

Dr Faraz Ahmed
Senior Research Associate, Division of Health Research

Faraz is currently a Research Associate at Lancaster University, following his Medical Research Council PhD studentship at the Institute of Public Health (University of Cambridge). Faraz's current work at Lancaster University is within the national Neighbourhoods and Dementia Programme (<http://www.neighbourhoodsanddementia.org/>), which aims to develop the evidence base for dementia training in NHS hospitals (a mixed method study). Viewing the acute hospital as a neighbourhood space increasingly occupied by people living with dementia, his research will examine the impact of dementia training on staff skills, knowledge, confidence and satisfaction, and improved outcomes for patients living with dementia in the acute hospital settings.

Faraz is a Public Health researcher, with extensive experience in international health and working with minority ethnic communities in the UK. Prior to starting his research at the Institute of Public Health (University of Cambridge), he was working as a Research Fellow at the University of York. He holds an MSc in International Health from the University of Leeds and has a strong interest in addressing inequalities in health. His previous experience includes public-private partnerships in increasing TB case-detection among poor and disadvantaged groups, health systems evaluation, and developing and evaluating health promotion programmes for minority ethnic groups.

Research Overview/Interests

Brief summary of current area of work: Neighbourhoods and Dementia Programme (N&D) (PI Dr Siobhan Reilly)

The Improving Dementia Care Lancaster University research team are currently conducting two studies within the [Neighbourhoods and Dementia Programme](#) (2014-2019) funded by the NIHR/ESRC

My research interests focus on patient experience, dementia, equity and health services research. During my education and research, I have worked on a number of mixed methods projects. In addition to receiving training in mixed-methods research at the University of Cambridge during my PhD, I have also received training in qualitative research methods short course from the University of Oxford. The qualitative research method course provided training in conducting qualitative research and various analytical techniques. In my doctoral study, I have specifically used thematic analysis for my qualitative data, and developed a number of mixed-effect regression models to analyse my quantitative data.

Recent Papers

- Burt, J., Campbell, J., Abel, G., Aboulghate, A., **Ahmed, F.**, Asprey, A., Barry, H., Beckwith, J., Benson, J., Boiko, O., Bower, P., Calitri, R., Carter, M., Davey, A., Elliott, M.N., Elmore, N., Farrington, C., Haque, H.W., Henley, W., Lattimer, V., Llanwarne, N., Lloyd, C., Lyratzopoulos, G., Maramba, I., Mounce, L., Newbould, J., Paddison, C., Parker, R., Richards, S., Roberts, M., Setodji, C., Silverman, J., Warren, F., Wilson, E., Wright, C. and M. Roland (2017) Improving patient experience in primary care: a multimethod programme of research on the measurement and improvement of patient experience. *NIHR Programme Grants for Applied Research*, 5 (9). [\[Free full text\]](#)
- **Ahmed, F.**, G.A. Abel, C.E. Lloyd, J. Burt, and M. Roland (2015) Does the availability of a South Asian language in practices improve reports of doctor-patient communication from South Asian patients? Cross sectional analysis of a national patient survey in English general practices. *BMC Family Practice*. 16(1). [\[Free full text\]](#)
- **Ahmed, F.**, J. Burt, and M. Roland (2014) Measuring Patient Experience: Concepts and Methods. *The Patient - Patient-Centered Outcomes Research*, 7(3) pp. 235-241. [\[Free full text\]](#)
- Saunders, C.L., G.A. Abel, A. El Turabi, **F. Ahmed**, and G. Lyratzopoulos (2013) Accuracy of routinely recorded ethnic group information compared with self-reported ethnicity: evidence from the English Cancer Patient Experience survey. *BMJ Open*, 3(6) [\[Free full text\]](#)

Sarah Allinson

Senior Lecturer, Division of Biomedical and Life Sciences

Since joining Lancaster University in 2004, my research activities have been directed towards understanding the processes by which our cells protect themselves from DNA damage. Damage to the DNA in our cells occurs continuously throughout our lifetimes. However, if it remains unrepaired, this damage can cause the accumulation of mutations which are implicated in cancer and other aging-related diseases. Understanding how cells tackle the problem of accurately repairing DNA damage, and how these defensive mechanisms can become compromised, is a major focus of my research.

Biological Effects of Ultraviolet Radiation

Exposure to UV radiation, from either sunlight or the recreational use of sunbeds, is the primary cause of skin cancer, cases of which have risen more than four-fold over the past 40 years. While the effects of short wavelength UV (UVB) are relatively well-understood, the effects of longer wavelength UV (UVA) are less well-studied. UVA is the major UV component of the sun's radiation that reaches the earth's surface and also comprises 99% of the output from sunbeds. UVA is able to generate DNA-reactive free radicals in the skin and these have been implicated in the cancer-causing effects of UVA. Free radical damage, together with its ability to penetrate deep into the dermal layers of the skin, also underlies the well-established link between UVA and skin photoaging, the effects of which are quite distinct from normal chronological aging.

Much of my recent work has been aimed at understanding **how the DNA damage response is activated in skin cells after exposure to UV**. For example we have shown that unexposed cells located adjacent to UVA-exposed cells activate the DNA damage response via the so-called 'bystander effect'. This suggests a mechanism by which UV damage might further propagate into the deeper layers of the skin, with implications for both skin cancer and photoaging.

This work has been supported by Boots UK Ltd, North West Cancer Research and The Dowager Countess Eleanor Peel Trust.

Mechanisms of DNA Repair

As discussed above, it is essential that our cells are able to repair damage to their DNA quickly and accurately. Work in my laboratory aims to understand how some of the enzymes involved in these repair processes normally work and also how their correct functioning can become impaired in the presence of toxic chemicals from the environment and workplace e.g. heavy metals. This work has implications for our **understanding of how such chemicals might contribute to lifetime risk of diseases such as lung cancer**.

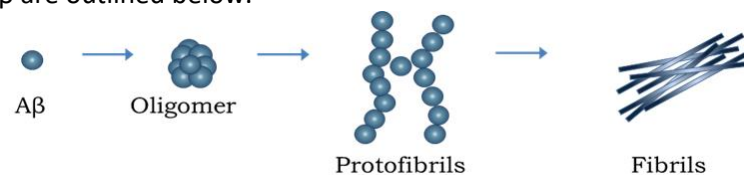
This work has been supported by North West Cancer Research and The Dowager Countess Eleanor Peel Trust.

Professor David Allsop, Division of Biomedical and Life Sciences

My research is concerned with the development of improved methods for the early diagnosis and treatment of some serious diseases of old age, including Alzheimer's disease, Parkinson's disease and late-onset diabetes, and also in understanding the mechanisms of cell damage in these diseases.

Treatments

- The diseases that I work on all have one feature in common, which is the accumulation in affected tissues and organs of long fibres made out of proteins that start to clump together inside or outside of the body's cells. In the case of Alzheimer's disease, these fibres are found at the centre of structures in the brain called 'senile plaques' where they are made from a protein called 'A β '. The stages involved in the formation of these fibres from A β are outlined below.



- Diagram showing how A β sticks together to form long fibrils which accumulate in senile plaques in the brains of victims of Alzheimer's disease. We are developing inhibitors that bind to single A β molecules and stop them from attaching to each other to form oligomers, protofibrils and fibrils. The oligomers and protofibrils are thought to be damaging to brain cells.
- In the case of Alzheimer's disease, we have developed an inhibitor that blocks the assembly of A β into oligomers, protofibrils and fibrils. It also blocks the damaging effects of A β on nerve cells grown in the laboratory. We have also shown that our inhibitor can enter the brain, and reduce the formation of senile plaques and other types of associated brain damage. We are now carrying out further studies to progress this inhibitor into human clinical trials.
- We are following a similar approach for other diseases, including late-onset diabetes. In the latter case, protein fibrils accumulate inside the pancreas and cause the degeneration of the cells that make insulin, which is involved in regulating glucose levels in the blood.

Diagnosis

- We are also measuring various proteins in blood, so that we can develop a simple biochemical test that will aid in the early diagnosis of disease. In the case of Parkinson's disease, for example, we have shown that the levels of a protein called 'phosphorylated α -synuclein' are higher in people with Parkinson's diseases than in normal people without the disease. We are now in the process of assembling a panel of these markers that should allow us to detect this disease in its early stages. We believe that early diagnosis will lead to early intervention, disease management and treatment.

Mechanism of cell damage

- We are study the role of certain metals (particularly iron and copper) in causing cell damage to the brain in neurodegenerative diseases. The abnormal proteins mentioned above interact with these metals to produce highly reactive and damaging molecules called 'reactive oxygen species' and damage due to these types of molecules occurs very early on in the course of Alzheimer's disease.
- Our research has received widespread support from Medical Charities such as The Alzheimer's Society, Alzheimer's Research UK, Parkinson's UK, as well as from government (MRC) and The European Union.

Recent publications

- Gregori M., Taylor M., Salvati E., Re F., Mancini S., Balducci C., Forloni G., Zambelli V., Sesana S., Michael M., Michail C., Tinker-Mill C., Kolosov O., Scherer M., Harris S., Fullwood N.J., Masserini M. & Allsop D. (2017) Retro-inverso peptide inhibitor nanoparticles as potent inhibitors of aggregation of the Alzheimer's A β peptide. *Nanomed: Nanotech. Biol. Med.* 13, 723-732.
- Foulds P.G., *et al.* (2013) A longitudinal study on α -synuclein in blood plasma as a biomarker for Parkinson's disease. *Scientific Reports* 3, DOI:10.1038/srep02540 (2103).
- Maher B.A., *et al.* (2016) Magnetite pollution particles in the human brain. *Proc. Natl. Acad. Sci. USA.* www.pnas.org/cgi/doi/10.1073/pnas.1605941113.

Professor Plamen Angelov
Faculty of Science and Technology

I am leading the Data Science group of the School of Computing and Communications and a Chair in Intelligent Systems. My research interests are broad and gravitate around computational intelligence. This includes bioinformatics. For example, I proposed and developed with research students and associates methods, algorithms and software tools for classification of spectroscopy data, biomarker identification.

I have also interests and work in using video analytics tools to help elderly remember what they have done during the day (VideoDiary app available for free on GooglePlayStore). I have been working toward using home robots and intelligent tools to help elderly. For example, at the moment I am on a research stay at UCLA Centre for SmartHeath working on the "Sensing at risk populations" targeting patients at risk. My role is to detect falls, deterioration of (and more generally, any change in) the condition of patients at risk (UCLA project ARHQ-R01).

I am the Vice President of the International Neural Networks Society which includes a lot of neuroscientists.

Related publications:

1. J. Trevisan, J. Park, **P. P. Angelov**, A. A. Ahmadzai, K. Gajjar, A. D. Scott, P. L. Carmichael, F. L. Martin, Measuring similarity and improving stability in biomarker identification methods applied to Fourier-transform infrared (FTIR) spectroscopy, *Journal of Biophotonics*, vol. **7** (3-4), 254-265, April 2014.
2. J. Trevisan, **P. P. Angelov**, P. L. Carmichael, A. D. Scott and F. L. Martin, Extracting biological information with computational analysis of Fourier transform infrared (FTIR) bio-spectroscopy datasets: current practices to future perspectives, *Analyst*, vol.137, pp. 3202-3215, 2012.
3. J. Trevisan, **P. P. Angelov**, P. L. Carmichael, A. D. Scott and F. L. Martin, Designing open, multi-class computational strategies to classify infrared spectroscopy data derived from the Syrian hamster embryo (SHE) assay, *Mutagenesis*, vol.27(1), p.111, ISSN 0267-8357, 2012.
4. J. Trevisan, **P. P. Angelov**, P. L. Carmichael, A. D. Scott and F. L. Martin, Advances in Fourier-transform infrared spectroscopy analysis to characterise chemical-induced alterations in the Syrian hamster embryo assay-towards biomarkers stability, *Mutagenesis*, vol.27(6), p.792, ISSN 0267-8357, 2012.
5. J. Trevisan, **P. P. Angelov**, P. L. Carmichael, A. D. Scott and F. L. Martin, A computational protocol and software implementation (as a MATLAB application) for biomarker identification in infrared spectroscopy datasets, *Nature Protocols*, May 2010, doi: 10.1038/nprot.2010.97.
6. J. G. Kelly, **P. Angelov**, J. Trevisan, N. Vlachopoulou, E. Paraskevaidis, P.L. Martin-Hirsch, and M.L. Martin, Robust classification of low-grade cervical cytology following analysis with ATR-FTIR spectroscopy and subsequent application of self-learning classifier eClass, *Journal of Analytical and Bio-analytical Chemistry*, November 2010, vol.398 (5), pp. 2191-2201.
7. J. Trevisan, **P. P. Angelov**, I. I. Patel, G. M. Najandb, K. T. Cheung, V. Llabjani, H. M. Pollock, S. W. Bruce, K. Pant, P. L. Carmichael, A. D. Scott, F. L. Martin, Syrian hamster embryo assay (pH 6.7) coupled with infrared spectroscopy and chemometrics towards toxicological assessment, *Analyst*, vol.135 (12), pp. 3266–3272, 2010.
8. J. Trevisan, **P. P. Angelov**, P. L. Carmichael, A. D. Scott, and F. L. Martin, A mathematical framework for spectroscopy data analysis to characterize chemical-induced alterations in the SHE assay, *Mutagenesis*, vol.25 (6), pp. 658-658, 2010.
9. J. Trevisan, **P.P. Angelov**, F.L.A. Martin, Derivation of a computational approach to iteratively discriminate a transformation phenotype in Syrian hamster embryo cells, *Mutagenesis*, **24** (6) 543-543 Nov. 2009.
10. J. Kelly, **P. Angelov**, M. J. Walsh, H. M. Pollock, M. A. Pitt, P. L. Martin-Hirsch and F. Martin, A Self-Learning Fuzzy Classifier with Feature Selection for Intelligent Interrogation of mid-IR Spectroscopy Data Derived from Different Categories of Exfoliative Cervical Cytology, *Intern. Journal on Computational Intelligence Research*, ISSN 0974-1259, **4** (4) 392–401, Dec. 2008.
11. J. A. Iglesias, P. Angelov, A. Ledezema, A. Sanchis, Human Activity Recognition in Intelligent Home Environments: An Evolving Approach, 19th European Conference on AI, ECAI, Lisbon, Portugal, 16-20 August 2010, ECAI 2010 Proceedings (H. Coelho, R. Studer and M. Wooldridge Eds.), IOS Press, ISSN: 0922-6389, pp. 1047-1048.

