed a critical mass of relevant stakeholders including researchers, methodologists, community groups and clinicians in the area of arts for health. Learning gained from this study has helped as a precursor study to inform aspects of a feasibility study proposed in an application to the HRB Definitive Interventions and Feasibility Awards (DIFA) scheme. The proposed project **MinDful: MusIc aNd Dance For Older adULTs** aims to explore the Feasibility of an Arts Based Health Intervention for Health and Wellbeing.

# Spatial Characterisation of a Patient Derived Colonic Tumour and Atherosclerotic Plaque using a Grid Referenced Tissue Preparation Technology and Targeted Transcriptomics

Principal investigator: Dr Kieran McGourty

## Project Description:

There are various cell types within both diseased and healthy tissue; a variety of healthy cells and, in the case of cancer, heterogeneous populations of transformed cells. These cells are related and interdependent in their activity. In healthy tissue, this is precisely controlled to give rise to the specific architecture of the tissue.

In diseased tissue, these organisational cues have broken down, though they still display the characteristic structure of the cells that comprise the tissue. In both cases, the immediate surroundings of the cells are believed to control the behaviour and how they fit within the overall structure of the tissue.

Classic techniques like histology can investigate cells while they are still within the tissue, so we can understand the context of the microenvironment around them. Unfortunately, these techniques are limited in the number of genes/proteins that can be investigated simultaneously (usually four to five targets from a possibility of over 20k+). Other high coverage techniques can be employed to investigate all 20k+ targets simultaneously, like next generation-sequencing, and thus have a much greater readout/understanding of cell activity. Importantly though, these techniques rely on disrupting the tissue structure. All the information relating to where the cells came from in the tissue are lost, and therefore the understanding of how each cell relates to its neighbour or environment is lost. These orders of interaction are extremely important when looking at healthy tissue, but even more so when looking at diseased tissue, like metastasising (spreading) cells in a tumour.

Understandably, there is a strong need to develop technologies that avail of the greater analytical understanding from the high coverage techniques already in existence in the market and to be able to couple that with the spatial information available through classic histology. Our approach, where we are developing a tissue pixilation grid preparation platform, allows each grid pixel to be investigated using high coverage techniques. These pixels are also overlaid on histological sections so that the higher coverage information from each pixel also has the spatial information previously absent. As a result, we can see everything that is going on in the cells, but also where they are and what their microenvironment is in the diseased or healthy tissue. This is an extremely important advance in our understanding and is vital information to be able to classify cell behaviour and understand disease.

## Project Objectives:

1. The primary objective of this research work is to develop a tissue preparation platform technology that will allow the research team to investigate different parameters (RNA/biomechanical/biochemical) of diseased tissue while maintaining spatially resolved characterisation.
2. The next objective will be to use the 2D H&E and immunofluorescent labelled and biomechanically mapped images of adjacent sections of the tumour or plaque (Figure 1, example) to generate a histological atlas of key cells and extracellular components of the tissue.
3. The secondary objective of the research project will be to establish a 2D, spatially resolved mRNA expression profile of known expression markers for patient-derived (1) colonic-tumour (2) atherosclerotic-plaques.

4. Creation of spatially resolved transcriptomic data-set profile of a targeted panel of genes across a section of a colonic tumour and atherosclerotic-plaques. This will ultimately result in the final objective which is to overlay the 3D transcriptomic, immuno-fluorescence and image profiles on a 3D volumetric reconstruction of the original tumour or plaque, provided by Prof. Calvin Coffey (Consultant Colorectal Surgeon) or Mr Eamon Kavanagh (Consultant Vascular Surgeon), respectively.

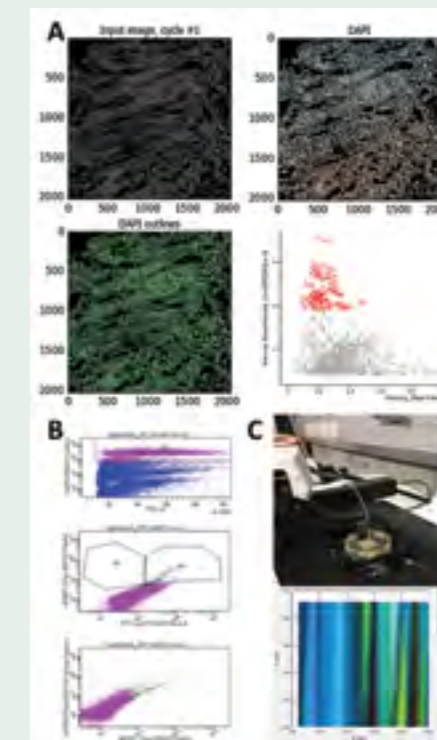
## Progress to Date:

Currently, we are in the second year of this study. Work to date developing the tissue preparation platform has resulted in a number of successful follow-on grants, including an Enterprise Ireland Innovation Partnership (640k) with BD Bioscience, 2xPhD Industry led IRC PhD positions (2x96k), a prototype development fabrication grant with Karlsruhe Institute of Technology KIT KMNF (~100k) in Germany. Importantly, the design and initial prototypes, which were granted an invention disclosure protection in preparation for patent protection, have been fabricated and delivered. Testing has now begun in earnest with the first proof of principle results expected in early Q4 2020.

