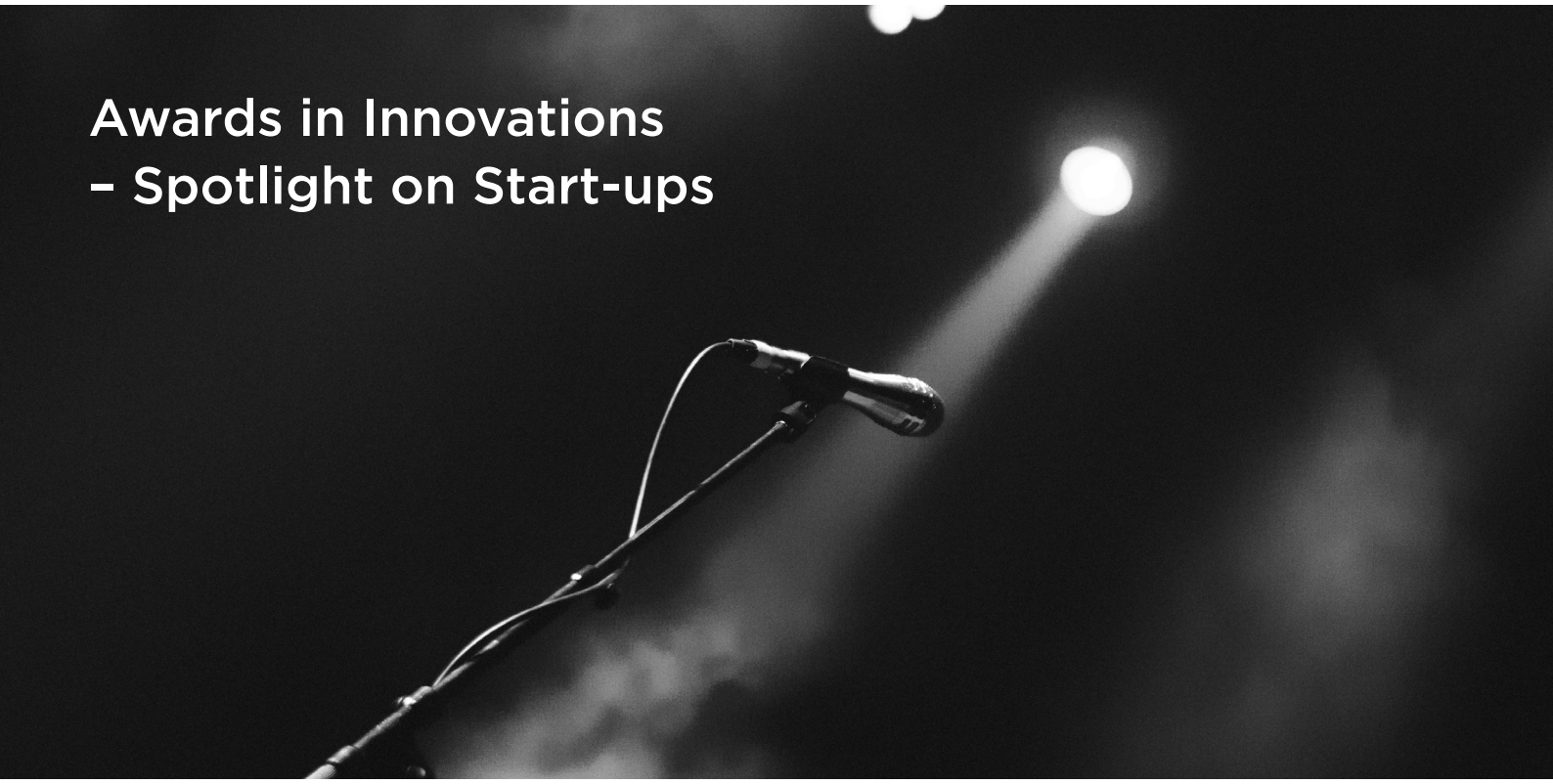
Awards in Innovations – Spotlight on Start-ups



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We've all heard of the Silicon Valley start-ups who have revolutionised the modern world. They've produced the likes of Apple, Google, Facebook, and Uber. But as more and more entrepreneurs leave the Californian business haven, more money is being invested elsewhere, especially in healthcare start-ups; Business Insider crowned healthcare as the top industry for artificial intelligence (AI) start-up funding in 2019.[1] We take a look at this year's most successful, creative, and undeniably lifesaving start-ups which have been commended for their forward-thinking and outside-the-box ideas to revolutionise global healthcare systems.

UK and Ireland

The 2019 Univants of Healthcare Excellence Awards[2] by Abbott Diagnostics were initially started to recognise teams within the healthcare industry who have collaborated across disciplines to transform patients' lives. Commended this year was a team from the University of Dundee, Dundee, UK, who came together to create an intelligent liver function test (iLFT) for the early detection of liver disease.[3] Prof John Dillon of the University of Dundee, and his team noticed that: "All too often we were seeing patients dying of liver failure who had an abnormal LFT recorded years before when something could have been done."[4] The intelligent part of the new test involves inputting LFT results into software that can detect the early warning signs of not just liver disease, but autoimmune liver diseases, hepatitis C, and metabolic diseases.