Dr Theodoros M. Bampouras

Lecturer in Sports Science (Biomechanics), Lancaster Medical School

Keywords: Biomechanics, Muscle mechanics, muscle function, muscle performance, functional ability, balance

I am a biomechanist with interest in muscle mechanics, function and performance, and ageing. My research has covered effect of muscle mechanics on muscle activation capacity, acute muscle power enhancement, muscular imbalances as well as validity and reliability of equipment and testing methods.

With specific reference to ageing, my research revolves around functional ability, balance and gait of older people. It covers the quantitative aspect of assessment of movement and balance and how they are affected by various, everyday conditions.

Example of projects:

- Feasibility of a home-based exercise programme on frailty status of renal patients
- Examination of the effects of carrying shopping bags on balance and gait
- Examination of the effects of head flexion on dynamic stability during gait initiation and walking
- Relationship between gaze and walking and examination of the effect of different 'scenes' on stability

Related publications:

Nixon, A.C., Bampouras, T.M., Pendleton, N., Mitra, S., Brady, M.E., Dhaygude, A. (2019). Frailty is independently associated with worse health-related quality of life in chronic kidney disease: a secondary analysis of the 'Frailty Assessment in Chronic Kidney Disease' Study. *Clinical Kidney Journal*, 1-10.

Nixon, A.C., Bampouras, T.M., Pendleton, N., Mitra, S., Dhaygude, A. (2019). Diagnostic accuracy of frailty screening methods in advanced chronic kidney disease. *Nephron*, 141,147-155.

Thomas, N.M., Donovan, T., Dewhurst, S., Bampouras, T.M. (2018). Visually fixating or tracking another person decreases balance control in young and older females walking in a real-world scenario. *Neuroscience Letters*, 677, 78-83.

Maslivec, A., Bampouras, T.M., Dewhurst, S., Macaluso, A., Vannozzi, G., Laudani, L. (2017). Mechanisms of head stability during gait initiation in young and older women: a neuro-mechanical analysis. *Journal of Electromyography and Kinesiology*, 38, 103-110.

Nixon, A.C., Bampouras, T.M., Pendleton, N., Woywodt, A., Mitra, S., Dhaygude, A. (2017). Frailty and chronic kidney disease: current evidence and continuing uncertainties. *Clinical Kidney Journal*, 11(2), 236-245.

Thomas, N.M., Dewhurst, S., Bampouras, T.M., Donovan, T., Macaluso, A., Vannozzi, G. (2017). Smooth pursuits decrease balance control during locomotion in young and older healthy females. *Experimental Brain Research*, 235(9), 2661-2668.

Maslivec, A., Bampouras, T.M., Dewhurst, S. (2017). Head flexion and different walking speeds do not affect gait stability in older females. *Human Movement Science*, 55, 87-93.

Thomas, N.M., Bampouras, T.M., Donovan, T., Dewhurst, S. (2016). Eye movements affect postural control in young and older females. *Frontiers in Aging Neuroscience*. <http://dx.doi.org/10.3389/fnagi.2016.00216>.

Bampouras, T.M., Dewhurst, S. (2016). Carrying shopping bags does not alter static postural stability and gait parameters in healthy older females. *Gait and Posture*, 46, 81-85.

Dewhurst, S., Peacock L., Bampouras, T.M. (2015). Postural stability of older female Scottish country dancers in comparison to physically active controls. *Journal of Aging and Physical Activity*, 23, 128-132.

Dewhurst, S., Bampouras, T.M. (2014). Intra-day reliability and sensitivity of four functional ability tests in older females. *American Journal of Physical Medicine and Rehabilitation*, 93(8), 703-707.

Dewhurst, S., Nelson, N., Dougall, P., Bampouras, T.M. (2014). Scottish country dance: benefits to functional ability in older women. *Journal of Aging and Physical Activity*, 22, 146-153.

Dr Amanda Bingley

Lecturer, Division of Health Research, Faculty of Health and Medicine

Keywords: Therapeutic landscapes and greenspace, participatory arts

Research specific to ageing listed below

Ageing Playfully: Co-designing interactive and playful ways to encourage dementia-friendly exercise and movement (2015) AHRC Creative Exchange funded. Working in the community in creative arts workshops with people at the early stages of Dementia, their caregivers and Age UK, with the aim of empowering workshop participants to becoming designers themselves through a number of creative and playful activities. Since the end of the project the team have designed the 'Ageing Playfully' cards that offer people guidance to set up similar creative workshops and activities with people with dementia.
http://imagination.lancs.ac.uk/activities/Ageing_Playfully

Tseklevs, E., Bingley, A. F., Lujan Escalante, M., & Gradinar, A. I. (2018). Engaging people with dementia in designing playful and creative practices: Co-design or co-creation? *Dementia*. DOI: 10.1177/1471301218791692
Lujan Escalante, M. A., Tseklevs, E., Bingley, A. F., & Gradinar, A. I. (2017). [*Ageing playfully: a story of forgetting and remembering*](#) . *Design for Health*, 1(1), 134-145

Woodland working: Intergenerational skills gained and shared in the volunteer workforce (2014) with Dr Alison Collins and Dr Sandra Varey in collaboration with independent Chartered Forester consultant Rebecca Oaks (MICFor).

- A British Academy funded. Worked with conservation volunteers in 3 workgroups in the North West some older and old older age, sharing skills and training younger volunteers. Exploring their experience of managing physically rigorous and challenging tasks as they age; why and how they choose to volunteer in conservation and how they benefit in terms of wellbeing from the greenspace environment, and the intergenerational skills sharing and social interaction.

Bingley, A., Collins, A., Varey, S., & Oaks, R. (2014). *Balancing acts of work in the third sector: older volunteers' experience in woodland conservation*. Presented at The Third Sector, the State and the Market: Challenges and Opportunities in an Era of Austerity, Sheffield, UK.

Men in Sheds project (2012) with Prof Christine Milligan, Prof Sheila Payne and Dr Zoe Cockshott. Commissioned and funded by Age UK.

- A service evaluation of the Age UK Men in Sheds (MiS) project, that provides venues and support for retired older men to share creative activities (e.g. wood or metal crafts, restoring furniture etc). We interviewed older men and support staff during site visits to three MiS groups evaluating the benefits, challenges and sustainability of MiS. This is felt to be a very successful activity for the majority of the men we interviewed, supporting their social and mental well-being.

Milligan, C., Payne, S., Bingley, A., & Cockshott, Z. (2015). Place and wellbeing: shedding light on activity interventions for older men. *Ageing and Society*, 35(1), 124-149. DOI: 10.1017/S0144686X13000494

Supervision:

Graduated 2018: ESRC CASE studentship (with Blackburn with Darwen Public Health) ESRC PhD Graduate: Maaria Atcha:
Thesis title: "Access to dementia diagnosis and support in a diverse South Asian community: A qualitative study"

ESRC Studentship (currently studying 2015-2019): Annabelle Edwards: her doctoral research explores the experience of therapeutic landscape and includes older conservation volunteers and ramblers and people on meditation retreats.

Dr Gavin Brookes
Senior Research Associate, Linguistics and English Language

Gavin is a Senior Research Associate within the ESRC Centre for Corpus Approaches to Social Science (CASS) in the Department of Linguistics and English Language at Lancaster University. As a linguist, Gavin is interested in the ways in which language but also images are used to represent illnesses and other health-related phenomena and our experiences and understandings of them. Gavin's research to-date has addressed topics such as dementia, mental health, chronic illness, and patient feedback on healthcare experiences. Gavin tends to adopt a corpus linguistic methodology which involves using specialist computer programs to analyse vast collections of textual data (i.e. typically millions and sometimes billions of words). For example, Gavin's current work within CASS utilises a 36 million-word collection of UK newspaper articles about obesity to explore how this health topic is represented (read more here: <http://cass.lancs.ac.uk/corpus-approaches-to-healthcare-communication/representations-of-obesity-in-the-news/>). Recent publications include:

- Hunt, D. and Brookes, G. (2020). *Corpus, Discourse and Mental Health*. London: Bloomsbury.
- Brookes, G. and McEnery, T. (2020). Correlation, collocation and cohesion: A corpus-based critical analysis of violent jihadist discourse. *Discourse & Society*. Online first.
- Baker, P., Brookes, G. and Evans, C. (2019). *The Language of Patient Feedback: A Corpus Linguistic Study of Online Health Communication*. London and New York: Routledge.

Gavin's research on dementia utilises quantitative methods from corpus linguistics but also qualitative multimodal discourse analysis to examine how dementia, people with it, and their relatives and carers are represented in contemporary media, for example in the context of the press, commercial stock images, and charity campaigns. His recent publications on dementia and ageing include:

- Brookes, G., Putland, E. and Harvey, K. (forthcoming). 'Multimodality: An analysis of dementia representation in charity campaigns'. In: G. Brookes and D. Hunt (Eds.), *Analysing Health Communication: Discourse Approaches*. Basingstoke: Palgrave Macmillan. In Press.
- Harvey, K. and Brookes, G. (2019). Looking through dementia: what do commercial stock images tell us about aging and cognitive decline? *Qualitative Health Research*, 29(7), 987-1003.
- Lampropoulou, S., Koleva, K., Harvey, K., Brookes, G. (2019). Linguistic approaches. In: J. Billington (Ed.), *Reading and Mental Health*. Basingstoke: Palgrave Macmillan, pp. 241-263.
- Brookes, G., Harvey, K., Chadborn, N. and Denning, T. (2018). "Our biggest killer": multimodal discourse representations of dementia in the British press. *Social Semiotics*, 28(3), 371-395.

Dr Sue Broughton, Lecturer, Division of Biomedical and Life Sciences

Investigating the Role of Diet and Insulin/IGF-like Signalling in Brain Ageing

Improvements in healthcare and life style in many countries have resulted in increased health and life expectancy. The downside is that more people are now living long enough to experience the diseases and loss of physical and mental function that come with ageing. Therapeutic interventions that can improve health and function at older ages are thus much needed in our ageing society. A major breakthrough in research into the biology of ageing has been the discovery that it is possible to extend the normal lifespan of laboratory model organisms such as yeast, the fruit fly, the nematode worm and the mouse. Encouragingly these long-lived animals appear to remain healthy for longer than normal animals. The regulation of lifespan in these very different kinds of organisms has been found to involve similar mechanisms, opening up the use of the much simpler and shorter-lived invertebrate organisms (worms and flies) to understand human ageing.

In particular, diet and the cellular nutrient sensing signalling pathways, Insulin/IGF-like and TOR, have been found to be very important in regulating lifespan in model organisms. Dietary restriction and reducing cellular signalling extend lifespan and evidence is accumulating that they slow down the decline with age of some indicators of health such immune and motor function. Although these health benefits have been observed, very little is yet known about the effects of these lifespan extending interventions on mental health and function. Insulin-like signalling for example plays an important role in the survival and function of neurons in the brain. This intriguing fact together with the increasing need to find ways of maintaining mental functions into older ages in humans led me to take ageing research into the brain of the fruit fly, *Drosophila melanogaster*. My research aims to understand how the brain ages and to determine if behavioural health can be improved at older ages by lifespan extending reductions in diet or insulin signalling.

I carry out my research in the fruit fly, *Drosophila melanogaster*, because it is a principal model organism of both ageing and behavioural research. The fly performs complex behaviours controlled by the brain which decline with age as they do in humans. Moreover, the fly's brain has similarities to those of mammals and has been used to study neurodegenerative diseases producing important results that are directly applicable to humans. My research involves genetically manipulating genes under different dietary conditions and determining the effects on brain ageing. An exploratory walking behaviour is used as a measure of brain function throughout the life of the flies to determine brain ageing. Recently, I have shown that both dietary restriction and reduced insulin signalling in the brain of flies do not benefit the normal ageing of exploratory walking behaviour despite extending lifespan. These findings raise the possibility that the brain ages differently to the body and may not be improved by lifespan extending interventions. Thus, there is a great need to understand the differences between ageing in the brain and body if we are to improve all types of health at older ages in humans. My research has the exciting prospect of providing a greater understanding of the molecular processes underlying brain ageing and candidate genes/mechanisms that can be tested for their ability to reduce mental decline due to normal brain ageing or neurodegenerative disease.

Selected publications

Liao S, **Broughton S** and Nässel DR (2017) Behavioral Senescence and Aging-Related Changes in Motor Neurons and Brain Neuromodulator Levels Are Ameliorated by Lifespan-Extending Reproductive Dormancy in *Drosophila*. *Front. Cell. Neurosci.* 11:111. doi: 10.3389/fncel.2017.00111

M.Z.B. Haji Ismail, M.D. Hodges, M. Boylan, R. Achall, A.D. Shirras & **S.J Broughton** (2015) The *Drosophila* Insulin Receptor Independently Modulates Lifespan and Locomotor Senescence. *PLoS ONE* 10(5): e0125312. doi:10.1371/journal.pone.0125312.

N. Alic, J. M. Tullet, T. Niccoli, **S. Broughton**, M. P. Hoddinott, C. Slack, D. Gems, and L. Partridge. (2014) Cell-Nonautonomous Effects of dFOXO/DAF-16 in Aging. *Cell Rep* 6(4):608-16.

