

Press release: Worms in space: The Molecular Muscle Experiment

Hundreds of worms are being flown to the International Space Station later this year for scientists to understand more about spaceflight-induced muscle loss.

The team of scientists from Exeter, Nottingham and Lancaster Universities involved in this project hope to discover more about muscle loss in space, which in turn could lead to developing effective therapies and new treatments for muscular dystrophies. The research could also help boost our understanding of ageing muscle loss and even help improve treatments for diabetes.

Sam Gyimah, Science Minister, said:

It's not every day that you hear of the potential health benefits of sending worms into space, but this crucial project which is also the first of its kind, could lead to better treatment for muscular conditions for people on Earth as well as improving the wellbeing of our astronauts.

Along with our commitment through the modern Industrial Strategy to support our space sector to go from strength to strength, our world-leading research sector is consistently pushing the boundaries of existing knowledge for the benefit of all.

Spaceflight is an extreme environment that causes many negative health changes to the body and astronauts can lose up to 40 per cent of their muscle after 6 months in space. These changes are regarded as an excellent model for the ageing process in the body, and scientists are able to use the knowledge gained from studying changes in astronauts to better understand the ageing human body.

Libby Jackson, Human Spaceflight and Microgravity Programme Manager at the UK Space Agency, said:

This is the first of many exciting experiments heading to the International Space Station from the UK, thanks to our contributions to the European Space Agency. The Molecular Muscle Experiment will provide knowledge that will benefit our understanding of muscle ageing and help to improve life on Earth.

The microscopic worms being used in the experiment, known as *C. elegans*, share many of the essential biological characteristics as humans and are affected by biological changes in space, including alterations to muscle and

the ability to use energy.

Nate Szewczyk, Professor of Space Biology at the University of Nottingham, said:

The Molecular Muscle Experiment aims to understand the causes of neuromuscular decline in space. This research will help us establish the precise molecules that cause muscle problems during spaceflight and enable us to test the effectiveness of novel therapies for preventing the muscle decline associated with spaceflight.

Tim Etheridge, Senior Lecturer at the University of Exeter, said:

Worms are, perhaps surprisingly, a very good model for human muscle maintenance. At the molecular level, both structurally and metabolically they are highly similar to that of humans and from a space flight specific perspective – they provide a lot of practical advantages. They are very small, quick to grow, cheap and easy to maintain. It makes them good to work with.

The Molecular Muscle Experiment is the first UK-led experiment to take place on the International Space Station. UK scientists are able to carry out this research thanks to the UK Space Agency's subscriptions to the European Space Agency's exploration programme, which contributes to the costs of the International Space Station, which the UK joined in 2012.

Tim Etheridge continued:

Spaceflight represents the accelerated human model of the ageing condition and so, hopefully, by understanding the molecular changes it may provide the opportunity to understand human ageing on earth.

The project is supported by the UK Space Agency, European Space Agency, BBSRC, MRC, and Arthritis Research UK and the launch is currently scheduled to take place between November 2018 and February 2019.

Press release: Current and future state of nation's health revealed

The [Health Profile for England report](#) covers life expectancy; major causes of

death; mortality trends; child health; inequality in health; wider determinants of health; and current health protection issues. Data and evidence contained in Health Profile for England will be used to help shape the forthcoming NHS long term plan.

As a society, people are living longer – life expectancy in England has reached 79.6 years for men and 83.2 for women and we're healthier at every age group than ever before. However, stubborn inequalities persist – in the richest areas people enjoy 19 more years in good health than those in the poorest areas.

A major theme of the Health Profile for England report is future trends in health, which will aid policymakers to prioritise efforts to prevent ill health not just deal with the consequences.

Some of the most notable findings include:

- the number of people aged 85 years has more than tripled since the 1970s and will include more than 2 million people by 2031
- the death rate for dementia and Alzheimer's disease – already the leading cause of death in women – may overtake heart disease in men as early as 2020 and is likely to become the leading cause of death in men too
- the number of people with diabetes is expected to increase by a million – from just under 4 million people in 2017 to almost 5 million in 2035
- in the last 7 years, smoking prevalence has dropped by a quarter to 15% and as little as 10% of the population could still be smoking by 2023

The report also provides details on the nation's current health position:

1. UK women's health is faring worse than their European counterparts, ranked 18th lowest out of 28 EU member states for premature death. UK men are doing better by comparison and are ranked 10th.
2. Low back and neck pain and skin disease (dermatitis, acne and psoriasis) are the 2 leading causes of morbidity for men and women, with hearing and sight loss also ranking highly for both sexes
3. While most causes of morbidity become more prevalent with age, mental health problems and substance use affect younger adults the most, accounting for more than a third of the disease burden in those aged 15 to 29 years.