In addition to heavy emphasis on the pixel device development, we have undertaken considerable optimisation and progress in the immuno-histological/biomechanical atlas generation. Antibody selection, high-throughput imaging techniques, and subsequent image cytometry analysis have been optimised. The methods developed are the subject of the first publication coming from this work (in preparation), where one can generate analytical techniques to characterise cells in situ using high content analysis and machine learning classification (Figure 1 A, B). We have initiated the coupling of this data to cellular level biomechanical characterisation through nano-indentation (Figure 1 C). These multidimensional data sources will ultimately be incorporated in a 3D transcriptomics, histological and biomechanical map of target tissues based on the techniques we have already developed or which are currently under testing.

## Future Work:

We are currently in an extremely strong position relating to this research area, with fundamental methodologies and design strategies either already developed or undergoing evaluation. The next major milestones in Q4 2020 and Q1 2021 are to evaluate the pixel platform in the context of RNA transcription of porcine tissue, before generating transcriptomic analysis in patient colonic tumours and atherosclerotic plaques. The project strategy dovetails with the expanded scope of the pixel platform into single cell spatial transcriptomics, in collaboration with BD Biosciences. In addition, we aim to publish two papers of our findings from the image cytometry method development and cellular level biomechanical atlas generation in Q4 of 2020. Lastly, we will incorporate our various analytical methods into two studies to evaluate patient atherosclerotic plaques and human colonic tumours to generate a multidimensional atlas incorporating transcriptomic, histological and biomechanical data. We estimate these investigations will be published in Q1/Q2 2021.



**Figure 1** Examples of A) High-throughput histological image cytometry cell analysis using Cell-Profiler and Perseus analysis. B) Validation using flow cytometry analysis of cell from the same tissue. C) Example biomechanical longitudinal cross section of a porcine villus.

# New Funding Schemes

In 2019, the HRI launched some new funding opportunities for Members. These schemes were introduced as a result of member feedback and to provide mechanisms to improve research outputs, develop new networks and enhance researcher recognition.

## Open Access

The first Open Access call was launched in April 2019, with 3 calls in total during the year. Open Access publications generally have higher citation rates than equivalent print journals and the aim of this funding is to increase publications in high impact Open Access journals, as a route to increased impact through citations. The most important requirement of this call is that the proposed journal is top-Decile. This requirement changes to Quartile 1 for Early-Career Researchers. Each call was well-supported in 2019 across many disciplines and so we will continue this investment for the foreseeable future. One example of a 2019 HRI Open Access Funding Award is that achieved by:

**Dr. Kieran O'Sullivan, Senior Lecturer in Physiotherapy, School of Allied Health, University of Limerick:** *Cognitive Functional Therapy compared with a group-based exercise and education intervention for chronic low back pain: a multicentre randomised controlled trial (RCT)*

**Authors:** Mary O'Keeffe, Peter O'Sullivan, Helen Purtill, Norma Bargary, Kieran O'Sullivan  
**British Journal of Sports Medicine.** Impact factor 11.645

### Abstract

**Background:** One-size-fits-all interventions reduce chronic low back pain (CLBP) a small amount. An individualised intervention called cognitive functional therapy (CFT) was superior for CLBP compared with manual therapy and exercise in one randomised controlled trial (RCT). However, systematic reviews show group interventions are as effective as one-to-one interventions for musculoskeletal pain. This RCT investigated whether a physiotherapist-delivered individualised intervention (CFT) was more effective than physiotherapist-delivered group-based exercise and education for individuals with CLBP.

**Methods:** 206 adults with CLBP were randomised to either CFT (n=106) or group-based exercise and education (n=100). The length of the CFT intervention varied according to the clinical progression of participants (mean=5 treatments). The group intervention consisted of up to 6 classes (mean=4 classes) over 6-8 weeks. Primary outcomes were disability and pain intensity in the past week at 6 months and 12 months post-randomisation. Analysis was by intention-to-treat using linear mixed models.