S.J. Broughton, C. Slack, N. Alic, A. Metaxakis, T.M. Bass, Y. Driege and L. Partridge. (2010) DILP-producing Median Neurosecretory Cells in the *Drosophila* Brain Mediate the Response of Lifespan to Nutrition. *Ageing Cell* 9: 336-346.

S.J. Broughton and L. Partridge. (2009) Insulin/IGF-like Signalling, the Central Nervous System and Ageing. (Invited Review). *Biochem J.* 418:1-12.

Dr Garuth Chalfont**Research Associate, Division of Health Research, Faculty of Health and Medicine**

Keywords: Dementia, treatment, multimodal, non-pharmacological, intervention

Garuth is a contract researcher within the Division of Health Research. Projects have included PACE (EU project on the effectiveness of palliative care in long term care facilities across Europe), InSup-C Project (Patient-centered integrated palliative care pathways in advanced cancer and chronic disease) and an evaluation of the Wigan & Leigh 'Hospice in your Care Home' project. His fields include music, geography and landscape architecture, culminating in a PhD in Architecture.

After a decade of involvement improving dementia care environments, his work now focuses on treatment of the root causes of dementia. Largely encouraged by progress outside the UK...

(see Bredesen, D. E, et al (2018). Reversal of cognitive decline: 100 patients. *Journal Of Alzheimer's Disease & Parkinsonism*, 8(5), 1-6. doi:10.4172/2161-0460.1000450)

... he secured funding and developed an intervention protocol with the NHS Memory Assessment Services. In a controlled trial, a post-diagnosis root cause investigation will be provided by integrative/functional medicine GPs. Patients will receive a multimodal lifestyle prescription agreed by their own GP. They will be supported in behavioural change by volunteer health coaches and education addressing the root causes. Participation in community garden projects for food growing and social interaction will be enabled and encouraged near to where they live.

- **Chalfont, G.**, Milligan, C., & Simpson, J. (2018). A mixed methods systematic review of multimodal non-pharmacological interventions to improve cognition for people with dementia. *Dementia: The International Journal of Social Research and Practice*, 1-45. doi:10.1177/1471301218795289 [Free download](#) <https://journals.sagepub.com/doi/pdf/10.1177/1471301218795289>
- **Chalfont, G.**, Simpson, J., Shukla, Y., Venkateswaran, V., & Milligan, C. (2018). Whole Systems Dementia Treatment: An Emerging Role in the NHS? *Morecambe Bay Medical Journal*, (in press).
- White, P. C. L., Wyatt, J., **Chalfont, G.**, Bland, J. M., Neale, C., Trepel, D., & Graham, H. (2017). Exposure to nature gardens has time-dependent associations with mood improvements for people with mid- and late-stage dementia: Innovative practice. *Dementia: The International Journal of Social Research and Practice*. doi:10.1177/1471301217723772
- **Chalfont, G.**, & Walker, A. (2013). *Dementia Green Care Handbook of Therapeutic Design and Practice*. Arizona: safehouse books. [Free download](#) <http://chalfontdesign.com/>
- **Chalfont, G. E.** (2011). Charnley Fold: A Practice Model of Environmental Design for Enhanced Dementia Day Care. *Social Care and Neurodisability*, 2(2), pp.69-78.
- **Chalfont, G. E.** (2008). The Living Edge: Connection to nature for people with dementia in residential care. In Froggatt, K. A., Davies, S. & J. Meyer (Eds.) *Understanding Care Homes: A Research and Development Perspective*. pp. 109-131. London: Jessica Kingsley Publishers.
- **Chalfont, G. E.** (2008). *Design for Nature in Dementia Care*. Bradford Dementia Group Good Practice Guide. London: Jessica Kingsley Publishers.

David Clancy

Lecturer, Division of Biomedical and Life Sciences

Keywords: Ageing, genetics, *Drosophila*, mitochondria

Genetics and biology of ageing. Ageing is the process which increases the chance of death over time. Because fundamental causes of ageing at the level of molecules within cells are similar across species, I do a lot of my work (though not all) using a model organism, the fruit fly *Drosophila melanogaster*. As a living subject of research it has many benefits: short generation time and lifespan, easy to breed in large numbers, comprehensive and well established genetic manipulation techniques, no ethics considerations, and essential similarities with humans at biochemical, cellular and genetic levels.

Seeking genes which modulate the ageing process. I have been selecting for extreme longevity in flies in order to discover new genes for longevity-assurance. Altering their expression can then identify possible anti-ageing targets for drug treatment.

Measuring biochemical damage and testing its relevance to ageing. This process of damage is mitigated by our genetic makeup, which helps explain the huge variation in lifespan we see across species. Currently the lab is measuring the effects of deletions in the DNA of mitochondria, cell components which make energy as well as a host of other critical functions. These measures may provide useful biomarkers of ageing, to indicate risk of age-related disease, or to monitor efficacy of treatments.

Genetics of early cardiac death in men. Males suffer from early cardiac death 4-5 times more than females, but the reasons are not known. An evolutionary theory involving mitochondria, along with some human genetic data as well as some experiments on early death in fruit flies, suggest that mitochondrial genes may be a good place to look for an answer to this puzzle. I am looking at (human) UK Biobank genetic data to try to answer this question.

Nagarajan-Radha, V, Aitkenhead, I, **Clancy, DJ**, Chown, SL and Dowling, DK (2019) Sex-specific effects of mitochondrial haplotype on metabolic rate in *Drosophila melanogaster* support predictions of the Mother's Curse hypothesis. *Philosophical Transactions of the Royal Society* (in press).

Drummond, E, Short, E and **Clancy, D** (2019) Mitonuclear gene X environment effects on lifespan and health: How common, how big? *Mitochondrion*. **49**: 12-18 .

Wolff JN, Camus MF, **Clancy DJ**, Dowling DK (2016) Complete mitochondrial genome sequences of thirteen globally sourced strains of fruit fly (*Drosophila melanogaster*) form a powerful model for mitochondrial research. *Mitochondrial DNA*. **28**:1-3.

Clancy, DJ and Birdsall, J (2013) Flies, worms and the Free Radical Theory of Ageing *Ageing Research Reviews* **12**: 404-12.

Koudounas, S, Green, EW and **Clancy, DJ** (2012) Reliability and variability of sleep and activity as biomarkers of ageing in *Drosophila* *Biogerontology*, **13**: 489-99.

Camus MF, **Clancy DJ**, Dowling DK (2012) Mitochondria, Maternal Inheritance, and Male Aging *Current Biology* **22**: 1717-21.

Dr Trevor J. Crawford

Reader of Neuropsychology, Department of Psychology & Centre for Aging Research

A new diagnostic marker for Alzheimer's Disease (AD)

Dementia is a worldwide problem, largely associated with the ageing process although it can occur in younger people where it is more likely to have a genetic component. There are many forms of dementia, Alzheimer's being one of them. Because we are currently living in a time when people are living far longer than they have done previously, more people are being diagnosed with Alzheimer's and the incidence is likely to rise considerably. However, it only affects a smallish proportion of the population and there is increasing hope on the horizon.

There is now quite a body of knowledge about what is happening in the brain when Alzheimer's is present but what is lacking are effective diagnostic tools. Currently, the most reliable ones are a brain scan or a lumbar puncture, both of which are invasive, expensive procedures and carry risks. The alternative, at present, is psychological testing but in all of these cases, it is likely that the disease is well-developed before symptoms manifest and therefore these tests come rather late in the day.

What is required is a diagnostic tool which would detect changes in the brain at a much earlier stage which is where our current research comes in. We are using an eye-gazing technique to try and determine whether it is possible via a special eye test to determine whether such changes are taking place. The research is still on-going with people who have a diagnosis of Alzheimer's, older healthy people and also younger people as a comparison. Although it is still too early to tell, our initial findings are promising and suggest that this method might be able to detect these changes. If so, this would be a relatively cheap, non-invasive test which could be given along with a routine eye test anywhere in the world and would be a major breakthrough, enabling new treatments to be targeted at an early stage in the course of the disease.

Trevor is about to embark on a three year EPSRC grant commencing Jan 2015 to develop non-invasive eye-tracking systems to monitor dementia in the home environment in Collaboration with Pete Sawyer (PI), Hans Gellersen & Ira Leroi – University of Manchester.

Dr Neil Dawson**Lecturer, Division of Biomedical Life Sciences, Faculty of Health and Medicine**

In my laboratory we are interested in further understanding the neurobiology of age-related neurodegenerative diseases, including Alzheimer's and Parkinson's Disease, in the hope that we can develop new, effective therapies to treat these disorders. We are particularly interested in elucidating how risk factors for these diseases impact on brain functioning and various aspects of cognition, and how these alterations evolve over the progression of these diseases. We test the validity of new and emerging therapeutics for these disorders using preclinical models, providing essential data that facilitates the testing of these drugs in clinical trials. We are also interested in identifying early-stage biomarkers for these diseases, such as protein levels in the blood. This would allow for the earlier diagnosis and treatment of these diseases, reducing the impact for both the disease sufferer and their carers.

Fiona Eccles**Lecturer on the Doctorate in Clinical Psychology, part of the Division for Health Research**

As a clinical psychologist, my research interests are in the cognitive, emotional and social aspects of neurological conditions. I am particularly interested in neurodegenerative conditions including Parkinson's disease, multiple sclerosis, Huntington's disease and motor neurone disease. I am interested in the everyday experience of people living with these conditions as well as associated cognitive difficulties. I am also interested in predictors of wellbeing and in developing psychological therapies to help people (and their relatives) live well with these conditions.

Current projects

- Minds and movement: A project funded by the British Psychological Society to develop guidance for working psychologically with people with motor neurodegenerative conditions
- Mindfulness for people with Huntington's disease: We are interested in developing a mindfulness-based programme to improve wellbeing for people who are pre-symptomatic or at an early disease stage.

Relevant recent publications

Morgan, A., Eccles, F., & Greasley, P. (2019). Experiences of living with dystonia. *Disability and Rehabilitation*.
<https://doi.org/10.1080/09638288.2019.1645217>

Simpson, J., Dale, M., Theed, R., Gunn, S., Zarotti, N., & Eccles, F. (2019). Validity of irritability in Huntington's disease: A scoping review. *Cortex*, 120, 353-374. <https://doi.org/10.1016/j.cortex.2019.06.012>.

Moore, J., Eccles, F. J. R., & Simpson, J. (2019). Post-diagnostic lived experiences of individuals with essential tremor. *Disability and Rehabilitation*. <https://doi.org/10.1080/09638288.2019.1574915>

Simpson, J., Chatzidamianos, G., Fletcher, I., Perpetuo, L., & Eccles, F. (2018). A new scale measuring adaptive perceived control for people with Parkinson's: Initial construction and further validation. *Journal of the Neurological Sciences*, 391, 77-83.
<https://doi.org/10.1016/j.jns.2018.05.023>

Regan, L., Preston, N. J., Eccles, F. J. R., & Simpson, J. (2018). The views of adults with Huntington's disease on assisted dying: a qualitative exploration. *Palliative Medicine*, 32(4), 708-715. <https://doi.org/10.1177/0269216317741850>

Theed, R., Eccles, F. J. R., & Simpson, J. (2018). Understandings of psychological difficulties in people with the Huntington's disease gene mutation and their expectations of psychological therapy. *Psychology and Psychotherapy: Theory, Research and Practice*, 91(2), 216-231.
<https://doi.org/10.1111/papt.12157>

Regan, L., Preston, N. J., Eccles, F. J. R., & Simpson, J. (2017). The views of adults with neurodegenerative diseases on end-of-life care: a metasynthesis. *Aging and Mental Health*.

Theed, R., Eccles, F. J. R., & Simpson, J. (2017). Experiences of caring for a family member with Parkinson's disease: a meta-synthesis. *Aging and Mental Health*, 21(10), 1007-1016. <https://doi.org/10.1080/13607863.2016.1247414>

Warren, E., Eccles, F. J. R., Travers, V., & Simpson, J. (2016). The experiences of being diagnosed with Parkinson's Disease. *British Journal of Neuroscience Nursing*, 12(6), 288-296. <https://doi.org/10.12968/bjnn.2016.12.6.288>

Theed, R., Eccles, F. J. R., Travers, V., & Simpson, J. (2016). The recognition and management of psychological difficulties in individuals with Parkinson's Disease: perspectives of the Parkinson's Disease nurse specialist. *British Journal of Neuroscience Nursing*, 12(3), 132-139.
<https://doi.org/10.12968/bjnn.2016.12.3.132>

Dr Ian Fletcher

**Senior lecturer and clinical psychologist in the Division of Health Research,
Faculty of Health and Medicine**

Older people research interests

The relationships between compassionate care/empathy and communication between older people and their caregivers, which includes both professional (doctors, nurses, care staff) and non-professional carers i.e. family, close friends.

The relationships between fear of falling and psychological characteristics i.e. the individual differences that facilitate or inhibit recovery after older people experience a fall.

Investigating a psycho-educational programme focused on memory in older age to promote positive changes in beliefs and behaviour.

Exploring the experiences of carers (professional and non-professional) when they are face challenging behaviours of older people.

Compassion and emotional regulation in the context of caring for the frail elderly in a multidisciplinary older adult care team (MOAT). The purpose of a MOAT is to provide input from professionals in medicine, nursing, occupational therapy, physiotherapy and social services to support an older person's care. The frequency of MOAT meetings to discuss and plan an older person's care varies within and between hospitals, from as much as twice a day to as little as once per week.

Dr Amy Gadoud
Senior Clinical Lecturer, Division of Health Research

I am a consultant in palliative medicine at Cumbria Partnership and have funded research time as an honorary senior lecturer at the International Observatory on End of Life Care, Lancaster University. I was (2013-2016) a NIHR clinical lecturer at Hull York Medical School. I have been an invited speaker at Kings College, London, University of Liverpool and University of Sheffield. I have obtained research funding from major bodies e.g. NIHR and Academy of Medical Sciences. My research interest is palliative care for people with heart failure, a disease of older people and use a range of research methods from analysing large datasets to qualitative studies.