UK start-ups are also attracting interest from the rest of Europe, with start-up DNAnexus[5] being awarded the Clinical Research News European Innovation Award[6] in September for their biospecimen and data resource cloud platform of >500,000 individuals. Already, DNAnexus has accelerated discovery with pharmaceutical companies, healthcare organisations, and academics alike using the software, which can now boast citations in >170 publications.

Italy

The unofficial home of healthcare start-ups Italy scooped a total of 7 of the 15 available grants, each worth €50,000, at the 2019 European Institute of Innovation and Technology (EIT) Health Headstart Awards.[7] Biomedicallab,[8] who created the Parkinson's Disease Watch, was one such award recipient. The wearable device can access the therapeutic effects of the current treatment by monitoring patient motor symptoms, with the aim of finding the best treatment option possible

and acting as a form of personalised medicine. Another awardee was smartDONOR,[9] which offers a space for communication between blood donors and operators to ultimately increase efficiency by promoting a community of blood donors and informing volunteers on the real-time donation needs of their city. From a mental health perspective, Mindlenses Professional[10] provides a web platform divided into four areas: medical records, neuropsychological evaluation, rehabilitation, and report. The project began with Prof Massimiliano Oliveri, previously of Harvard University, Cambridge, Massachusetts, USA, and now a cognitive neuroscience specialist at the University of Palermo, Palermo, Italy. Accessible from any device, personalised treatment plans can be created for patients through digital rehabilitation, making use of the latest research from the laboratory.

Portugal

Staying in western Europe, Portugal has recently generated several innovative companies worthy of an EIT InnoStar Award.[11] First up we have B-CULTURE:[12] a novel start-up that designs 4D *in vitro* human tissue models for drug testing in pharmaceutical and cosmetic industries. This is an extremely topical subject, especially with increasing pressure on research institutes to reduce testing on animals and the creation of institutes such as the National Centre for the Replacement, Refinement, and Reduction of Animals in Research (NC3Rs). However, the UK Home Office published statistics in 2018 revealing that despite the availability of predictive, non-animal computer models, the UK are still using >3.5 million mice, cats, and rabbits every year for research.[13] On the theme of urology, Portuguese start-up HydrUStent[14] have developed a portable, minimally invasive ureteral stent that eliminates bacterial infections and allows long-term continuous monitoring. The team's focus is on healthcare systems that lower medical costs and decrease environmental impact; the HydrUStent reduces costs by 60% as it lessens the need for second surgery and produces zero waste as it is biodegradable. In the same playing field, is TimeUp,[15] who are also an InnoStar Awardee for their medical device: a urine monitor for the detection of bacteria, indicative of a urinary tract infection. Placed between the catheter and urine bag, continuously auditing patient's urine, it is hoped that it may minimise the €84 million spent annually in Portugal on cases of urinary tract infection.

Romania

Travelling across to Cluj-Napoca in Romania, the recent StartUp Europe Awards[16] recognised the start-ups making the most impact in the world of social healthcare innovation. Winner of the Best Female-led Start-up category was OKRA Technologies,[17] founded by Dr Loubna Bouarfa. OKRA is an AI system with the power to predict and make suggestions across the life sciences field. By ensuring the right drug is given to the right patient at the right time, OKRA has revolutionised clinical medicine by predicting surgical error preoperatively and in real time. Dr Bouarfa of St John's Innovation Centre, Cambridge, UK, is a member of the European Union's (EU) High-Level Expert Group and has recently called on data companies to collaborate to progress healthcare innovations to the levels needed for us to tackle the most prevalent global diseases. She spoke passionately to data companies at the EFPIA Oncology Data Summit, stating: "If we look back at recent significant, scientific breakthroughs in cancer treatment, they are all driven by data."[18] She also sought to crease out the misconceptions surrounding AI, stressing that it can be used to "support physicians with mundane tasks and decision making."[18]

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Poland

Crossing the borders of eastern Europe to Poland, we are back at the EIT Health HeadStart Awards, in which Polish start-up BrainScan[19] is revolutionising data set handling. The AI system searches a database of CT and MRI scans for similar cases to aid doctors in their diagnosis. The EIT InnoStars Awards also highlighted Poland's innovative advances, with UVera[20] receiving the €25,000 funding to continue their work on skin protection against the entire spectrum of ultraviolet sun radiation. With a particular focus on minimising the ecological impact of sunscreen lotions which are harming marine water, their ultraviolet protector is harvested from cyanobacteria and is therefore harmless to wildlife.

What's Next for Healthcare Start-Ups?

If you are curious about where to look next for start-up innovations, EU-Startups have put together a list[21] of the most exciting and eagerly anticipated technologies to watch out for in the not-too-distant future. First up we have FindMeCure,[22] a tool for patients and their families to search for on-going clinical trials in their surrounding area. Such a platform could provide newfound hope for those diagnosed with rare or difficult to treat conditions. Other companies include German based Mecuris,[23] who are using 3D printing technology to personalise prosthetics and orthotics to give a 100% customised fit, whilst also lowering production times by 75%. Also in the sphere of rehabilitation technology are ABLE Human Motion,[24] who are producing an exoskeleton for spinal cord injury patients so that they might regain their capacity to walk intuitively. The firm recognise the debilitating effects of paralysis socially and psychologically, and therefore it is their aim to reach the market by next year. By the looks of things, we could be on track for an even bigger year for healthcare start-ups in 2020 than we have had in 2019.

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