Duncan Selbie, chief executive at Public Health England, said:

Inequalities in health undermine not only the health of the people but also our economy.

As we work to develop the NHS long term plan, we must set the ambition high. If done right, with prevention as its centrepiece, the payoff of a healthier society and more sustainable NHS will be huge.

Professor John Newton, director of health improvement at Public Health England, said:

Now in its 70th year, demands on the NHS have changed significantly.

More of us are living longer with painful or disabling conditions, including musculoskeletal problems, skin conditions and sensory loss. While these illnesses often attract less attention than causes of early death such as heart disease and cancer, they have a profound effect on the day to day lives of many people and together they place significant pressure on the NHS.

The challenge now is for the NHS to respond to this changing landscape and to focus on preventing as well as treating the conditions which are causing the greatest disease burden across our nation.

The new report also shows that good public health is not defined by health policy alone – a high-quality education, a well-designed and warm home, a good job and a community to belong to are just as important.

Health Profile for England has been created with policymakers, both national and local, in mind. PHE wants them to use the report as a shared reference point and to think about the broader impact of their policies on health. The report also links to further PHE tools to allow local policymakers to see how their area compares with the national picture.

Background

The Health Profile for England report's 7 chapters are:

1. Population change and life expectancy
2. Trends in mortality
3. Trends in morbidity and risk factors
4. Health of children in the early years
5. Inequality in health

6. Wider determinants of health

7. Current and emerging health protection issues

PHE is leading the prevention, personal responsibility and health inequalities work stream as part of the development of the NHS 10 year plan.

Press release: PM unveils plans for UK to become world leader in low emission tech

- £106 million funding boost for research and development in green vehicles, new batteries and low carbon technology
- PM's 'ambitious mission' to put the UK at the forefront of the design and manufacturing of zero-emission vehicles as part of the modern Industrial Strategy
- Industry announce over £500 million worth of investment creating over 1,000 jobs across the UK, as PM hosts roundtable on accelerating the development of the zero-emissions market and driving more foreign direct investment into the UK
- 11 countries sign UK's new international declaration on low emissions, kick starting a new era of global collaboration at Summit in Birmingham

A £106 million package for projects developing innovative green battery, vehicle and refuelling technology will be unveiled by the Prime Minister at the country's first ever Zero Emission Vehicle (ZEV) Summit.

Speaking at the event in Birmingham, Theresa May will refer to her 'ambitious mission' for the UK to become world leader in low emission technology as part of a drive to keep the country green. The Transport Secretary, Chris Grayling, Business Secretary, Greg Clark, and Trade Secretary, Liam Fox will also be in attendance.

At the summit, the Prime Minister will also host an automotive roundtable with leading supply-chain companies from Germany, the USA, Japan, China, Spain and India, to explore what more the government and industry can do together to accelerate the development of the zero-emissions market and to highlight the UK's strong offer.

This is the third in the government's series of investment roundtables which promote UK industry sector opportunities to a global audience, and drive foreign direct-investment into the UK as we prepare to leave the European Union.

The government will also unveil a new, international declaration that will forge the way for the worldwide deployment of green vehicles, and the introduction of smart, zero-emission infrastructure.

The first signatories to the 'Birmingham Declaration' include Italy, France, Denmark, the United Arab Emirates, Portugal, Belarus and Indonesia, with more nations currently in talks to sign up. This will form the basis of increasing international engagement at climate conferences throughout the year to accelerate the global transition.

The Prime Minister is expected to say:

I want to see Britain, once again, leading from the front and working with industries and countries around the world to spearhead change.

That is why I have set this country an ambitious mission. To put the UK at the forefront of the design and manufacturing of zero-emission vehicles, and for all new cars and vans to be, effectively, zero-emission by 2040.

Already, we are taking significant strides forward. Our electric UK-manufactured cars account for one-in-five sold in Europe. Our batteries are among the best in the world.

And our Road to Zero Strategy is the most comprehensive plan globally – mapping out, in detail, how we will reach our target for all new cars and vans to be, effectively, zero-emission by 2040 – and for every car and van to be zero-emission by 2050.

Today we have provided over £100 million of funding for innovators in ultra-low emission vehicles and hydrogen technology. With a further £500 million of investment from key industries in this sector.

These measures will drive the design, use, uptake and infrastructure necessary for cleaner, greener vehicles – and in doing so, it will help us drastically reduce a major contributor to our global warming emissions, as we seek to meet the Paris Climate Change Agreement.

The work is all part of the government's Future of Mobility Grand Challenge, outlined in its modern Industrial Strategy, aiming to help reduce greenhouse gas emissions, make travel safer, improve accessibility, and present enormous economic opportunities for the UK.

This is the next step in the mission to put the UK at the forefront of zero-emission technology and it sees industry stepping up to the challenge alongside the government.