Dr Chris Gaffney
Lecturer in Sports Science, Lancaster Medical School

Research Profile

I am an Early Career Researcher based in Lancaster Medical School with expertise in Metabolic Physiology and Type II Diabetes. My work involves applied work and clinical trials with human volunteers, and mechanistic studies using the model organism: *C. elegans*. Since moving to Lancaster, two of my studies have been funded to determine the minimal amount of exercise to improve the control of blood sugar levels. We are seeking to determine whether this is different in older volunteers versus younger volunteers and whether this minimum amount is further altered in those with type II diabetes. These trials have been funded by the Physiological Society and the Joy Welch Educational Charitable Trust, respectively.

I am also a collaborator on the BBSRC-funded Molecular Muscle Experiment (MME: BB/N015894/1), which seeks to determine the molecular mechanisms of muscle loss in spaceflight. This is the first UK-led experiment on board the International Space Station and has been the source of significant media attention (e.g. BBC Breakfast, National newspapers e.g. Daily Mail, Daily Express). We are interested in spaceflight research to one day enable a manned mission to Mars but also to understand the ageing process on Earth more thoroughly. Spaceflight is considered a model of accelerated ageing, and hence our work in space may help in the area of ageing on Earth.

Key words

Spaceflight; type II diabetes; skeletal muscle; metabolism

Selected Publications

Hewitt, J., Pollard, A., Lesanpezeshki, L., Deane, C., **Gaffney, C.J.**, Etheridge, T., Szewczyk, N. & Vanapalli, S. Muscle strength deficiency and mitochondrial dysfunction in a muscular dystrophy model of *C. elegans* and its functional response to drugs. *Disease Models & Mechanisms*. In Press.

Gaffney, C. J., Mansell, P., Stephens, F. B., Macdonald, I., & Tsintzas, K. (2017). Exercise metabolism in non-obese patients with type II Diabetes following the acute restoration of normoglycaemia. *J Diabetes Res*, 8248725.

Samms, R. J., Lewis, J. E., Norton, L., Stephens, F. B., **Gaffney, C. J.**, Butterfield, T., Smith, D. P., Cheng, C., Perfield, J., Adams, A. C., Ebling, F. J., & Tsintzas, K. (2017). FGF21 is an insulin-dependent postprandial hormone in adult humans. *J Clin Endocrinol Metabolism*, **102**, 3806-3813.

Gaffney, C. J., Fomina, E., Babich, D., Kitov, V., Uskov, K. & Green, D. A. (2017). The effect of long term confinement and the efficacy of exercise countermeasures on muscle strength during a simulated mission to Mars: data from the Mars500 study. *Sports Medicine – Open*, **3**, 40.

Gaffney, C.J., Shepherd, F., Chu, J., Baillie, D. L., Rose, A., Constantin-Teodosiu, T., Greenhaff, P. L. & Szewczyk, N. J. (2016). Degenerin channel activation causes caspase-mediated protein degradation and mitochondrial dysfunction in adult *C. elegans* muscle. *J Cachexia Sarcopenia Muscle*, **7**, 181-192.

Dr Andrew Harding

Senior Research Associate, Faculty of Health and Medicine

Keywords: Dementia, core outcomes, Delphi, Qualitative, Specialist housing, Realist methodology

Andrew has experience of mostly qualitative, mixed method and realist research approaches. Andrew's main research interests are in and often cut across social gerontology, dementia, specialist housing, welfare reform and wider health and social care policy. He has a particularly long-standing interest on the impact of welfare, social and public policy reform on older people, with a particular interest in marketisation policies, choice, decision-making and information-giving across health, social care and housing.

He is currently working on the EU JPND mySupport study, which assesses the impact of an intervention that supports care home staff and family carers to make best interest decisions about relatives with advanced dementia. In his previous role, Andrew was part of a multi-disciplinary team that developed a core outcome set for non-pharmacological and community based health and social care programmes for people with dementia living at home. This work was part of the ESRC/NIHR Neighbourhoods and Dementia programme (2014-2019), funded as a part of the Prime Minister's 2012 Challenge on Dementia. He has also presented at national and international conferences. Andrew is an active reviewer for journals and funding agencies. He is an active peer reviewer for BMC Health Services Research; The Journal of Public Health; Dementia; Housing, Care and Support; Evaluation; Journal of Social Policy; PLOS One and has reviewed funding proposals for the NIHR RfPB and Dunhill Medical Trust.

Key publications:

Reilly, S.T., **Harding, A.J.E.**, Morbey, H., et al. (2020) What is important to people with dementia living at home? A set of core outcome items for use in the evaluation of non-pharmacological community-based health and social care interventions. *Age and Ageing*

Harding, A.J.E., Hean, S., Parker, J and Hemingway, A. (2019) "It can't really be answered in an information pack...": A realist evaluation of a telephone housing options service for older people. *Social Policy and Society*, 1-18. doi:10.1017/S1474746419000472.

Harding, A.J.E., Morbey, H., Ahmed, F., et al (2018) What is important to people living with dementia?: the 'long-list' of outcome items in the development of a core outcome set for use in the evaluation of non-pharmacological community-based health and social care interventions. *BMC Geriatrics*, 19: 94, <https://doi.org/10.1186/s12877-019-1103-5>

Morbey, H., **Harding, A.J.E.**, Swarbrick, C., Ahmed, F., Elvish, R., Keady, J., Williamson, P. & Reilly, S.T. (2019) Involving people living with dementia in research: an accessible modified Delphi Survey for core outcome set development. *Trials*, 20: 12, <https://doi.org/10.1186/s13063-018-3069-6>

Harding, A.J.E., Parker, J., Hean, S. & Hemingway, A. (2018) Supply-side review of the UK specialist housing market and why it is failing older people. *Housing, Care and Support*, 21 (2), 41-50 <https://doi.org/10.1108/HCS-05-2018-0006>

Harding, A.J.E. and Pritchard, C. (2016) UK and Twenty Comparable Countries GDP-Expenditure on- Health 1980-2013: The Historic and Continued Low Priority of UK Health Related Expenditure. *International Journal of Health Policy and Management*, 5 (9), 519-523, DOI: [10.15171/IJHPM.2016.93](https://doi.org/10.15171/IJHPM.2016.93)

Harding, A.J.E., Sanders, F., Medina Lara, A., et al. (2014) Patient Choice for Older People in English NHS Primary Care: Theory and Practice. ISRN Family Medicine, <http://dx.doi.org/10.1155/2014/742676>

Professor Niall Hayes

Professor of Information and Organisation, Management School, Organisation, Work and Technology

Keywords: Open data; co-creation, practice perspective, information systems; rural

My disciplinary expertise is in the areas of organisation studies and the social aspects of information systems. I have recently drawn upon this background to try to understand the issues pertaining to the provision of independent living services to older adults in a rural setting. What I lack is the disciplinary expertise in gerontology. I am hoping that being associated with C4AR I will address this gap over time

I sketch out some interests and current work that I hope will be of interest to C4AR and lead to collaborations:

Co-creating services with older adults. I am currently working in South Lakeland co-creating a mobile application to address social connectedness. I would be keen to continue this research on loneliness and social isolation in other settings.

Open Data is another area I have an interest in. I am keen to work with groups to identify relevant existing open data and to develop strategies to open new data. Here data may also become the basis for the provision of new anticipated and unanticipated services. Data is also able to be used by multiple organisations. A related point would-be how-to curate and maintain that open data.

Pathways to access – By adopting a situated practice approach, I am keen to understand how it is older adults access the different services. What do they seek out and how do they do it? Currently we have worked on this in relation to social connectedness services and have developed the idea of pathways to access. Building strategies and information technologies that open up pathways to access for all is crucial.

The so-called **digital divide** – This is central to my interests. I have done a lot of work in the information technology and international development field for some time. I am interested in how technology might be used to ensure that services are available to all. I am cautious of projects that focus on the deficits of older adults. While things like training etc have a role, we need to think more broadly to understand how information technology-based services may benefit everyone, how they might make services more accessible, and how they may remain accessible to older adults all throughout their later years. We thus need to design for different forms of access: absent, intermediate and full.

Joining-up of the third sector. I would be interested to look at the opportunities and challenges pertaining to joining up the provision of services provided by the third sector for older adults. This would build on work I have done in the public sector. Experience suggests that even within NGO organisations there is considerable politics that gets in the way of providing support to older adults.

Professor Carol Holland**Professor in Ageing and Director of C4AR**

Carol is a Professor in Ageing within the Division of Health Research, and co-director of C4AR. She is a psychologist with a career focusing on applied impacts of cognitive and health psychology of ageing, for example, impacts of functional memory on ability to engage socially and on loneliness, or impacts of changes in attention and of self-regulation on later life driving and pedestrian safety. She works across disciplines and sectors, bringing together a range of expertise in projects addressing challenges of ageing. She is a co-ordinator within the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA), working in the A3 Action group on Prevention of Frailty and Cognitive Decline and leads partnerships with a range of international collaborators.

Research Overview and Interests

Carol has several ongoing or recently completed projects focussing on frailty, including cognitive and psychological frailty, for example, the EU 3rd Health Programme funded project FOCUS, of which Carol was UK PI. FOCUS stands for Frailty Management Optimisation through EIPAHAs Commitments and Utilisation of Stakeholders' Input <http://focus-aha.eu/>. This project aims to critically reduce the impact of frailty in Europe by developing methodologies and tools to assist entities focusing on early diagnosis, screening and management of frailty, and finished in 2018. Frailty is a common clinical syndrome in older adults that brings an increased risk for poor health outcomes including falls, poor quality of life, dependence, hospitalisation and mortality. Our systematic review and realist review work has demonstrated that frailty can be addressed even in the very old with significant frailty, and our qualitative work with a range of stakeholders has shown the roles of psychological resilience, lifestyle health behaviour and social support in preventing the worst outcomes.

In a project that has become well-known in the housing and health field, working with the ExtraCare Charitable Trust, Carol examined the longitudinal impact of moving to retirement villages and schemes with an active ageing and supported well-being strategy on outcome cognition, psychological health, physical health and care needs and costs <http://www.aston.ac.uk/lhs/research/centres-facilities/archa/extracare-project/>. As an outcome of that, she worked on a Knowledge Transfer Partnership (KTP) to further develop and implement the measures of frailty used, which incorporate cognition and psychological wellbeing as well as physical aspects.

Leading from both projects, Carol is now developing a range of measures to more holistically assess frailty and resilience in community samples of older people, including assessments of perceptions of the age friendliness of environments.

In a new project, Carol is overseeing the evaluation of the Together an Active Future programme of work to increase physical activity in the Pennine Lancashire region, in partnership with Blackburn-with-Darwen Council and funded by Sport England.

Some Recent Papers

Garner I, **Holland C.** (2019) Age friendliness of living environments from the older person's viewpoint: development of the age-friendly environment assessment tool, *Age and Ageing* <https://doi.org/10.1093/ageing/afz146> ([Link to full text](#)).

Sezgin D., ... **Holland C.**, ... O'Caoimh, R (2019) Early Identification of Frailty: Developing an International Delphi Consensus for a Definition of Pre-frailty. *Age and Ageing*, 48, (S3) 17–iii65, <https://doi.org/10.1093/ageing/afz103.168>

Gwyther H, van Velsen L, Shaw RL, ... **Holland C.** (2019) The use of technology in the context of frailty screening and management interventions: a study of stakeholders' perspectives *BMC medical informatics and decision making* 19 (1), 110 <https://doi.org/10.1186/s12911-019-0828-6>

M Marcucci, S Damanti, F Germini, J Apostolo, E Bobrowicz-Campos, Gwyther H, **Holland C.**, Kurpas D, Bujnowska-Fedak M, Szwamel K, Santana S, Nobili A, D'Avanzo B, Cano A. (2019), Interventions to prevent, delay or reverse frailty in older people: a journey towards clinical guidelines. *BMC Medicine* 17 (1), 193

Kurpas D, Gwyther H, Szwamel K, Shaw RL, D'Avanzo B, **Holland C.**, Bujnowska-Fedak, MM (2018) Patient-centred access to health care: a framework analysis of the care interface for frail older adults. *BMC Geriatrics* 18:273 <https://doi.org/10.1186/s12877-018-0960-7>

Gwyther, H., Bobrowicz-Campos, E, Apóstolo, J, Marcucci, M, Cano A, **Holland, C.** (2018) [A Realist Review to Understand the Efficacy and Outcomes of Interventions Designed to Minimise, Reverse or Prevent the Progression of Frailty](#). *Health Psychology Review*, 1-48 <https://doi.org/10.1080/17437199.2018.1488601>

Leahy, F., Ridout, N., **Holland, C.** (2018) Memory flexibility training for autobiographical memory as an intervention for maintaining social and mental well-being in older adults *Memory*, 26 (9), 1310-1322. <https://doi.org/10.1080/09658211.2018.1464582>

Professor Joanne Knight
Chair in Applied Data Science

Keywords: Genetics, brain imaging, Neurology, Hypertension, Data Science

The work I do in ageing largely focuses around complex diseases that have a later age of onset. For example I have worked with neurodegenerative diseases such as Alzheimer's and Parkinson's disease. I have also worked on hypertension. The main aim of my work is to identify gene variants that could be risk factors for such diseases. I also develop methods to integrate genetic data with other types of data.

