



# Celebrating our Year of **HEALTH**

2019 was Heriot-Watt University's Year of Health. Focused on engaging the public with Heriot-Watt's research, we hosted events ranging from family fun days to industry conferences, exhibitions to schools' competitions, all to showcase our innovations in healthcare, diagnosis and treatment.

I am delighted with the continued successes of our 'Themed Years'. Coordinating our public engagement activities has helped create outputs from many activities so much greater than the sum of the parts. The Year of Health has been a fantastic example of this in raising the profile of our impactful health-related research from all our Schools across all our global campuses. We have showcased diverse impacts, including in healthy ageing using psychology techniques, assisted living with robotic and artificial intelligence research, in fundamental neurobiology and in leading the way in developing the future thinking around smart cities. These are just a few brilliant examples of the amazing breadth of excellence we have in our University community.

**Professor Richard A. Williams OBE**  
Principal and Vice-Chancellor



Heriot-Watt has a truly multi-disciplinary approach to health-related research. Across the university, chemists, biologists, mathematicians, designers, computer scientists, physicists, social scientists and engineers are working together to create solutions to a range of health-related challenges.

Our researchers are helping to solve global health concerns from cancer to patient rehabilitation, creating new assistive devices

and developing the next generation of healthcare technologies. Throughout our Year of Health, we broadened awareness of this diverse work and engaged a wide range of people with our distinctive approach to health-related research. It is the breadth of our expertise and integrative approach which is helping us to create solutions for an array of healthcare challenges; sharing this knowledge and expertise is an important part of our effectiveness

**Professor Alan Gow**  
Academic Lead for Year of Health  
Heriot-Watt University

# INSPIRING the future

Throughout our Year of Health, we worked with school children and young people to design events and activities especially for them.

## HERIOT'S HEALTHY HOME COMPETITION

We began the year by putting out a call to primary school children across Scotland to help us design a healthy home, full of gadgets and tools to make families healthier and improve the health of the planet. We received 250 entries from schools reaching as far as Evie in Orkney and as close to home as Currie in Edinburgh.

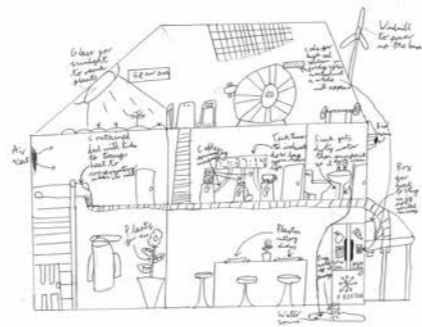
## ENGINEERING A HEALTHY FUTURE

In January, undergraduate students from the School of Energy Geoscience, Infrastructure and Society, were given one week to come up with engineering solutions for global challenges. The challenges were set by primary school children from three local schools, who identified health related problems in their homes and cities.

Teams of engineers, biologists, planners, surveyors and geographers worked in 36 multidisciplinary groups to come up with solutions to the challenges set by the Primary 6 pupils. Challenges were varied and thought-provoking, ranging from mental health, to fitness, healthy eating, recycling and pollution. Our students rose to the challenge and presented their solutions to the young judges at an interactive fayre in Oriam, Scotland's Sports Performance Centre.



Connell MacKinnon,  
St Joseph's Primary School  
Winner of Age 7-9 category



Jack Robertson's winning design  
in the age 10-12 category



## SCIENCE MEETS ART

Inspired by research taking place at Heriot-Watt, members of a local youth club created two distinct works of art to exhibit at our Family Fun Day at Oriam in April. In the six weeks running up to the Edinburgh Science Festival event, Kirknewton Youth Group worked with HW Engage and a team of researchers from the Institute of Biological Chemistry, Biophysics and Bioengineering. From researching and planning, through to design and creation, the group worked together to produce an amazing sculpture depicting the anatomy of a human skull, as well as an inspiring film about discovering life on Mars, to be shown on their own fictional news channel.