**Results:** CFT reduced disability more than the group intervention at 6 months (mean difference, 8.65; 95% CI 3.66 to 13.64; p=0.001), and at 12 months (mean difference, 7.02; 95% CI 2.24 to 11.80; p=0.004). There were no between-group differences observed in pain intensity at 6 months (mean difference, 0.76; 95% CI -0.02 to 1.54; p=0.056) or 12 months (mean difference, 0.65; 95% CI -0.20 to 1.50; p=0.134).

**Conclusion:** CFT reduced disability, but not pain, at 6 and 12 months compared with the group-based exercise and education intervention. Future research should examine whether the greater reduction in disability achieved by CFT renders worthwhile differences for health systems and patients.

**Trial registration number** ClinicalTrials.gov registry (NCT02145728).

## Conference Travel

In 2019 we established a Conference Travel fund with the aim of supporting HRI members in presenting new research, allowing HRI members to bid for the hosting of future instances of the intended conference, or to support PhD researchers who are presenting at a Conference.

The process for each call is competitive, with success based on impact and strategic value to the researcher, the HRI and to UL.

Some examples of **2019 HRI Conference Travel Funding Awards** include:

**Dr Matthew P. Herring, Lecturer in Sport, Exercise, and Performance Psychology, Physical Education and Sport Sciences, University of Limerick:** *European Congress on Exercise is Medicine; Amsterdam, The Netherlands. 19- 21st September 2019. Homebased Pilates for Symptoms of Anxiety, Depression, Fatigue among PwMS: Eight-Week RCT Protocol.*

**Authors:** Dr. Matthew P. Herring, FACSM, Karl M. Fleming, Prof. Susan Coote

### Abstract

Evidence supports positive effects of exercise on mental health outcomes among people with Multiple Sclerosis (PwMS). However, non-traditional exercise modes like Pilates remain understudied.

This study will investigate the effects of immediate start home-based Pilates compared to delayed-start control condition on symptoms of anxiety, depression, and fatigue among PwMS.

Adults (>18 years old) with physician diagnosed Multiple Sclerosis, Patient Determined Disease Steps (PDDS) score <3, who are free from any other significant physical or psychiatric condition, with no previous Pilates experience, and who have no medical contraindications to safe participation in physical activity will be randomised to two weekly home-based Pilates sessions guided by a DVD or delayed-start control. Well-validated questionnaires will assess symptoms of anxiety, depression, and fatigue at baseline and weeks two, four, six and eight of the intervention. Standardized mean differences and Hedges' d effect sizes will be calculated to quantify the magnitude of change within groups and the magnitude of between-group differences for home-based Pilates compared to delayed-start control condition. Based on recent feasibility findings we hypothesize that, compared to delayed-start control, immediate-start home-based Pilates will result in moderate-to-large improvements across outcomes.

This randomised controlled trial will provide additional information regarding the feasibility of Pilates to improve mental health outcomes, and the magnitude of the effects of Pilates compared to a wait-list control on mental health outcomes among PwMS. These findings should inform both healthcare professionals and exercise scientists regarding the potential of home-based Pilates to improve management of several mental health symptoms prevalent among PwMS.

**Dr Arlene McCurtin**, Lecturer in Speech & Language Therapy, Course Director and Discipline Lead, School of Allied Health, University of Limerick: 9th International Conference for Evidence Based Teachers and Developers/ 8th International Conference of the International Society for Evidence Based Healthcare <https://www.ebhc.org/> Taormina, Sicily. 6-9th November 2019.

*Identifying some challenges in evidence use and synthesis in Clinical Practice Guidelines.*

**Authors:** Arlene McCurtin, Pauline Boland, Maeve Kavanagh, Dominika Lisiecka, Caoimhe Roche, Rose Galvin.

#### Abstract

Clinical guidelines are decision support tools intended to facilitate evidence-based clinical decision making. Their role in such decision making is central, both in cases where interventions are empirically supported and where there is limited evidence. This is especially important in light of findings which suggest high usage of guidelines among clinicians. Thickened liquids is an internationally, commonly used intervention for aspiration post-stroke subsequent to oropharyngeal dysphagia. Despite its widespread use, the evidence supporting the intervention is limited and conflicting.

Thus, an analysis of the recommendations made by guidelines regarding thickened liquids is warranted. The purpose of this systematic review was to evaluate the evidentiary bases of recommendations made by stroke clinical guidelines regarding the thickened liquid intervention.

A systematic search for clinical guidelines was conducted across a number of databases and guideline websites. Thirteen stroke clinical guidelines were included in the review. Methodological quality was variable but generally good-excellent. Despite the limited evidence base for the thickened liquid intervention, there was consensus among the included stroke clinical guidelines in recommending the intervention irrespective of its limited empirical support. Further, much of the evidence used to support recommendations was not appropriate, inadequate, not recent and tended to be limited to efficacy evidence.