Recent papers relating to aging include:

- Evangelos Evangelou et al. "Genetic analysis of over one million people identifies 535 novel loci for blood pressure." *Nature Genetics*. 2018 Oct;50(10):1412-1425. doi: 10.1038/s41588-018-0205-x. Epub 2018 Sep 17.
- Saeed et al "APOE-ε4 associates with hippocampal volume, learning, and memory across the spectrum of Alzheimer's disease and dementia with Lewy bodies." *Alzheimer's & Dementia*. 2018 May 18. pii: S1552-5260(18)30127-4.
- Patel et al. "Heritability estimates of cortical anatomy: the influence and reliability of different estimation strategies." *Neuroimage*. 2018 May 6;178:78-91.
- Wain et. al. "Novel blood pressure locus and gene discovery using GWAS and expression datasets from blood and the kidney." *Hypertension*. *Hypertension*. 2017 Jul 24. pii: HYPERTENSIONAHA.117.09438. doi: 10.1161/HYPERTENSIONAHA.117.09438. [Epub ahead of print] ****Hypertension Top paper for 2017 in the category of basic science.**
- Patel S, et al. Heritability of hippocampal subfield volumes using a twin and non-twin siblings design. *Hum Brain Mapp*. **(Joint senior author)**. 2017 May 31. doi: 10.1002/hbm.23654. [Epub ahead of print] PubMed PMID: 28561418.
- Felsky D et al. Genetic epistasis regulates amyloid deposition in resilient aging. *Alzheimers Dement*. 2017 Mar 17. pii: S1552-5260(17)30088-2. doi: 10.1016/j.jalz.2017.01.027. [Epub ahead of print] PubMed PMID: 28322202.
- Warren HR et al. Genome-wide association analysis identifies novel blood pressure loci and offers biological insights into cardiovascular risk. (2017) *Nat Genet*. Mar;49(3):403-415.

Grant funding in this area:

- Co-App **Alzheimer's Association (US) and Brain Canada**, Walter Swardfager (PI). "Neuroinflammatory susceptibility to vascular disease as a dementia driver" \$150,000 awarded over 2017-2020.
- Co-Applicant, **Canadian Institute of Health Research (CIHR)**, Sandra Black & Mario Masellis (PIs). "Cohort to illuminate Neurodegeneration, Genetics, Imaging Associations and Leukoaraiosis" \$218,207 awarded over 2015-2019.
- Co-Applicant, **CIHR**, Mallar Chakravarty & Jens Pruessner (PIs). "Imaging-genetics biomarkers for disease risk in Alzheimer's Disease." \$449,447 awarded over 2015-2019.
- Co-Applicant, **CIHR**, Mario Masellis (PI). "Genetic Frontotemporal Dementia Initiative (GENFI) in Canada." \$932,818 awarded over 2014-2019.
- **APOE-ε4, white matter hyperintensities, and cognition in Alzheimer and Lewy body dementia.** / Saeed Mirza, Saira; Saeed, Usman; **Knights, Jo**; Ramirez, Joel; Stuss, Donald; Keith, Julia; Nestor, Sean M.; Yu, Di; Swardfager, Walter; Rogaeva, Ekaterina; George-Hyslop, Peter St.; Black, Sandra E.; Masellis, Mario.
- In: *Neurology*, Vol. 93, No. 19, 05.11.2019, p. e1807-e1819

Dr Robert Lauder, Senior Lecturer, Division of Biomedical Life Sciences

Understanding Osteoarthritis to develop better treatments

Introduction

Osteoarthritis is a common condition in old age, causing chronic pain and reducing people's quality of life. Its incidence is increasing, and it brings a wider socio-economic burden through reduction in mobility and increased healthcare costs.

Two parts of the body integrally involved with the development of osteoarthritis are the meniscus and articular cartilage. The **meniscus** is the largest tissue of the knee joint, and is often referred to as the cartilage of the knee joint. All of our tissues undergo constant maintenance to remove older and poorly functioning molecules, and replace these with new. This means that the components of the meniscus contribute significantly to the composition of synovial fluid, which reduces friction between the articular cartilage of synovial joints during movement.

Articular cartilage is the smooth, white tissue that covers the ends of bones where they come together to form joints. Healthy cartilage in our joints makes it easier to move, allowing the bones to glide over each other with very little friction.

Damage to the meniscus can be caused by traumatic injuries, or by degeneration. Degeneration of the meniscus is common, and – unlike traumatic damage – is very strongly correlated with the development of osteoarthritis up to 15-20 years later; it may indeed be an inevitable outcome of aging. A degenerative meniscal tear may be the first indication of widespread OA within the joint.

Understanding age-related meniscal degeneration is central to diagnosing, delaying and preventing osteoarthritis and so enhancing quality of life for our ageing population.

Lancaster research into age-related changes in meniscal macromolecules

Research in the Lauder Lab seeks to understand the structure and function of molecules in the connective tissue called glycosaminoglycans (GAGs) and the proteoglycans (PGs) to which they are attached. These are involved in many developmental processes which makes them important potential targets for therapy. Changes in their structure (whether normal age-related changes, or abnormal pathology-related changes) can be used as markers of damage and of disease long before any clinical symptoms are evident. Indeed, it's clear that molecular changes are taking place 15 – 20 years before any clinical symptoms are seen.

Our data show that that meniscal and articular GAGs differ, confirming that we must assess their function independently. Our data also show age- and damage-related changes in meniscal GAGs; for example the abundance and detailed structure of the major GAG Chondroitin sulphate changes normally as we age. However, we find that following damage and disease some specific parts of these molecules return to a structure normally found in a much younger person.

These changes are an attempt by the tissue to bring about repair. We know this because features common in young people, and following damage, promote tissue development and repair.

Present and future work

Our goal in understanding these changes is to:

1. Use them as biomarkers of molecular changes in the tissues, so that osteoarthritis can be diagnosed ahead of the appearance of clinical symptoms
2. Use them as targets for therapy – by promoting features which are involved in tissue repair and development thus the devastating effects of OA may be delayed or reversed.

Professor Corinne May-Chahal
Faculty of Arts and Social Sciences, Sociology

My research interests in ageing primarily relate to safeguarding older people from abuse and neglect including self-neglect.

Recent studies on self-neglect highlight the crucial role that community members play, not just as referrers to services, but as definers of what is and is not to be tolerated in their neighbourhood. In the context of social care policy development that promotes the role of local communities in social care and positions self-neglect as a safeguarding concern, my research has addressed a gap in the evidence base—that of improving understanding of public perceptions of self-neglect. In one published study (May-Chahal and Antrobus, 2012) members of the public were recruited from a local further education college and a voluntary agency that involved older people as volunteers. Thirty-four people (thirty-two females and two males) took part in eight focus groups drawing on a visual and textual vignette. Overlapping themes emerging from the analysis of discussion included strong emotional reactions to the situation participants were presented with, real concerns about hygiene, disease and contamination, actions in relation to choice (should older people have the option to live as they choose, whatever the consequences for themselves), the impact on the neighbourhood (including lowering house prices and dwellings deteriorate) and expectations of formal intervention. The study found evidence of highly negative and abusive standpoints, particularly amongst younger participants that foregrounded questions of risk of physical and emotional abuse by community members. We proposed the development of a model for community intervention based on four principles: working with community members to achieve agreement on the lowest living standards they feel able to accept, co-ordinating community resources to agree a response if these standards are breached, facilitating positive contact between community members and older people who may be considered self-neglecting and community monitoring to identify resource gaps.

As associate director for Security Lancaster I encourage the development of projects that focus on security in later life. Older people may be subject to community, interpersonal and sexual violence, but there are further dimensions that connect with security (safe living in smart homes, financial security (and abuse), food, environmental and data security). I have introduced the notion of 'cyborg safeguarding' (May-Chahal et al, 2012) to encourage practitioners in health and social care to consider service users as living in a digital world. Initially, this was applied to safeguarding children but very similar principles apply to adults where ubiquitous computing, the internet of things, and enhanced access to digital images through mobile devices also impact on everyday life (whether or not people are aware of it).

I have also conducted research into vulnerability to gambling harm. This has relevance to older people in at least two ways. Firstly, concerns about increased gambling activity by older people as a means of combatting social isolation and secondly, links have been made to increased vulnerability for people with Parkinson's disease using certain medications. Both may lead to serious problems if excessive funds are lost as older people have less opportunity to reclaim financial security.

References

May-Chahal, C. & Antrobus, R., 2012, Engaging community support in safeguarding adults from self-neglect, *British Journal of Social Work*, Vol. 42, No. 8, 2012, p. 1478-1494.

May-Chahal, C., Mason, C., Rashid, A., Walkerdine, J., Rayson, P., Greenwood, P. (2014). Safeguarding Cyborg Childhoods: Incorporating the On/Offline Behaviour of Children into Everyday Social Work Practices, *British Journal of Social Work*, 44 (3): 596-614.

Professor Christine Milligan,
Centre for Ageing Research, Faculty of Health and Medicine

Summary of Key Research Areas

In sum, my main areas of research focus on: i) health technology for supporting and promoting increased self-care and activation of older people with long-term conditions living at home; ii) preventative community & activity interventions to support active ageing and alleviate social isolation (including older people with dementia); and iii) the health and wellbeing impacts of informal (family) care-giving for older people living at home.

Current Research Programme:

I am currently engaged in the following research:

- **Lancashire Care Innovation Alliance Testbed (LCIA)**

Over 2.5 years the LCIA are implementing and evaluating a combination of innovative technologies and practices aimed at *supporting frail elderly people to remain well in the community*. The clinical challenge is to reduce hospital admissions, create capacity, reduce overall costs, minimize other health and social care usage and maximize patient activation and outcomes for a targeted population of older people (defined as those aged 55+) who suffer from multiple morbidities including dementia. These issues present a major challenge for the area given its dispersed population and urgently need innovative solutions. The study involves two NHS Vanguard sites in the Northwest, industry – including a wide range of health technology innovators led by Philips, as well as local government and the third sector. The Test Bed is now in phase 1.5 which involves adoption and spread of the programme.

In previous EU research I have worked with colleagues in Sociology and a range of EU countries to develop ethical frameworks for the implementation of telecare with older people (EFORTT).

- **Preventative interventions designed to support active ageing and to alleviate social isolation**

This second strand of work is evident in three current pieces of research:

- I. **A life More Ordinary:** (ALMO) working in partnership with the Dukes Theatre, Lancaster and Age UK on a programme designed to develop dementia friendly spaces in which older people with dementia and their family members can engage together in everyday arts-based social activities beyond the home. Linked to this, I have two PhD students whose work is looking at i) how people with dementia understand and experience dementia friendly spaces; and ii) the role of performative arts in supporting people with a diagnosis of dementia.
 - II. **REACH:** an evaluation of a three-year project run by Age UK Carlisle and Eden. This is designed to improve the lives of lonely and socially isolated older people living in deprived rural and remote areas in the Northwest, through the provision of its 'Three 'Fs' programme (fitness, finance and friendships) programme
 - III. **Examining the evidence base for multi-modal non-pharmacological interventions** for improving the lives of people living with dementia. With no new pharmacological breakthroughs on the horizon, this project is looking at the evidence for improved health and wellbeing for people with dementia through non-pharmacological approaches.
- **The health and wellbeing impacts of family care-giving** and how this relates to their experience of home and community.
 - My most recent work in this area has looked at understanding the needs and experiences of older male care-givers caring for ageing family members. With an ageing population, the numbers of older male carers (65+) is growing and now exceeds that of older women carers. These older male carers are also likely to undertake more hours of care-giving than their female counterparts. This study worked with older male carers and care providers to understand how older male carers cope with and experience care-giving, the forms of support they draw upon, and how this impacts on their sense of self and wellbeing. We also examined how (or if) gender played a part in shaping the forms of formal care support extended to male carers.

Professor Padraic Monaghan
Faculty of Science and Technology, Psychology

My work investigates language learning and literacy development, but investigate reading ability throughout the lifespan. So, we are interested in how very early language experience affects later language processing. We use computational models of reading to investigate how different representations are processed during mapping from written to spoken and meaning forms of words. We investigate how aging affects the reading system, and how age-related disorders, such as Alzheimers and dementia affect reading behaviour.

Hazel Morbey, PhD, Research Fellow, Division of Health Research

Hazel has a professional background in registered mental health nursing and social work. She has worked in the area of later life research since 1994 contributing to a number of academic research studies many of which reflect her interests in inclusive and participatory approaches to research in the areas of older frailty and vulnerability, including: elder abuse, older homelessness, older family carers, end of life, care home residents, and dementia.

Brief summary of current area of work: Neighbourhoods & Dementia Programme (N&D) (PI Dr S Reilly)

The Improving Dementia Care Lancaster University research team are currently conducting two studies within the [Neighbourhoods and Dementia Programme](#) (2014-2019) funded by the NIHR/ESRC

Developing a core outcome set for people with dementia living at home in their neighbourhoods and communities (COS) The key aim of this study is to develop a core outcome set to establish an agreed standardised set of outcomes that should be included and measured when evaluating non-pharmaceutical interventions. Initial work has included a literature review and qualitative data collection through interviews and focus groups to identify what outcomes are most important to people with dementia living at home from their own perspective, and from the perspective of their care partners and other stakeholders. Extensive consultation has involved developing accessible language descriptions for outcomes with people living with dementia and care partners. A Delphi survey and consensus approach will establish outcomes of most importance. This will be followed by a systematic literature review and stated preference survey to determine measures for the identified outcomes.

Developing the evidence base for evaluating dementia training in NHS hospitals (DEMTRAIN) This *Developing the evidence base for evaluating dementia training in NHS hospitals (DEMTRAIN)* This study will develop the evidence base for dementia training in NHS hospitals. Viewing the acute hospital as a neighbourhood space increasingly occupied by people with dementia, the research examines the quality and effectiveness of training programmes in acute hospital settings. We are also examining the impact of dementia training on staff skills, knowledge, confidence and satisfaction, and improved outcomes for dementia patients. Case study work will explore barriers and facilitators to implementation, and sustainability of training in dementia care in hospitals. Recommendations from this work will promote dementia training design that impacts on improved patient outcomes and which support the care delivery experiences of staff working with people with dementia in NHS and other care settings.

