New Scientist

For daily news stories, visit newscientist.com/news

Algae survive in outer space for over a year

PRIMITIVE plants are the latest forms of Earth life to show they can survive in the harshness of space, and for many months.

The algae were a species of *Sphaerocystis*, codenamed CCCryo 101-99, and were returned to Earth in June last year after 530 days on a panel outside the International Space Station. While space-borne, they withstood the vacuum, temperatures ranging from -20 °C at night to 47.2 °C by day, plus ultraviolet rays strong enough to destroy most life on Earth if not filtered out by the atmosphere.

"As far as I know, this is the first report of plants exposed on the surface of the space station," says Thomas Leya of the Fraunhofer Institute for Cell Therapy and Immunology in Potsdam, Germany, who organised the experiment.

It was Leya who discovered CCCryo 101-99 on Norway's remote Svalbard peninsula. When dormant, these algae become thick-walled orange cysts, rich in protective carotenoids. But when seasonal rains arrive, they rapidly resume making chlorophyll and turn green again. "If you give them water, the cysts germinate and revive," says Leya.

For the experiment, Leya dried out the algae and coaxed them into the cyst-like state, where they just ticked over without reproducing, feeding or multiplying. Mounted on the panel, the algae were open to space but overlaid with a transparent filter to cut the radiation dose somewhat. All but one sample survived the trip. "Within just two weeks they become green again," says Leya.

"The experiment shows that some terrestrial organisms are robust enough to cope with months of exposure to open space conditions without a space suit," says René Demets of the European Space Agency. It lends some weight to the "panspermia" theory, that comets and meteorites could potentially ferry life around outer space. Andy Coghlan ■

OXFORD UNIVERSITY HOSPITALS NHS FOUNDATION TRUST

Smart charts help nurses

NHS to prescribe apps that keep tabs on health

THE future of healthcare could be in your pocket. Two new medical apps that help people monitor their health at home, reducing their need to visit a doctor, are set to be rolled out to as many as four more UK National Health Service trusts over the next year.

The apps, which are currently being trialled in different NHS trusts, transmit patient data from a tablet or smartphone directly to clinicians. According to Ilan Lieberman, a member of the Royal Society of Medicine's council on telemedicine and e-health, such apps will have a huge impact on managing chronic diseases.

One system, called GDm-health, helps oversee the treatment of gestational diabetes – a condition that affects about 1 in 10 pregnant women. The smartphone app lets women send each blood glucose reading they take at home to their diabetes clinician.

"Now when a diabetes midwife logs on between clinics, she will see all the patients who are most in need of attention," says Lionel Tarassenko of the Oxford University Institute of Biomedical Engineering, who led the team behind the technology. A two-year trial at the Royal Berkshire NHS Foundation Trust showed that the system meant patients didn't need to go to the clinic in person as often, reducing the number of visits by 25 per cent.

Another system being developed by the same team is for managing chronic obstructive pulmonary disease (COPD), a condition that affects between 1 million and 1.5 million people in the UK. Patients with COPD use a finger probe to measure their heart rate and blood oxygen saturation every day and enter the results into an app. After three months, the app learns a patient's specific range of normal oxygen saturation levels, and issues an alert to clinicians when a reading falls below that range. "It is very important that the analysis adapts to individuals," says Tarassenko. If the system is too sensitive, it will send too many alerts, but if it's not sensitive enough, it might miss problems.

> **"It's a bit like the Wild West out there with lots of keen and very motivated people producing these apps"**

In a 12-month clinical trial, the app reduced hospital admissions by 17 per cent and visits to the doctor by 40 per cent. "Patients are much more confident about managing themselves and are getting into trouble far less often," Tarassenko says.

The team has a third product ready for rollout, but this is not aimed at patients self-monitoring. Called SEND, it is an iPad app used by nurses to input details about patients' vital signs as they make their rounds of the wards. It automatically calculates an early warning score based on the vital signs, letting staff know if a patient is deteriorating.

Rury Holman at the Oxford Biomedical Research Centre thinks trialling the apps in NHS hospitals is a good idea. Although plenty of health monitoring apps already exist, he believes that if similar apps are going to be used in the UK healthcare system, it's vital they are developed in close collaboration with the NHS.

"It's a bit like the Wild West out there with lots of keen and very motivated people producing these apps," he says. "What we need are consistent standards and an interface with electronic patient records, particularly with the NHS, so that information, with permission from the patients, can be put to use centrally."

Developing these apps has taken eight years, but Tarassenko says securing the appropriate ethical clearance and building up a clear evidence base for their use is a critical journey. "It's been very important for us to have credibility with our clinical colleagues, and we will continue to do that because it's designed in the NHS, for the NHS." Matt Reynolds ■

PUBLICATION	New Scientist
DATE	18th February
CIRC / MUU	126,320