This suggests less than satisfactory evidence-based practices in formulating recommendations and raises questions regarding the reliability of guidelines as decision-support tools. Suggestions for improvement are made in a number of areas for guideline developers and clinicians and organisations employing guidelines.

**Dr Rosie Gowran**, Lecturer in Occupational Therapy, School of Allied Health, University of Limerick: International Seating Symposium (ISS), University of Pittsburgh. 16th- 23rd March 2019 Bridge the Gap with People's Perspectives on Wheelchair Provision

**Authors:** Ksenia Cheban, Rosemary Joan Gowran

#### Abstract

Wheelchair provision processes fall short when aspiring to meet people's posture, seating and mobility needs across the life course. Major gaps within the provision system exist, affecting health and wellbeing of key stakeholders involved. Individual wheelchair users and families should be front and centre of the provision process, yet they are receiving incomplete services. Ad hoc service delivery systems rarely maintain a holistic approach, focusing on one or two aspects, such as assessment and delivery.

These aspects also lack uniformity, depending on the service attended, the skill of the therapist and vendor, goals prioritised and funding available. Internationally there is a drive to bridge the gaps within the system, to ensure access to appropriate wheelchairs. This one-day workshop will apply a systems thinking approach, addressing all elements, which should be considered when striving to provide services that will meet people's needs throughout life.

It will provide practical solutions to prioritization, information gathering, goal setting, understanding body functions and structures, mat assessment, choosing the right wheelchair and seating, maintaining health and wellbeing across the life course, maintenance and management, outcome measure and sustainability indicators. A whole systems approach is essential, working together as wheelchair professionals to meet this primary assistive technology need.

# Ecosystem

## HRI Clinical Research Support Unit (CRSU)

The HRI Clinical Research Support Unit, based in the CERC (Clinical Education Research Centre) building of University Hospital Limerick provides the high-quality infrastructure and experienced research staff working to required international quality standards that are critical for the successful conduct of regulated and other forms of complex patient-focused research.

In 2019 the CRSU provided research nursing support and services including protocol development, ethics and regulatory advice, patient recruitment, phlebotomy and access to the CRSU Quality Management System. Individual bespoke services were provided as required. The number of studies supported by the unit increased by 62% versus prior year.

The unit is comprised of office and hot desk space as well as board and meeting rooms. In 2019, we opened our dedicated Clinic Rooms to patients for the first time. We have two such rooms, which provide the essentials for any human participation study and associated data entry.

In 2019, the CRSU dealt with over 1000 patients, across 13 studies.

The following studies were supported by the CRSU in 2019

Study	Principal Investigator/ Clinical Lead	Funder	Support
MGP The use of blood-based biomarkers to determine location-specific arterial plaque phenotype in cardiovascular disease: a preliminary study	<b>PI: Dr Eibhlis O'Connor UL</b> <b>Co PI: Prof. Eamon Kavanagh, UHL</b>	Charity; HRI Seed Fund	<b>Research Nursing Support</b> <i>Including Consenting, Sample Preparation, Data Entry, Reporting</i>
HighLow Study: Low molecular weight heparin to prevent recurrent venous thromboembolism in pregnancy: a randomised trial of two doses	<b>Dr Denis O'Keefe, UHL</b>	AMC Medical Research/ HRB Mother & Baby network	<b>Research Nursing Support</b> <i>Including Consenting, Sample Collection and Preparation, Data Entry, Patient Follow-up</i>
StathGuard Stage 2 Clinical investigation of prototype	<b>Prof. Austin Stack, UHL/UL</b> <b>Prof. Leonard O'Sullivan, UL</b>	Enterprise Ireland	<i>Regulatory and Ethical submission Advice</i>
The Mechanical Characterisation of Human Saphenous Vein Tissue	<b>Prof. Eamon Kavanagh, UHL</b> <b>Prof. Michael Walsh, UL</b>	UL/UHL Collaboration	<b>Research Nursing Support</b> <i>Including Consenting, Sample Preparation, Data Recording, Reporting</i>
TiLLIRI: Thrombosis in patients with lower limb injuries requiring immobilisation to identify a group with high predictive VTE risk	<b>Dr Denis O'Keefe, UHL</b>	Industry	<b>Study Coordination;</b> <b>Research Nursing Support</b> <i>Including Training, Data Entry, Data Reporting, Patient Follow up</i>
The Role of Unsteady Wall Shears Stress Stimuli on Human Umbilical Vein Endothelial Cells (HUVECs) Harvested From Umbilical Cords	<b>Dr Mendinaro Imcha, UMHL*</b> <b>Prof. Michael Walsh, UL</b>	UL/UMHL Collaboration	<b>Research Nursing Support</b> <i>Including Consenting, Sample Preparation, Data Entry, Reporting</i>