Recent publications

- Harding A.J.E, Morbey H, Ahmed A, Opdebeeck C, Wang Y.Y, Williamson P, Swarbrick C, Leroi I, Challis D, Davies L, Reeves D, Holland F, Hann M, Hellström I, Hydén L.C. Burns A, Keady J, Reilly S. Developing a core outcome set for people living with dementia at home in their neighbourhoods and communities: study protocol for use in the evaluation of non-pharmacological community based health and social care interventions. *Trials* 2018; 19(1): 247-13.
- Victor, C., Davies, S., Dickenson, A., Morbey, H., Masey, H., Gage, H., Froggatt, K.A., Iliffe, S., Goodman, C. 'It just happens'. Care home residents' experiences and expectations of accessing GP care: a qualitative study *Archives of Gerontology and Geriatrics* 3/08/2018.
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- Wilson E, Morbey H, Brown J, Payne S, Seale C, & Seymour J (2015) 'Administering anticipatory medications in end of life care: A qualitative study of nursing practice in the community and in nursing homes.' *Palliative Medicine* 29:1 60–70.
- Milligan, C & Morbey, H (2014) 'Hidden male carers find it harder to reach out.' *The Conversation* 29th January <https://theconversation.com/hidden-male-carers-find-it-harder-to-reach-out-22447> (last accessed 12th August 2015).

Maggie Mort**Professor of the Sociology of Science, Technology and Medicine**

She works primarily with participative ethnographic approaches in examining the response to perceived 'crises' in health and social care (such as the introduction of telecare for older people) and in the response to disasters, both from citizen and policy perspectives. She was Coordinator of the EC FP7 Science in Society project, EFORTT: Ethical Frameworks for Telecare Technologies for older people in Europe. She has published widely on human machine relations in health and medicine, including:

Example Publications

Mort M et al (2015), 'Ethical implications of home telecare for older people: a framework derived from a multi-sited participative study' *Health Expectations*, vol 18, 3, 438-449., 10.1111/hex.12109;

Mort, M, Roberts, C & Callen, B (2013), 'Ageing with telecare: care or coercion in austerity?' *Sociology of Health and Illness*, vol 35, 6, 799-812., 10.1111/j.1467-9566.2012.01530.x;

Roberts, C, Mort, M & Milligan, C (2012), 'Calling for Care: 'Disembodied' Work, Teleoperators and Older People Living at Home' *Sociology*, vol 46, 3, 490-506., 10.1177/0038038511422551

Professor Sheila Payne BA(Hons), RN, Dip.N, PhD, C.Psychol
Emeritus Professor in Palliative Care, International Observatory on End of Life Care

Professor Sheila Payne is a health psychologist with a background in nursing. She holds an Emeritus Chair at the International Observatory on End of Life Care at Lancaster University. She is a Visiting Professor at the University of Ulster, Northern Ireland, and Zurich University of Applied Sciences, Switzerland. During her career, she established and led three research groups; the Health Research Group at the University of Southampton (1996-2000), the Palliative and End of Life Care Research Group, University of Sheffield (2003-2006) and she was Director of the International Observatory on End of Life Care, Lancaster University (2009-2014). She was President of the European Association of Palliative Care (2011-2015) and received the EAPC Award for international leadership in palliative care in 2017. She has worked closely with the World Health Organisation as a temporary advisor for the Eastern Mediterranean Region (EMR), participating as a speaker on palliative care in the Expert Consultation to Scale up Cancer Care in the EMR, in Cairo, Egypt, 27-28 November 2016, producing an agreed EMR cancer strategy, and teaching national leaders on a 'train-the-trainer' international EMR programme in Kuwait in 2015. She was the senior author on a recent paper: Fadhil I, Lyons G, Payne S. Barriers to, and opportunities for, palliative care development in the Eastern Mediterranean Region. *Lancet Oncology* 2017 18, 3, p. e176-e184 9 p. In spring 2017, she contributed to the drafting and high level workshop consultations on the first national Palliative and End of Life Care Strategy for Jordan. She led the preparation of a chapter on Palliative Care to the *WHO Manual on Medical Devices in Cancer* published 2017. She was a member of the WHO *ad hoc* Technical Working Group on the implementation of the World Health Assembly resolution, and led the writing of a chapter on Psychosocial Aspects of Palliative Care in a book called *Building Integrated Palliative Care Programs and Services* published in 2017. She is a Salzburg Global Health Fellow and has contributed to the outcomes of 'Rethinking care towards the end of life' seminar in December 2016, which she and a team have been following up in 2017 with a year-long social media campaign highlighting nine important global questions to increase palliative care awareness.

Professor Payne has a long track record in palliative care research and scholarship. Her research focuses on palliative and end-of-life care for older people. She currently holds two European Commission Framework 7 programme funded major international grants and has supervised over 35 PhD students. She has published over 489 papers in academic and professional journals and published 13 books, with another book in press.

Professor Chris Plack
Department of Psychology

As we age, hearing ability declines, and most people over the age of 60 experience some difficulties with their hearing. For many people this can result in social isolation and a substantial reduction in quality of life. Hearing loss is associated with dementia, although a causative association has not yet been established.

I have broad interests in the physiology and psychology of normal and impaired hearing. Most recently, I have been investigating neural hearing deficits that are not detectable by standard clinical tests, but which may nevertheless impact on real-world listening ability. Two recent projects examining ageing effects are described below.

The effects of age on the perception of musical harmony

Harmony is one of the main components of Western music. My former PhD student Dr. Olly Bones and I have shown that the perception of harmony is related to the ability of neurons in the brain to synchronise their firing patterns to the sound waveform. We also showed, for the first time, that the perception of harmony deteriorates with age and that this is associated with a loss of neural synchronisation. These effects are seen even when the clinical audiogram is normal, suggesting that neural deficits can have a large effect on hearing even for people who would be regarded as having normal hearing by an audiologist.

The effects of age on temporal coding in the auditory system

I lead an ongoing research project with Dr. Sam Carcagno in which we are determining the effects of age on auditory neural function. The focus of this project is on how neurons in the auditory system code the rapid fluctuations in sounds over time, how this coding deteriorates with lifetime noise exposure and ageing, and how this impacts on the perception of speech and music.

Selected publications

Bones, O., and Plack C.J. (2015). "Losing the music: Aging affects the perception and subcortical neural representation of musical harmony," *J. Neurosci.* 35, 4071-4080.

King, A., Hopkins, K., and Plack, C.J. (2014). "The effects of age and hearing loss on interaural phase difference discrimination," *J. Acoust. Soc. Am.* 135, 342-351.

Plack, C.J., Barker, D., and Prendergast, G. (2014). "Perceptual consequences of 'hidden' hearing loss," *Trends Hear.* 18, 1-11.

Marmel, F., Linley, D., Carlyon, R.P., Gockel, H.E., Hopkins, K., and Plack, C.J. (2013). "Subcortical neural synchrony and absolute thresholds predict frequency discrimination independently," *J. Ass. Res. Otolaryngol.* 14, 757-766.

Dr Paul Rayson
Director of UCREL and Reader in Natural Language Processing
School of Computing and Communications

I am director of the UCREL research centre and a Reader in the School of Computing and Communications, in the Infolab21 building at Lancaster University in Lancaster, UK. A long term focus of my work is the application of semantic-based NLP in extreme circumstances where language is noisy e.g. in historical, learner, speech, email, txt and other CMC varieties. My applied research is in the areas of dementia detection, online child protection, cyber security, learner dictionaries, and text mining of historical corpora and annual financial reports. I am a co-investigator of the five-year ESRC Centre for Corpus Approaches to Social Science (CASS) which is designed to bring the corpus approach to bear on a range of social sciences. I'm also a member of the multidisciplinary centre Security Lancaster, and Lancaster Digital Humanities, and the Data Science Institute.

Relevant projects:

Metaphor in end-of-life care (MELC) <http://ucrel.lancs.ac.uk/melc/>

SAMS (Software Architecture for Mental health Self management) <http://ucrel.lancs.ac.uk/sams/>

Relevant papers:

Semino, E., Demjen, Z., Demmen, J., Koller, V., Payne, S., Hardie, A., & Rayson, P. (2017). The online use of Violence and Journey metaphors by patients with cancer, as compared with health professionals: a mixed methods study. *BMJ Supportive and Palliative Care*, 7(1), 60-66. DOI: 10.1136/bmjspcare-2014-000785

Demmen, J. E., Semino, E., Demjen, Z., Koller, V., Hardie, A., Rayson, P., & Payne, S. (2015). A computer-assisted study of the use of violence metaphors for cancer and end of life by patients, family carers and health professionals. *International Journal of Corpus Linguistics*, 20(2), 205-231. DOI: 10.1075/ijcl.20.2.03dem

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Bull, C. N., Asfiandy, D., Gledson, A., Mellor, J., Couth, S., Stringer, G., ... Sawyer, P. H. (2016). Combining data mining and text mining for detection of early stage dementia: the SAMS framework. In *Resources and Processing of linguistic and extra-linguistic Data from people with various forms of cognitive/psychiatric impairments (RaPID '16) workshop: Proceedings of the 10th International Conference on Language Resources and Evaluation (LREC '16)*. (pp. 35-40). European Language Resources Association (ELRA).

Sawyer, P., Sutcliffe, A., Rayson, P., & Bull, C. (2015). Dementia and social sustainability: challenges for software engineering. In *Software Engineering (ICSE), 2015 IEEE/ACM 37th IEEE International Conference on (Volume:2)*. (pp. 527-530). IEEE. DOI: 10.1109/ICSE.2015.188

Sutcliffe, A., Rayson, P., Bull, C., & Sawyer, P. (2014). Discovering affect-laden requirements to achieve system acceptance. In *22nd IEEE International Requirements Engineering Conference (RE'14)*. (pp. 173-182). IEEE. DOI: 10.1109/RE.2014.6912259

Siobhan Reilly, PhD
Senior Lecturer, Division of Health Research

Siobhan is the principal investigator on the two **Neighbourhoods and Dementia Programme (N&D)** studies described below. She is also the Associate Director of the Cumbria and Lancashire Local Team, National Institute for Health Research's Research Design Service North West. Her background is in health services research. One of her principal research interests is around improving the evidence base for the delivery of health and social care services for people living with dementia. Her work includes the policy, practice, organisation and delivery of health and social care services, particularly in relation to the integration and coordination of health and social care services. She has experience of conducting Cochrane systematic reviews of complex interventions, notes extraction from primary care and a longitudinal epidemiological primary care database study and has conducted many surveys and evaluations over her research career. Prior to joining the Division of Health Research in September 2013, she worked as a health service researcher in a range of settings since 1993 funded by the Department of Health or the NIHR, including a NIHR School for Primary Care training fellowship (2010-13). Siobhan leads two studies within the [Neighbourhoods and Dementia Programme](#) (chief investigator, Professor John Keady based at Manchester University).

The Improving Dementia Care Lancaster University research team are currently conducting two studies within the [Neighbourhoods and Dementia Programme](#) (2014-2019) funded by the NIHR/ESRC

Developing a core outcome set for people with dementia living at home in their neighbourhoods and communities (COS) The key aim of this study is to develop a core outcome set to establish an agreed standardised set of outcomes that should be included and measured when evaluating non-pharmaceutical interventions.

Developing the evidence base for evaluating dementia training in NHS hospitals (DEMTRAIN) This study will develop the evidence base for dementia training in NHS hospitals. Viewing the acute hospital as a neighbourhood space increasingly occupied by people with dementia, the research examines the quality and effectiveness of training programmes in acute hospital settings and their impact on length of hospital stay, emergency readmissions and mortality for people with dementia.

Harding A, Morbey H, Ahmed F, Opdebeek C, Wang YY, Williamson P, Swarbrick C, Leroi I, Challis D, Davies L, Reeves D, Holland F, Hellström I, Lars-Christer Hydén, Burns A, Keady J, Reilly S. Developing a core outcome set for people living with dementia at home in their neighbourhoods and communities: study protocol for use in the evaluation of nonpharmacological community based health and social care interventions. (Submitted to Trials).

Bosu WK, Aheto JMK, Zucchelli E, Reilly S. Prevalence, awareness, and associated risk factors of hypertension in older adults in Africa: a systematic review and meta-analysis protocol. Systematic reviews. 2017 Oct 4;6(1). 192. Available from, DOI: 10.1186/s13643-017-0585-5

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Harding A, Opdebeek C, Morbey H, Ahmed F, Williamson P, Leroi I, Keady, Reilly S. A Neighbourhoods and Dementia Study: What is Important to People with Dementia Versus Trial Outcomes. The 21st IAGG World Congress of Gerontology and Geriatrics (IAGG) San Francisco, California, July 2017. (*conference abstract*)

Ahmed F, Morbey H, Holland F, Hann M, Davies L, Keady J, Leroi I, Swarbrick C, Reeves D, Reilly S. (2017) Developing a programme theory for dementia training in hospitals: Why we need a critical interpretive synthesis review of current evidence-base. Health Service Research UK Symposium Nottingham July 2017. (*conference abstract*)

Riste L, Sanders C, Reilly S, Coventry P & Bower P. An Integrated Care Programme (ICP): what are the barriers to reducing hospital admissions? Health Service Research UK Symposium Nottingham July 2017. (*conference abstract*)

Harding A, Morbey H, Ahmed F, Williamson P, Swarbrick C, Leroi I, Keady J, Challis D, Reeves D, Davies L, Hellström I, Christer Hydén L and Reilly S. (2017) Developing a core outcome set for people with dementia living at home in their neighbourhoods and communities. British Society of Gerontology 46th Annual Conference, University of Swansea. Oral presentation. July 2017 (*conference abstract*)

Professor Paul A. Rodgers
Imagination, Lancaster University

Paul Rodgers is Professor of Design in Imagination, Lancaster University. Prior to joining Imagination at Lancaster University in April 2016, he was Professor of Design Issues at Northumbria University, School of Design. Before that he was Reader in Design at Edinburgh Napier University between 1999 and 2009 and a post-doctoral Research Fellow at the University of Cambridge's Engineering Design Centre between 1996 and 1999. He also worked at the University of Wolverhampton as a senior lecturer in Product Design between 1995 and 1996. He holds undergraduate and postgraduate degrees in Design (both from Middlesex University), and a PhD in Product Design Assessment (from the University of Westminster). His PhD external examiner was the late Professor Bruce Archer of the Royal College of Art, London.