## INSPIRING ACROSS THE COUNTRY

Throughout the year, Heriot-Watt staff were involved in many other health-related events across the country, including inspiring events for children and young people throughout the year, including the annual Heriot-Watt Multi-Lingual Debate, the Royal Society Summer Science exhibition in London, shopping centre drop-in activities and a brand-new Science is Magic show at The Centre in Livingston.

WHETHER HEALTHY HOMES OR A HEALTHY PLANET, OUR RESEARCH IS MAKING A REAL DIFFERENCE

## REVOLUTIONISING THE CONSTRUCTION INDUSTRY

Professor Gabriela Medero is a civil engineer who, for years, has been concerned about the huge amounts of waste produced in the construction industry. After many years of research, testing and development, she has produced a solution with revolutionary potential – the K-Briq. The construction and demolition sector is the largest contributor of waste globally. Forty five percent of total UK carbon emissions come from construction and thirty two percent of landfill waste comes from construction and demolition in the country. This isn't sustainable and the UK's construction industry is under increasing pressure to reduce waste and meet targets of 70% of all building waste to be recycled from 2020. So, what's the solution?

Here at Heriot-Watt, her team created a brick made of 90% recycled construction and demolition waste and requires



one tenth of the energy to manufacture compared to traditional bricks. This allows a circular approach as taking the waste from a building site, recycling it, making it into a new building material and taking it back to the building site will answer so many problems for the industry.



# BELONGING to our communities

Working with our communities is vital, as it's their lives we seek to improve through research

## FAMILY FUN DAY

As part of the Edinburgh Science Festival, we transformed Oriam into a marathon of discovery! Over 4000 people attended the Family Fun Day, packed with workshops and interactive activities exploring healthy homes, bodies and minds. Visitors got hands on with cutting-edge research spanning robots and virtual reality to bacteria and body parts. We worked with local transport company, Edinburgh Coach Lines, to offer a free bus service to families from the Wester Hailes, Clovenstone and Sighthill areas of Edinburgh.

## BRAIN HEALTH DAY

Our Brain Health Day, hosted by The Ageing Lab in Heriot-Watt's Department of Psychology, celebrated the end of a three-year study looking at how taking up new activities might have benefits for thinking skills. The team shared the results of the study with an audience of over 200 people including the study's volunteers who had given their time to help the exploration into factors related to brain health.



## TALK LIPOEDEMA

In October, Dr Lisa Macintyre ran a workshop at the 'Talk Lipoedema' conference in Edinburgh. Ten women with lipoedema plus family members and nurses attended the workshop and shared their views on the difficulties associated with wearing compression garments designed for other conditions. Lisa is currently seeking funding to undertake research into the requirements of compression for people with lipoedema and those who prescribe it.

As part of her wider research, Lisa and her team are working with garment specialist 'Jobskin' to improve pressure garments for burn scar treatment, post-surgery and lymphoedema patients, and other similar conditions. From this, her team has developed a Pressure Garment Design Tool, which is now used by companies all over the world to make garments, meaning that more people can receive the long-term care they need.

## A HEALTHY AMOUNT OF ACTIVITIES

We shared our health-related research with our communities in a multitude of ways this year including our Local Lab research column in Konect magazine, reaching over 50,000 households across the west of Edinburgh, West Lothian and Falkirk.

We took part in festivals across the country, including Orkney International Science Festival, the Mother Tongues Festival in Dublin, both Edinburgh and Midlothian Science Festivals, and the Explorathon, Scotland's events for European Researchers Night. We also welcomed visitors onto campus to explore The Lyell Centre for Earth and Marine Science, as part of the national Doors Open Day celebrations.