**\*University Maternity Hospital Limerick**

Study	Principal Investigator/ Clinical Lead	Funder	Support
CONCUSSION <i>Blood biomarkers for diagnosis and prognosis of concussion</i>	<b>Dr John Mulvihill, UL</b>	HRI seed funding	<b>Research Nursing Support</b> <i>Including Consenting, Sample Preparation</i>
CONVINCE <i>Colchicine preventioN of Vascular Inflammation in Non-CardioEmbolic stroke - a randomised clinical trial of low-dose colchicine for secondary prevention after stroke</i>	<b>Dr Margaret O'Connor, UHL</b>	HRB Stroke Clinical TrialsNetwork	<i>Data Entry, Advisory, Patient Follow up</i>
<b>PIPPRA</b> Physiotherapist led Intervention to Promote Physical activity in Rheumatoid Arthritis – a pilot study	<b>Prof. Norelee Kennedy, UL</b>	HRB	<b>Study Coordination; Research Nursing Support</b> <i>Including Sample Preparation, Patient Follow up</i>
<b>OPTIMEND</b> Optimising early assessment and intervention by Health and Social Care Professionals in the Emergency Department	<b>Dr Rose Galvin, UL</b>	HRB	<i>Clinical Research Governance</i>
<b>SOAED</b> Screening of Older Adults in the Emergency Department	<b>Dr Rose Galvin, UL</b>	HRB	<i>Clinical Research Governance</i>
<b>AVF</b> In-vivo Invasive Blood Pressure Monitoring	<b>Prof. Eamon Kavanagh, UHL</b>	HSE	<i>Clinical Research Governance</i>
<b>Pseudomonas</b> Differential Effects of Bacteria Colonising Venous Leg Ulcers on Pain and Healing Rates	<b>Prof. Eamon Kavanagh, UHL</b>	HSE	Ethical Submission Assistance and Advice

In 2018, we reported that the CRSU had become a partner centre of Health Research Board- Clinical Research Coordination Ireland (HRB- CRCI)- an independent, integrated, national clinical research network providing centralised support in the conduct of multicentre clinical trials (both commercial and academic) across Ireland.

This partnership has provided new opportunities for the CRSU in 2019 with one service in particular, HRB-CRCI's Study Feasibility & Start Up (SFS) programme being particularly active. This facility allows an applicant (e.g. pharmaceutical company) to request a study feasibility review in Irish sites. HRB-CRCI disseminates these requests via the local SFS Coordinator in the CRSU- Maria Ryan, Quality and Regulatory Clinical Research Associate.

In 2019, CRCI provided 52 feasibility requests across numerous and varied therapeutic areas, which were then disseminated by the local CRSU SFS coordinator to the clinicians in UHL, and to the HRI Members in UL for the first time.

Besides the activity in this area, we have become an integral part of the many working groups associated with HRB-CRCI and the HRI Director has a seat on the HRB-CRCI Senior Management Team.

This partnership has also enriched the local knowledge base by virtue of the fact that HRB CRCI also hosts the European Clinical Research Infrastructure Network's (ECRIN) European Correspondents for Ireland. The CRSU SFS Coordinator is the local liaison for such interactions and all pertinent information is shared with HRI Members on a regular basis.

The CRSU reports to the HRI Executive on a monthly basis through the Clinical Operations Manager. The composition of the HRI Executive is detailed later in this report.

## Clinical Research Unit

The Clinical Research Unit (CRU) is a collaboration between UL and the UL Hospitals Group, which is jointly governed and resourced. It was established to promote clinical research among and between UL and UL Hospitals staff and is operated through the HRI (UL) and the Office of the Chief Academic Officer (CAO), ULHG. The management of this collaborative unit is through its Management Board, which meets on a monthly basis.

### CRU Management Board 2019:

<b>Prof. Rachel Msetfi</b>	HRI Director
<b>Prof. Paul Burke</b>	Chief Academic Officer (ULHG); Vice Dean Health Sciences
<b>Prof. J. Calvin Coffey</b>	Foundation Chair of Surgery (UL) and Consultant Surgeon (ULHG)
<b>Ms Marie-Thérèse Hayes</b>	Clinical Operations Manager (UL)
<b>Ms Siobhan Egan</b>	(Temporary HSE appointee)