Professor Rodgers has recently been appointed the Arts and Humanities Research Council (AHRC) Leadership Fellow for Design. He will take up this prestigious position from January 2017 for 3 years. In this role Professor Rodgers aims to develop the Design research area to be inclusive in its scope and encourage projects that adopt and utilize an *mélange* of different types of design research including experimental, practice-based, and hybrid approaches and methods. Also, in my Design Leadership role I wish to see a transformational shift in the focus, quality and impact of design research that will leave a legacy of evidence and examples, and a bolder, stronger interdisciplinary design community with a new generation of early career researchers engaging with a "Design for Change" agenda.

Professor Paul Rodgers has over 20 years' experience in design research, working with a range of commercial, public and third sector organizations such as BAE Systems, NCR, National Museums Scotland, Newcastle YMCA, Greggs the Bakers, Traidcraft, and Alzheimer Scotland. He has led several research projects for EPSRC, the AHRC, the Scottish Government and The Lighthouse (Scotland's National Centre for Architecture, Design, and the City. He has recently completed a Design Research Fellowship with Alzheimer Scotland (funded by the Arts and Humanities Research Council).

His current research interests include design disruption activities, hybrid creative practice, exploratory and experimental design research methodologies, and design for the third sector and public engagement. He is the author of 9 books on design including the recently published *The Routledge Companion to Design Research* for Routledge/Taylor & Francis Publishers, London. He is a founding member of the Design Disruption Group [<http://designdisruptiongroup.wordpress.com/>] where he explores the discipline of design and how disruptive design interventions can enact positive change in health and social care and elsewhere. The Design Disruption Group collaborate regularly with a range of commercial, public and third sector organizations such as Newcastle YMCA, Greggs the Bakers, Newcastle Carers, Traidcraft, and Alzheimer Scotland.

His recently completed AHRC-funded Design Research Fellowship with Alzheimer Scotland explored how design thought and action can contribute to showing how people living with dementia have much to offer UK society after diagnosis. Professor Rodgers is also the lead investigator on two AHRC-funded Collaborative Doctoral Awards (one with Newcastle Carers and one with Alzheimer Scotland) where the main objective is to identify the major day-to-day consequences of caring for people through the use of disruptive design techniques and approaches. Recently, he was co-investigator on a £2.5 million EPSRC funded project entitled "TRUMP" that explored how trust can be embedded in designed solutions for urban and rural mobile healthcare contexts.

Professor Rodgers has led several recent projects including "We are all Designers" (funded by the AHRC in conjunction with the Royal College of Art), "Cultures of Creativity and Innovation" (funded by the AHRC in conjunction with the Indian Institute of Science, Bangalore and Sapienza University, Rome) and "Design School: The Future of the Project" (funded by the AHRC in conjunction with the Design Museum, London and Charles Sturt University, Australia).

Professor Rodgers has published 9 books and more than 150 papers in book chapters, journals and conferences

Dr Mark Rouncefield

Reader, Faculty of Science and Technology, Computing and Communications

Journal articles:

Wherton, J., Sugarhood, P., Procter, R., Rouncefield, M., Dewsbury, G., Hinder, S., Greenhalgh, T. Designing assisted living technologies 'in the wild': preliminary experiences with cultural probe methodology, *BMC Medical Research Methodology* 2012, 12:188, doi: oi: 10.1186/1471-2288-12-188

Ogonowski, C., Ley, B., Randall, D., Mu, M., Race, N., & Rouncefield, M. (2014, February). Designing with users for domestic environments: methods-challenges-lessons learned. In *Proceedings of the companion publication of the 17th ACM conference on Computer supported cooperative work & social computing* (pp. 335-338). ACM.

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Greenhalgh, T., Procter, R., Wherton, J., Sugarhood, P., Hinder, S., & Rouncefield, M. (2015). What is quality in assisted living technology? The ARCHIE framework for effective telehealth and telecare services. *BMC medicine*, 13(1),

Procter, R., Wherton, J., Greenhalgh, T., Sugarhood, P., Rouncefield, M. and Hinder, S., 2016. Telecare Call Centre Work and Ageing in Place. *Computer Supported Cooperative Work (CSCW)*, pp.1-27.

Conference publications:

Greenhalgh T, Procter R, Rouncefield M, Dewsbury G, Wherton J (2011). ATHENE: assistive technologies for healthy living in elders: needs assessment by ethnography. In: *Proceedings of the 2nd Digital Economy All Hands Meeting, 15-17 November 2011; Newcastle-upon-Tyne, UK*

Sugarhood P, Wherton J, Greenhalgh T, Procter R, Rouncefield M (2012). Using the Home and Life Scrapbook: supporting ethnography and co-design 'in the wild'. Workshop on *Research in the wild: understanding 'in the wild' approaches to design and development*, DIS (Designing Interactive Systems), Newcastle-Upon-Tyne, UK, June 2012

Sugarhood P, Wherton J, Greenhalgh T, Procter R, Rouncefield M, Dewsbury G (2012). Involving older adults in the co-design of assisted living technologies. Workshop on *Elderly's everyday practices as a design approach*, NordiCHI, Copenhagen, Denmark, October 2012

Wherton J, Sugarhood P, Greenhalgh T, Procter R, Hinder S, Rouncefield M, Dewsbury G (2013). Co-production of assisted living technologies with older people. Workshop on *Designing for – and with – vulnerable people*, CHI 2013, Paris, France, April 2013

Conference presentations and posters:

Ambient Assisted Living Forum, Lecce, Italy. Poster presentation, 26-28 September 2011

The International Telecare and Telehealth Conference, London, UK. Poster presentation, 14-16 November 2011

Society for Academic Primary Care meeting, London, UK. Conference presentation, 2-3 February 2012

Royal College of General Practitioners Conference, Glasgow, UK. Poster presentation, 3-6 October 2012

William Harvey Day, Barts & the London School of Medicine and Dentistry, London, UK. Poster presentation, 16 October 2012

Recent Advances in Assistive Technology & Engineering (RAatE). Conference presentation: *Telecare as an innovation: determinants of adoption, assimilation, implementation and sustainability*, 26 November 2012

Assisted Living Innovation Platform showcase event, Liverpool, UK. Poster presentation, 5-6 March 2013

Bridging the Gap: Transferring Assistive Technologies from Concept to Market (MediLink UK), Leicester, UK. Conference presentation: *Social and behavioural studies: what have these ALIP projects told us*, 27 March 2013

Aktive (Advancing Knowledge of Telecare for Independence and Vitality in later life) conference, London, UK.

Seminar presentation "Telecare: designing products and systems for older people at home", 17 May 2013

3rd Annual International Congress on Telehealth and Telecare, The King's Fund, London, UK. Conference presentation: The ATHENE project: the importance of bricolage in personalising assisted living technologies, 3 July 2013.

Professor Jane Simpson, Professor of the Psychology of Neurodegenerative Conditions, Division of Health Research

Introduction

My research relates to understanding psychological outcomes in people with adult-onset long-term health conditions, particularly neurodegenerative diseases. My research has mainly focused on people with Parkinson's disease, Huntington's disease (HD) and dementia. My interest in psychological outcomes includes the quantitative predictors of outcomes such as low mood and quality of life, qualitative research on the experience of general and specific aspects of particular diseases and the relevance of therapeutic approaches to improve well-being, including mindfulness interventions.

A psychological approach to understanding well-being and psychological distress in people with neurodegenerative conditions is a relatively new and unexplored area in many illnesses – with the exception of dementia where innovative approaches have emphasised the importance of a biopsychosocial approach. Elsewhere, explanations for psychological distress have tended to be biological (as opposed to psychological) and relate to the other neurobiological changes. Similarly therapeutic options have traditionally been around medication rather than psychological therapy

Current projects

- Evaluation of mindfulness-based therapy in people with Huntington's disease with depression. Awarded by the EHDN: the first ever therapy trial to be funded.
- Control in people with Parkinson's disease. Rolling programme of work funded by Parkinson's UK.
- Creating clinical guidance for people with neurodegenerative conditions. British Psychological Society.

Some sample references

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Dr Kate Slade
Psychology

Keywords: Neuroscience, hearing, ageing, speech perception

My research interests are in neuroscience, psychophysiology, speech perception, and the psychological and neural consequences of hearing loss. During my PhD, my research focused on understanding effort in listening, typically experienced by people with hearing loss, using psychological theories and cardiac measures to quantify listening effort. I am now a post-doctoral research associate in the Psychology Department. I'm currently working on a BBSRC funded project on age-related hearing loss and the brain, with Dr Helen Nuttall. We are interested in understanding the impact of age-related hearing loss on brain networks involved in perceiving speech. The project uses a combination of neural methods including, magnetic resonance imaging (MRI), transcranial magnetic stimulation (TMS), and electroencephalography (EEG).

Professor Aneta Stefanovska and Professor Peter V. E. McClintock, Physics

**Research on the Dynamics of Cardiovascular and Cerebral Ageing
Nonlinear & Biomedical Physics Research Group**

The NBP Group studies the age-related alterations that occur in the cardiovascular system and brain through the application of physics and nonlinear dynamics. It takes particular interest in the analysis of very low frequency oscillations in blood flow because these that can give a measure of the state of the endothelium, the inner lining of all the blood vessels.

It has long been known that the phase of breathing affects the rate at which the heart beats, and that this effect decreases as we age. The research has associated this reduction in heart-lung interaction with changes in the endothelium, the inner lining of all the blood vessels. We find –

- A decrease with age in the influence of the lungs on the heart, consistent with earlier work. It means that the cardiovascular system is gradually becoming less well able to function coherently as a single entity.
- That this change can be well-characterised and illustrated by computation of the cardio-respiratory “coupling function”.
- That there is a corresponding decrease with age in the extent to which the endothelium of blood vessels in the skin can react to a chemical stimulus. This reactivity can be taken as a useful measure of the health of the endothelium, and we were able to measure it *in-vivo*, directly and non-invasively.
- That one can thus define an individual’s “endothelial age”, which can be either less or more than their chronological age.
- That the endothelium can also be stimulated by a rise in skin temperature, resulting in greatly enhanced low frequency oscillations. Correspondingly, a decrease in skin temperature reduces endothelial activity.
- It will be feasible to create a new medical diagnostic instrument based on the endothelial response to temperature changes (patent application submitted). It will give a measure of endothelial health and will be easily useable by non-physicists.
- As an indicator of general health this “endotheliometer” has the potential to become almost as widespread in application as the clinical thermometer. We envisage their use by nurses, GPs, and other health professionals, as well as by hospital consultants. Conceivably, in the longer term given the price-reduction associated with mass-production, the endotheliometer could also be purchased by health-conscious members of the public.

The group is just completing a project in collaboration with neurologists in Ljubljana, Slovenia on subjects with Huntington’s and Alzheimer’s diseases, seeking an understanding of the interaction between cardiovascular and brain dynamics, and how it changes in dementia.

Dr Michelle Swainson**Lecturer in Physiology, Lancaster Medical School**

As an exercise physiologist, my research interests broadly relate to the role that exercise/fitness plays in the prevention and management of cardiovascular disease and associated conditions including diabetes and obesity. To date, I have focused on adults aged 30-64 years, and have an interest in contemporary risk factors that are potentially more useful and predictive of risk in this population group e.g. fitness, obesity status, inflammation and autonomic activity. I am interested in the “fitness versus fatness” debate from a disease prevention, treatment and public health perspective and am keen to develop this further, in respect to fitness and the “metabolically healthy but obese” phenotype. Obesity is a major public health concern across the lifespan and I am actively involved in methodological studies assessing various measurements of obesity, most recently assessing visceral adipose tissue (VAT) using the DXA. From an ageing perspective, I strongly feel focus on adopting active lifestyles in young to middle age is vital to reduce disease risk and enhance health benefits for older adults to live well for longer.

Current projects:

- *OPTIMISTS* – with colleagues at Lancaster University and Lancaster Royal Infirmary, we are preparing a RfPB funding application to study the effects of high intensity interval training as exercise prehabilitation for colorectal cancer patients.
- *OneLife Suffolk NHS Health Checks Project* – preparing for a BHF Programme Grant application to assess NHS health check data and the uptake of referrals into lifestyle services in adults aged 40-74 years.
- *VAT Reference Data* – currently developing reference data for DXA-derived VAT, which will inform practice across various demographics (n=2500 approx).
- *Nuffield Health Data* – ongoing work utilising data collected from preventive health assessments with focus on the associations between fitness, fatness and cardio-metabolic risk. This is based on two separate data sets, one with n=805 and the other n=11,000 (approx).
- *UK/Global Rugby Health Study* – this is the first comprehensive UK study of retired rugby players that is utilising objective measurements and I am involved in the aspects associated with cardiovascular disease risk, ECG, obesity status and physical activity levels. This study has several international collaborations.

Selected publications

- **Swainson, M.G.**, Batterham, A.M., Tsakirides, C., Rutherford, Z.H. and Hind, K. (2017) Prediction of whole-body fat percentage and visceral adipose tissue mass from five anthropometric variables. *PloSOne*. 12(5): e0177175.
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- **Mellis, M.G.**, Oldroyd, B. and Hind, K. (2014) In vivo precision of the GE Lunar iDXA for the measurement of visceral adipose tissue in adults: the influence of body mass index. *European Journal of Clinical Nutrition*, 68, pp.1365-1367.

Dr Caroline Swarbrick

Senior Lecturer in Ageing, Division of Health Research

Keywords: Dementia; participatory; co-research

Research Overview:

My research interests focus on dementia, broadly ranging the trajectory from diagnosis to end of life. With a social science background, I am driving forward a research programme working in partnership with people living with dementia and care partners to develop a collaborative research agenda using creative methods and a co-operative inquiry methodology. Our current projects focus on stigma, social isolation and urban regeneration. I am a co-investigator and Work Programme 1 lead of the ESRC/NIHR-funded Neighbourhoods and Dementia Study and joint Chief Investigator of the ESRC IAA International Collaboration Network with University of Auckland (New Zealand) and Nanyang Polytechnic (Singapore).