Today industry has announced that it is investing over £500 million in

projects relating to low emission technology, creating 1,000 jobs across the UK. These announcements include:

- JEE is investing around £6 million in the UK to establish an assembly and testing facility in Birmingham, employing around 20 highly skilled people by 2020
- Aston Martin are announcing a further £50 million investment at its new St Athan facility in Wales, which will become its centre for electrification and the home of the Lagonda brand. The investment will create an additional 200 jobs at the site and, in total, the new plant will bring up to 750 high skilled jobs to South Wales
- Cummins will invest £210 million in Research and Development in the automotive (and associated) industries over the next three years in the UK
- The EV Network, UK-based charging station development company, is developing 200 fast-charging stations throughout the UK, representing an investment of around £200 million. The company has joined forces with Leclanché who will be supplying the battery storage solutions to the stations. EVN and Leclanché are announcing an EV Charging Centre of Excellence in Warwick
- New Williams Advanced Engineering and Unipart Manufacturing Group joint-venture Hyperbat Limited will open the UK's largest, independent, vehicle battery manufacturing plant in Coventry in early 2019. The site will create around 90 new, high-value, high-tech jobs
- Zhuzhou CRRC Times Electric Co., Ltd. (TEC), a subsidiary of CRRC, has confirmed Birmingham as the location for its new UK R&D Innovation Centre for EVs, rail, and renewable. The centre will employ more than 150 engineers by 2022, with an overall investment of up to £50 million
- Lloyds Banking Group, the principal partner of the ZEV Summit, is announcing a new £1 million fund for electric vehicle leases to incentivise zero-emission driving. The fund is for the first 1,000 customers who sign up for a pure electric vehicle from Lex Autolease, the vehicle leasing arm of the group, from January 2019
- Ryobi Aluminium Casting UK are investing £7 million in melting furnace and die-casting machines, to increase production of precision transmission components
- Lear Corporation is investing £54 million in its UK seating operations, with £19 million to go into capital and training and £35 million into engineering. The investment creates another 220 jobs and safeguards 600
- Leading science and engineering company QinetiQ is expanding its Power Sources, Energy Storage & Distribution business, growing its team by 25% and making an initial £2 million investment in facilities in Farnborough over the next 9 months
- Leoni will be investing £7 million in a new technical centre in South Warwickshire, creating over 100 new design & development jobs, working with major OEMs in developing technologies for the next generation of autonomous and electric vehicles
- MINTH plans to establish a new facility in UK to service new orders from UK OEMs, and is developing new products to reflect the shift towards light-weight electrification and autonomous driving in the automotive

News story: Asian hornet: Fowey nest destroyed as two new sightings confirmed in Liskeard and Hull

The National Bee Unit has called for the public to report any suspected Asian hornets after two further confirmed sightings in Liskeard, Cornwall and Hull, east Yorkshire. At this stage, there is no evidence to suggest the Cornwall and Hull sightings are linked.

The Asian hornet is smaller than our native hornet and poses no greater risk to human health than a bee. However, they do pose a risk to honey bees and work is already underway to identify any nests in the Liskeard and Hull areas, which includes deploying bee inspectors to visit local beekeepers and setting up monitoring traps.

As part of this work, bee inspectors from APHA National Bee Unit are carrying out surveillance and monitoring in a 1-2 km radius around the sightings.

The hornets in Fowey were first discovered earlier in September and the National Bee Unit moved swiftly to find the nest and remove it. During September the number of hornets in a nest can reach a peak and this will increase the chances of seeing an insect.

Nicola Spence, Defra Deputy Director for Plant and Bee Health, said:

These sightings in Liskeard and Hull underline the need to remain vigilant. I want to encourage people to look out for any Asian hornet nests and if you think you've spotted one, please report your sighting through the Asian hornet app or online.

While the Asian Hornet poses no greater risk to human health than a bee, we recognise the damage they can cause to honey bee colonies. I am therefore pleased our well-established protocol to contain them has worked so effectively in Fowey.

If you suspect you have seen an Asian hornet you can report this using the iPhone and Android app 'Asian Hornet Watch' or by emailing alertnonnative@ceh.ac.uk. [Identification guides and more information are available.](#)

Background

- Members of the public can also report sightings by email to alertnonnative@ceh.ac.uk with a photo or on the Great Britain Non-native Species Secretariat website.
 - The Great Britain Non-native Species Secretariat is a joint venture between Defra, the Scottish Government and the Welsh Government to tackle the threat of invasive species. More information can be found on their [website](#).
 - For details on the appearance of an Asian hornet please can be found on [Bee Base guide](#) or the [non-native species identification guide](#).
 - Photographs of the Asian hornet are available on our [Flickr](#) account
 - The cost of eradication on private land will be met by APHA.
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