# HRI Executive Committee & Operations Team

Name	Role	Institute/School/ Department	Faculty
Prof. Rachel Msetfi*	HRI Director	Executive Dean, Faculty of Education and Health Sciences	EHS
Prof. Stephen Gallagher* (Jan-Aug 2019)	Assistant Dean Research EHS	Psychology	EHS
Prof. Ann MacPhail* (Sept-Dec 2019)	Assistant Dean Research EHS	Physical Education and Sport Sciences	EHS
<b>THEME LEADS</b>			
Prof. Alan Donnelly*	Theme Lead in Lifestyle & Health	Physical Education and Sport Sciences	EHS
Dr Rose Galvin*	Theme Lead in Health Service Delivery	School of Allied Health	EHS
Prof. Anne MacFarlane*	Theme Lead in Public & Patient Involvement	Graduate Entry Medical School	EHS
Prof. Michael Walsh*	Theme Lead in Health Technologies	School of Engineering	S&E
<b>OPERATIONS TEAM</b>			
Ms Goretti Brady*	Operations Manager	HRI	
Dr Imelda Doolan*	Research Funding Officer	HRI/Research Office	
Dr Ali Sheikhi	Senior Biostatistician	HRI	
Ms Irma Hourigan	Project Manager	HRI	
Ms Karen Kemmy	Senior Administrator	HRI	
Dr Gavin Wilk	Administrator	HRI	
<b>CLINICAL RESEARCH SUPPORT UNIT (CRSU)</b>			
Ms Marie-Thérèse Hayes*	Clinical Operations Manager	HRI/CRSU	
Ms Maria Ryan	Quality and Regulatory CRA	HRI/CRSU	
Ms Elaine Conway	Clinical Nurse Manager	HRI/CRSU	
Ms Rita Hinchion	Clinical Nurse Manager	HRI/CRSU	
Ms Siobhán Egan	Clinical Nurse Manager	HRI/CRU	
Ms Fiona Leahy	Clinical Nurse Manager	HRI/CRU	

\* Member of Executive Committee

**Note:**

The HRI Director and Clinical Operations Manager both have a seat on the Clinical Research Board (CRB). The CRB reports to the Vice President Research, UL and is responsible for the oversight of clinical trial governance on behalf of UL, and for ensuring that UL fulfils all sponsorship requirements.



# Appendix 1:

## HRI Full Members List

Name	Department/School
<b>Dr Joanna Allardyce</b>	School of Allied Health
<b>Dr Ross Anderson</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Norma Bargary</b>	Dept. of Mathematics and Statistics
<b>Dr George Barreto</b>	Dept. of Biological Sciences
<b>Dr Pauline Boland</b>	School of Allied Health
<b>Dr Lydia Bracken</b>	School of Law
<b>Dr Carmel Bradshaw</b>	Dept. of Nursing and Midwifery
<b>Dr Ciara Breathnach</b>	Dept. of History
<b>Dr James Brown</b>	Dept. of Biological Sciences
<b>Dr Roisin Cahalan</b>	School of Allied Health
<b>Dr Mark Campbell</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Eileen Carey</b>	Dept. of Nursing and Midwifery
<b>Dr James Carr</b>	Dept. of Sociology
<b>Dr Brian Carson</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Amanda Clifford</b>	School of Allied Health
<b>Prof. Alice Coffey</b>	Dept. of Nursing and Midwifery
<b>Prof. J. Calvin Coffey</b>	Graduate Entry Medical School
<b>Dr Maurice Collins</b>	School of Engineering and Bernal Institute
<b>Dr Tom Comyns</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Jakki Cooney</b>	Dept. of Biological Sciences
<b>Prof. Susan Coote</b>	School of Allied Health
<b>Dr Barry Coughlan</b>	Dept. of Psychology
<b>Dr Ann-Marie Creaven</b>	Dept. of Psychology
<b>Dr Niamh Cummins</b>	School of Allied Health
<b>Dr Adam de Eyto</b>	School of Design
<b>Dr Tabea de Wille</b>	Dept. of Computer Science and Information Systems
<b>Prof. Alan Donnelly</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Owen Doody</b>	Dept. of Nursing and Midwifery
<b>Prof. Colum Dunne</b>	Graduate Entry Medical School
<b>Dr Khalifa Elmusharaf</b>	Graduate Entry Medical School
<b>Ms Anne Fahy</b>	Dept. of Nursing and Midwifery
<b>Prof. Dick Fitzgerald</b>	Dept. of Biological Sciences
<b>Prof. John Forbes</b>	Health Research Institute / Graduate Entry Medical School
<b>Prof. Donal Fortune</b>	Dept. of Psychology