Selected Publications:

Longley, V., Peters, S., **Swarbrick, C.** & Bowen, A. What influences decisions about ongoing stroke rehabilitation for patients with pre-existing dementia or cognitive impairment: a qualitative study? *Clinical Rehabilitation*, 2018, doi: 10.1177/0269215518766406

Swarbrick, C. & Open Doors (2018) Developing the CO-research INvolvement and Engagement in Dementia model (COINED). In: Keady, J., Hydén, L-C., Johnson, A. & **Swarbrick, C.** 'Social Research Methods in Dementia Studies: Inclusion and Innovation'. 2017. London: Routledge. pp. 8-19

Dowlen., R., Keady, J., Milligan, C., **Swarbrick, C.**, Ponsillo, N., Geddes, L., & Riley, B. The personal benefits of musicking for people living with dementia: a thematic synthesis of the qualitative literature. *Arts and Health: an international journal*, Published online September 2017, doi: 10.1080/17533015.2017.1370718

Hassan, L., **Swarbrick, C.**, Sanders, C., Parker, A., Machin, M., Tully, M. & Ainsworth, J. Tea, talk and technology: patient and public involvement to improve connected health 'wearables' research in dementia. *Research Involvement and Engagement*, 2017, doi: 10.1186/s40900-017-0063-1

Swarbrick, C., Sampson, E. & Keady, J. Notes from the hospital bedside: Reflections on researcher roles and responsibilities at the end of life in dementia. *Quality in Ageing and Older Adults*, 2017, 18(3): 201-211, doi: 10.1108/QAOA-09-2016-0038

McWilliams, L., Farrell, C., Grande, G., Keady, J., **Swarbrick C.** & Yorke J. A systematic review of the prevalence of comorbid cancer and dementia and its implications for cancer-related care. *Ageing and Mental Health: an international journal*, Published online: 18 Jul 2017, doi: 10.1080/13607863.2017.1348476

Swarbrick, C.M., Open Doors, EDUCATE, Davis, K. and Keady, J. Visioning change: Co-producing a model of involvement and engagement in research. *Dementia: the international journal of social research and practice (Innovative Practice)*, 2016, published on-line first: doi: 10.1177/1471301216674559

Emmanuel Tsekleves**Senior Lecturer in Design Interactions, LICA**

Keywords: Design for health, wellbeing, ageing well

Emmanuel's research is driven by his life's mission to discover and share knowledge that inspires people to act on themselves and to enjoy healthier lives.

Emmanuel leads interdisciplinary international research in **design interactions for health**, which lies at the intersection of *public health*, *design for behaviour change* and *technology*. He conducts research in the design of chronic and public health interventions aimed at improving the quality of life and wellbeing of people into old age. This is well demonstrated by his recent book in **Design for Health**, by Routledge, leading the **Health and Wellbeing by Design track** at the **Design Research Society** Conference in 2018 and his **TEDx talk** in Designing our cities to be playful for health prevention.

His research aims and direction fall in the following four areas:

- A. *Public and Preventive Health*: Exploring the interactions between people, their physical and socio-cultural environment and use of technology to co-design interventions that 'design out' barriers to health promoting behaviours.
- B. *Healthy Ageing*: Using a life-course approach to health and disease and developing non-pharmacological interventions on global ageing challenges, such as dementia.
- C. *Antimicrobial Resistance*: Exploring and developing behaviour change approaches to prevent and reduce the transmission of drug-resistant infections across the built (i.e. homes, hospitals) and natural environment (i.e. agriculture).
- D. *Food and nutrition for Preventive Health*: Exploring the design of improved diet by addressing the barriers to adoption of alternative food production and exploring cultural/traditional food practices with respect to reducing the double burden of obesity and malnutrition in the Global North and Global South.

Dr Sandra Varey
Division of Health Research

Keywords: Co-management of healthcare, digital technologies, family carer wellbeing, palliative care, physical activity

Since joining the Faculty of Health and Medicine in 2013, I have undertaken research related to a number of aspects of ageing, health and wellbeing. My work has to date spanned three remits within the Faculty: the Centre for Ageing Research (C4AR), the Lancaster Medical School and the International Observatory on End of Life Care. Projects related to the C4AR have focused on:

- The use of technologies to support the self-management of long-term conditions for older people (NHS England funded Test Bed evaluation; 2016-2018)
- Improving palliative care for older prisoners (Marie Curie funded; 2015-2016)
- The benefits to older volunteers in undertaking woodland conservation work (British Academy funded; 2014)
- Social isolation and loneliness in older people (Age UK funded; 2014)
- The development of wound care technologies to support self-care for older people in the home (N8 funded; 2013-2014)

I am particularly interested in qualitative research methods and have extensive experience in the applied use of deliberative panels, ethnographic site visits, focus groups and a range of interview approaches. I have a number of years' experience of working with adults of varying ages, both as a researcher and an adult lecturer, and have a strong interest in issues of research ethics. I have worked with older adults living with a range of conditions including cancer, COPD, dementia, diabetes and heart failure, along with family carers.

To summarise, my current research interests include the following:

- The use of new technologies to address health and wellbeing in older people
- Issues of ageing and wellbeing for older people living with long-term conditions including COPD, dementia, diabetes and heart failure
- Issues of wellbeing for family carers of older people
- Loneliness and social isolation in older adults
- Patient and public involvement (PPI) in health research
- Participatory research methods in ageing research, including action research and action learning approaches

Professor Ian Walker
Professor of Economics, Lancaster Management School

Ian currently has two doctoral students undertaking research which are likely to be policy impactful as results emerge:

Emma Gorman (an ESRC phd student co-supervised with Eugeunio Zuchelli in DHR) shows that the effect of ageing on cognition is causally affected by education level when young. The findings from a regression discontinuity design show that an extra year of schooling improves working memory of the elderly by up to one-half of a standard deviation. This effect appears robust to alternative specifications and sensitivity analyses. There is only limited evidence of causal effects of schooling on measures of verbal fluency and numeric ability - but the increases in mandatory schooling led to improved performance on memory tests many decades after schooling completion. Education levels have continued to rise and the implication is that investments in education may continue to yield large payoffs as populations age.

Since education has been rising across cohorts (especially the 46 and 58 raising of the school leaving ages) this suggests that future elderly cohorts may suffer from smaller non-cognitive deficits than recent ones have. Whether this is big enough effect to keep up with ageing of successive cohorts is something we are working on; as well as looking into possible transmission mechanisms. The work uses the "Understanding Society" panel data. Further work on the ELSA cohort study is under way.

Emma spent 6 months as an ESRC funded policy intern at DWP in Whitehall to work on "life chances cohort analysis" using the Millennium Cohort Studies babies born in 2000.

Asako Ohinata (MRC post doc, now based at Leicester, co-supervised with Bruce Hollingsworth in DHR) is investigating the the supply of informal care - something that is very relevant to the Care Act implementation. The Act is based on the strong expectation that a greater supply of informal care will emerge as demand for it rises. Our work uses the 2002 Scottish reform, which introduced free formal personal care for all the Scottish elderly aged 65+, on caregiving behaviours. The results are not very encouraging - while the reduced need for informal care implied by this policy did have an impact of reducing the supply of informal care this fell well short of an equal and opposite change. The implication is that the degree of substitution between informal and formal domiciliary care is rather limited.

Professor Catherine Walshe
Division of Health Research

Keywords: Palliative care, quality of life, volunteers, community care

Research Overview

My research expertise is in palliative and end of life care. I have two main research interests: the way that palliative care is provided especially within primary and community care settings; and the experience of symptoms at the end of life. I am currently engaged in projects examining the effectiveness of social action projects on quality of life at the end of life (2014-2016), peer mentors for those with advanced cancer (2015-2018), a trial of NAMASTE care (2016-2019) an evaluation of Cottage Hospice (2016-2019), and evaluating an Age UK end-of-life care service (2017-19). I am also interested in research methods and dissemination, and edit the journal 'Palliative Medicine'.

Current Research

Current projects include:

ALTER: evaluating a novel end-of-life care service provided by Age UK (funded by Age UK) with Profs Nancy Preston and Sheila Payne.

NAMASTE CARE TRIAL: investigating the feasibility of conducting a trial of Namaste Care with people with advanced dementia in nursing care homes (funded by NIHR HTA) with Prof Katherine Froggatt (PI) and colleagues from Hertfordshire, Liverpool, Bristol.

CHECC: investigating a new model of cottage hospice care with Hospice in the Weald. with Dr Sean Hughes (PI), Dr Mary Turner and Dr Helen Barnes.

ELSA: End of Life Social Action Project; investigating the effectiveness of social action projects to influence people's quality of life (funded by the Cabinet Office) with Prof. Sheila Payne, Dr Nancy Preston, Dr Guillermo Perez Algorta, Dr Steve Dodd and Nick Ockenden and Matt Hill (Institute for Volunteering Research).

PACT: A feasibility trial of a peer mentor intervention for those with advanced cancer with Dr Diane Roberts (University of Manchester) in collaboration with Linda Appleton (Clatterbridge Centre for Oncology), Dr Lynn Calman (Southampton University), Mr Paul Large (User representative), Prof Mari Lloyd-Williams (University of Liverpool), Prof Gunn Grande (University of Manchester), Prof Suzanne Skevington (University of Manchester).

Dr Jess Wang

Lecturer, Department of Psychology

I study the cognitive basis for social interactions. Specifically, I am interested in the ways in which we succeed or fail to account for others' perspectives during communication at various stages of the lifespan. I am currently leading a project funded by the British Academy and the Leverhulme Trust, examining the interactions between age-related changes in working memory capacity and verbal ability, and their implications on perspective-taking.

Meghann Catherine Ward, BSc (Hons), MA, MRes
ESRC CASE-funded Doctoral Student, Division of Health Research

Keywords: Dementia; Participatory; Arts Activities; Wellbeing; Therapeutic Landscapes

Supervised by Professor Christine Milligan (Co-Director of Lancaster University Centre for Ageing Research), Professor Emma Rose (Lancaster Institute of Contemporary Arts) and Mary Elliott (House Manager and Creative Engagement Co-Ordinator, Theatre by the Lake, Keswick).

My ESRC-funded CASE Studentship considers the health and wellbeing benefits of engaging in participatory arts activities for people with dementia and their carers. The project is based at Theatre by the Lake's 'Setting the Scene' programme in Keswick, Cumbria, which is a multi-arts creative activity group, including storytelling and conversation, movement and dance, arts and crafts, singing and music, multi-sensory experiences and group games.

Using mixed methods - including participatory observations, interviews, photography and video data - the project aims to explore and evaluate the overall effectiveness of 'Setting the Scene' by considering:

- the importance and effectiveness of the different individual activities involved.
- how to best sustain the engagement of people with dementia in creative arts settings.
- the role and benefit of 'Setting the Scene' for family and professional carers.
- the role of additional factors including setting/space/place, group relations and materiality (objects and props used).

People living with dementia, their carers and theatre staff have all played an active role in the research project, aided by adopting a participatory action research methodology (PAR). Participant feedback contributes to both the research project findings and the gradual development and refinement of the 'Setting the Scene' programme. In addition to traditional research outcomes, the project aims to produce a 'Setting the Scene' toolkit for use by Theatre by the Lake, as well as an exhibition of research findings based at the theatre in Autumn 2020.

Fieldwork was conducted between July 2018 and August 2019. The research is underpinned by therapeutic landscapes literature (e.g. Gesler, 1993; Williams, 2007), more-than-human geographies (e.g. Whatmore, 2006) and wellbeing literature.

Dr Lara Warmelink
Lecturer, Department of Psychology

Keywords: Deception, vulnerability to scams

Research Overview

My research focuses on deception and particularly detecting lies about intentions. I study verbal non-verbal cues to deception, as well as the cognitive skills that people need to deceive and detect deception.

My research in ageing investigates to what extent people's ability to detect lies declines with age and whether this is related to cognitive decline, their own honesty and certain social factors (family support, experience with internet usage etc.). AgeUK and I are supporting Rebecca Jagodzinski, who is completing a 1 + 3 CASE studentship on the relation between older adults' cognitive decline, their social support, their ability to detect deception and their vulnerability to being defrauded.

Jess Wang and I are working on the C4AR panel. This is a database for older adults who are interested in taking part in research. If you'd like to know more about this, either as a participant or a researcher, please contact the C4AR panel directly.

Dr Qian Xiong

Lecturer in Ageing, Division of Health Research

Areas of Interest:

Demography of Ageing, Quantitative Research Methods, Life Course Analysis, Gender, and Social Stratification

Research Overview:

My academic background is Sociology and Demography, which has helped me to understand holistically the relations amongst society, population and individuals. I have experience in conducting research on fertility, migration, ethnicities, residential segregation and inequalities before moving to ageing research.

My research seeks evidence from both the developing and developed countries to inform policy changes related to population ageing and promote the well-being of older people. I have been involved in studies on the efficacy of musical therapy and Tai Chi exercise for older people with dementia in China, and a project on comparing healthy and active ageing outcomes between China, South Korea and EU countries. My current funded project is: the cultural understanding of dementia and ageing and the availability of health and social care services for older people with dementia in China, funded by Global Challenge Internal Seed Corn Grant 2018, Lancaster University Research Committee.

My research interests are:

- the inequalities of health and wealth in later life
- the social, demographic and policy determinants of healthy and active ageing
- the intergenerational relationships and livelihood of older people
- the residential segregation by age and ageism
- dementia care and awareness
- quantitative research methods

I mainly use quantitative research methods, but I would like to explore different research methods. I aim at developing innovative methods to undertake research within the areas of Ageing and Gerontology.