## THE FOCUS OF OUR HEALTH TECHNOLOGIES AND HEALTH-RELATED RESEARCH IS, OF COURSE, HEALTHY PEOPLE

### CAN TAKING UP NEW ACTIVITIES IMPROVE THE HEALTH AND WELLBEING OF OLDER PEOPLE?

How do our thinking skills change as we age? Do our lifestyles affect those changes? These are the key questions directing research being undertaken by Professor Alan Gow and his team in The Ageing Lab at Heriot-Watt. The Ageing Lab explores how being active and engaged in later life might help to reduce or delay age-related mental decline. Current project 'The Intervention Factory' considers community-based activities as potential interventions for cognitive ageing and is gathering clearer evidence on which real life activities might deliver brain health benefits.

Alan's team are aiming to understand how different combinations of social, mental and physical engagement might be beneficial, and to clearly identify the lifestyle and behavioural factors that contribute to the health of our thinking skills as we age. Ultimately, their goal is to use that knowledge in order to develop new interventions.





# COLLABORATING with industry, practitioners and policy makers

Working with external partners and government is integral to creating research with impact

## HEALTH INNOVATION AND TECHNOLOGIES FESTIVAL

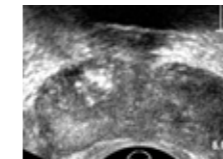
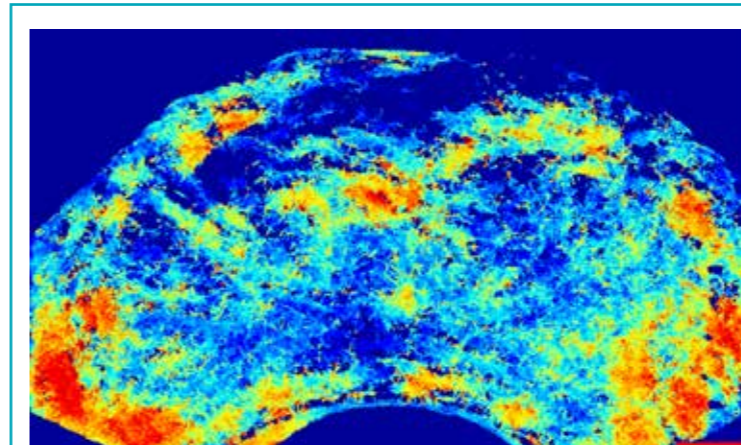
In April, we welcomed 150 delegates to our Health Innovation and Technologies Festival, celebrating the university's achievements in the health technologies sector. Alternatives to animal testing and the future of cancer healthcare were just some of the topics discussed. Alongside a series of engaging talks and workshops, a photographic exhibition proved to be particularly popular among guests thanks to the striking images showcasing the latest innovations in medical technologies research. The two-day event featured an exceptional mix of inspiring academics, patients, charity representatives and funders from around the world.



## THE SCOTTISH PARLIAMENT'S YOUNG PEOPLE'S FESTIVAL OF POLITICS

As part of city-wide St Andrew's Day Celebrations, our researchers took part in the Scottish Parliament's Young People's Festival of Politics. This flagship event for the 'Year of Young People' provided a day of inspiring talks, activities and workshops at the Parliament for 14-26 year olds, aimed to drive discussion around a future Scotland.

A host of Heriot-Watt researchers were on hand to discuss their research and inspire the next generation, including hands-on exhibits, expert panels, and interactive workshops. The NanoSafety Research Group's interactive stand was a big success with more than 70 young people learning about toxicology and taking home a 'Cellfie'. Thought provoking discussions were ignited by Dr Heidi Burdett, a Lyell Centre Research Fellow and one of our Public Engagement Champions, who was invited to be part of an expert panel on Climate Change, questioned by a young and highly informed audience.



## ULTRASOUND BREAKTHROUGH CAN PINPOINT CANCER WITH PRECISION

A team of scientists, led by Dr Vassilis Sboros, have unveiled a new cancer diagnostic technique using super-resolution ultrasound methods. The largest revolution in ultrasound technology in over 60 years is expected to lead to earlier cancer diagnoses and allow medical staff to target treatments more effectively.