Name	Department/School
<b>Prof. Sue Franklin</b>	School of Allied Health
<b>Dr Romina Gaburro</b>	Dept. of Mathematics and Statistics
<b>Prof. Stephen Gallagher</b>	Dept. of Psychology
<b>Dr Rose Galvin</b>	School of Allied Health
<b>Prof. Liam Glynn</b>	Graduate Entry Medical School
<b>Dr Rosie Gowran</b>	School of Allied Health
<b>Dr Andreas Grabrucker</b>	Dept. of Biological Sciences
<b>Dr Margaret Graham</b>	Dept. of Nursing and Midwifery
<b>Dr Annmarie Grealish</b>	Dept. of Nursing and Midwifery
<b>Dr James Green</b>	School of Allied Health
<b>Dr Ronni Greenwood</b>	Dept. of Psychology
<b>Dr Anne Griffin</b>	School of Allied Health
<b>Prof. Ailish Hannigan</b>	Graduate Entry Medical School
<b>Prof. Drew Harrison</b>	Dept. of Physical Education and Sport Sciences
<b>Mr Bernard Hartigan</b>	School of Design
<b>Dr Sara Hayes</b>	School of Allied Health
<b>Dr Amanda Haynes</b>	Dept. of Sociology
<b>Ms Therese Hennessy</b>	Dept. of Nursing and Midwifery
<b>Dr Matthew P. Herring</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Siobhan Howard</b>	Dept. of Psychology
<b>Dr Sarah Hyde</b>	Graduate Entry Medical School
<b>Dr Eric Igou</b>	Dept. of Psychology
<b>Prof. Phil Jakeman</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Philip Kearney</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Dervla Kelly</b>	Graduate Entry Medical School
<b>Prof. Norelee Kennedy</b>	School of Allied Health
<b>Dr Ian Kenny</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Patrick Kiely</b>	Graduate Entry Medical School
<b>Dr Louise Kiernan</b>	School of Design
<b>Dr Liz Kingston</b>	Dept. of Nursing and Midwifery
<b>Dr Elaine Kinsella</b>	Dept. of Psychology
<b>Prof. Stephen Kinsella</b>	Dept. of Economics
<b>Dr Louise Larkin</b>	School of Allied Health
<b>Dr Yianna Liatsos</b>	School of English, Irish, and Communication

## Appendix 1: HRI Full Members List (continued)

Name	Department/School
<b>Dr John Lombard</b>	School of Law
<b>Dr Ciarán MacDonncha</b>	Dept. of Physical Education and Sport Sciences
<b>Prof. Anne MacFarlane</b>	Graduate Entry Medical School
<b>Dr Tadhg MacIntyre</b>	Dept. of Physical Education and Sport Sciences
<b>Prof. Hussain Mahdi</b>	Dept. of Electronic and Computer Engineering
<b>Prof. Tiziana Margaria</b>	Dept. of Computer Science and Information Systems
<b>Dr Kathleen Markey</b>	Dept. of Nursing and Midwifery
<b>Dr Tríona McCaffrey</b>	Irish World Academy of Music and Dance
<b>Dr Karen McCreesh</b>	School of Allied Health
<b>Dr Arlene McCurtin</b>	School of Allied Health
<b>Prof. Kieran McDermott</b>	Graduate Entry Medical School
<b>Dr Kieran McGourty</b>	Dept. of Chemical Sciences
<b>Dr Jennifer McMahan</b>	School of Education
<b>Dr Muireann McMahan</b>	School of Design
<b>Dr Pauline Meskell</b>	Dept. of Nursing and Midwifery
<b>Prof. Lee Monaghan</b>	Dept. of Sociology
<b>Dr Lisa Moran</b>	Graduate Entry Medical School
<b>Dr Kellie Morrissey</b>	School of Design
<b>Dr Hilary Moss</b>	Irish World Academy of Music and Dance
<b>Prof. Rachel Msetfi</b>	Centre for Social Issues Research, Dept. of Psychology
<b>Prof. Orla Muldoon</b>	Dept. of Psychology
<b>Dr John Mulvihill</b>	School of Engineering
<b>Dr Carol-Anne Murphy</b>	School of Allied Health
<b>Ms Jill Murphy</b>	Dept. of Nursing and Midwifery
<b>Dr Louise Murphy</b>	Dept. of Nursing and Midwifery
<b>Dr Sylvia Murphy Tighe</b>	Dept. of Nursing and Midwifery
<b>Prof. Paul Murray</b>	Health Research Institute
<b>Dr Orfhlaith Ni Bhriain</b>	Irish World Academy of Music and Dance
<b>Dr Clifford Nolan</b>	Dept. of Mathematics and Statistics
<b>Ms Maria Noonan</b>	Dept. of Nursing and Midwifery
<b>Dr Catherine Norton</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Brid O'Brien</b>	Dept. of Nursing and Midwifery
<b>Ms Anne O'Connor</b>	School of Allied Health
<b>Dr Eibhlis O'Connor</b>	Dept. of Biological Sciences

Name	Department/School
<b>Prof. Clodagh O'Gorman</b>	Graduate Entry Medical School
<b>Dr Sinead O'Keeffe</b>	Electronic and Computer Engineering
<b>Dr Andrew O'Regan</b>	Graduate Entry Medical School
<b>Dr Bernadette O'Regan</b>	Dept. of Chemical Sciences
<b>Dr Pauline O'Reilly</b>	Dept. of Nursing and Midwifery
<b>Dr Deirdre O'Shea</b>	Dept. of Work and Employment Studies
<b>Dr Paraic O'Suilleabhain</b>	Dept. of Psychology
<b>Dr Kieran O'Sullivan</b>	School of Allied Health
<b>Prof. Leonard O'Sullivan</b>	School of Design
<b>Prof. Helen Phelan</b>	Irish World Academy of Music and Dance
<b>Dr Helen Purtil</b>	Dept. of Mathematics and Statistics
<b>Prof. Ita Richardson</b>	Dept. of Computer Science and Information Systems
<b>Dr Katie Robinson</b>	School of Allied Health
<b>Prof. Conor Ryan</b>	Dept. of Computer Science and Information Systems
<b>Dr Elizabeth Ryan</b>	Dept. of Biological Sciences
<b>Dr Nuala Ryan</b>	Dept. of Management and Marketing
<b>Dr Patrick Ryan</b>	Dept. of Psychology
<b>Dr Ruth Ryan</b>	Dept. of Nursing and Midwifery
<b>Dr Nancy Salmon</b>	School of Allied Health
<b>Dr Jon Salsberg</b>	Graduate Entry Medical School
<b>Dr Jean Saunders</b>	Dept. of Mathematics and Statistics
<b>Dr Jennifer Schweppe</b>	School of Law
<b>Dr Ali Sheikhi</b>	Health Research Institute / Dept. of Mathematics and Statistics
<b>Dr Eimear Spain</b>	School of Law / Education and Health Sciences
<b>Prof. Austin Stack</b>	Graduate Entry Medical School
<b>Dr Audrey Tierney</b>	School of Allied Health
<b>Dr Dymna Tuohy</b>	Dept. of Nursing and Midwifery
<b>Dr Pepijn Van de Ven</b>	Dept. of Electronic and Computer Engineering
<b>Prof. Cathal Walsh</b>	MACSI and Dept. of Mathematics and Statistics
<b>Prof. Michael Walsh</b>	School of Engineering
<b>Dr Giles Warrington</b>	Dept. of Physical Education and Sport Sciences
<b>Prof. Catherine Woods</b>	Dept. of Physical Education and Sport Sciences
<b>Dr Aileen Wright</b>	School of Allied Health
<b>Dr Ioannis Zabetakis</b>	Dept. of Biological Sciences

# Appendix 2:

## Decile 1 Papers

- Adamson, P. D., Williams, M. C., Dweck, M. R., Mills, N. L., Boon, N. A., et al. (2019) 'Guiding Therapy by Coronary CT Angiography Improves Outcomes in Patients With Stable Chest Pain', *Journal of the American College of Cardiology*, 74(16), 2058-2070.
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- Hayes, G., Dowd, K. P., MacDonncha, C. and Donnelly, A. E. (2019) 'Tracking of Physical Activity and Sedentary Behavior From Adolescence to Young Adulthood: A Systematic Literature Review', *Journal of Adolescent Health*, 65(4), 446-454.
- Hayes, S., Galvin, R., Kennedy, C., Finlayson, M., McGuigan, C., Walsh, C. D. and Coote, S. (2019) 'Interventions for preventing falls in people with multiple sclerosis', *Cochrane Database of Systematic Reviews*, (11).
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- Holmes, E. M., Leahy, J., Walsh, C. D., White, A., Donnan, P. T. and Lamrock, F. (2019) 'Difficulties arising in reimbursement recommendations on new medicines due to inadequate reporting of population adjustment indirect comparison methods', *Research Synthesis Methods*, 10(4), 615-617.
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## Appendix 2: Decile 1 Papers (continued)

- O'Keeffe, M., Kelly, M., O'Herlihy, E., O'Toole, P. W., Kearney, P. M., *et al.* (2019) 'Potentially modifiable determinants of malnutrition in older adults: A systematic review', *Clinical Nutrition*, 38(6), 2477-2498.
- O'Suilleabhain, P. S., Gallagher, S. and Steptoe, A. (2019) 'Loneliness, Living Alone, and All-Cause Mortality: The Role of Emotional and Social Loneliness in the Elderly During 19 Years of Follow-Up', *Psychosomatic Medicine*, 81(6), 521-526.
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- Pishnamazi, M., Iqbal, J., Shirazian, S., Walker, G. M. and Collins, M. N. (2019) 'Effect of lignin on the release rate of acetylsalicylic acid tablets', *International Journal of Biological Macromolecules*, 124, 354-359.
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