Further research will help establish this method within diagnostic procedures and should also help assess the effectiveness of cancer treatment more promptly. The team also aim to expand the remit of their method to allow early screening of the population for a number of at-risk patients. Additionally, this method could be applied to a number of other conditions and diseases such as cardiovascular disease, diabetes, liver disease, transplant rejection and others.

# Perspectives and people

139

ACADEMIC STAFF

51

SUPPORT STAFF

1,550

SCHOOL PUPILS

730

STUDENTS

18,800

PEOPLE

60

PUBLIC EVENTS AND ACTIVITIES

40

SCHOOLS

156 MILLION

NEWS REACH

“

*Seeing their ideas come to life was very exciting for them. In addition, the way the children were interacting with the students was fantastic. I saw some of my children, who are usually really shy, chatting away to adults they don't know - it was great.*

**Miss Strange**, Currie Primary School on Engineering a Healthy Future

“

*The team are a shining example of what a Scottish University, working in collaboration with international partners, can achieve. They are a national treasure.*

**Joanna Cherry**, Edinburgh South West MP on the ORCA Hub's Royal Society Summer Science Exhibition in London

“

*Best of all was seeing the benefits of 'Engineering a Healthy Future' for all involved. From the school children who authored and assessed the challenges to the undergraduates' teamwork and confidence building in communication, and the PhD student mentors who developed their own teaching skills giving them some experience for their future academic careers.*

**Helen Raftopoulos**, SFC Assistant Director (Health and Care) on Engineering a Healthy Future

“

*Great fun and educational!*

**Doors Open Day visitor**

“

*I work for the NHS so appreciate the importance of research, however this was a good reminder as to how wide the field of research is.*

**Explorathon visitor, September 2019**

“

*I didn't know science was so POWERFUL because the baking soda and vinegar created an explosion. I am going to try it at home with my mum because safety comes first.*

**Ava**, aged 10 from St Anthony's Primary School on the Science is Magic Show

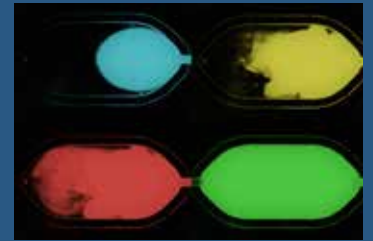
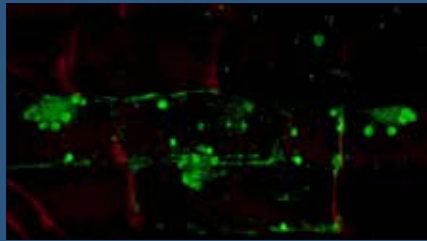
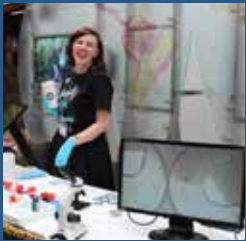
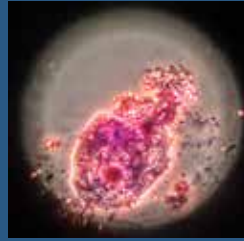
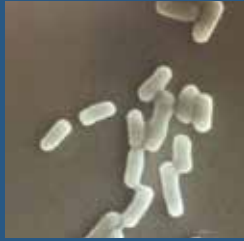
“

*The whole event, with all its many elements, hung together seamlessly to make a very enjoyable experience. It was light-hearted, amusing and informative and highly accomplished.*

**Brain**, Health Day participant



*We challenged our researchers to capture and share their health-related research through visual storytelling. The images below were shortlisted, put to a public vote and winners announced on 12th December 2019.*



[www.hw.ac.uk/yearofhealth](http://www.hw.ac.uk/yearofhealth)

 @HeriotWattUni

#YearofHealth2019

**Supported by**

**EPSRC**  
Engineering and Physical Sciences  
Research Council

**UK Research  
and Innovation**