

**PRESS RELEASE**

**Combating dengue fever with mosquitoes:
British scientist-entrepreneur Luke Alphey named finalist
for the European Inventor Award 2015**

* **With no cure or vaccine available, targeted control of the mosquitoes carrying the dengue virus is vital to save lives**
* **Environmentally-friendly pest control thanks to genetics: DNA modification prevents *Aedes aegypti* mosquito from reproducing**
* **In field trials Alphey and his team managed to reduce the target mosquito population by more than 90 per cent – an unprecedented level of success**
* **EPO President Benoît Battistelli: “Dengue fever is on the rise worldwide. Luke Alphey’s innovation could be the weapon needed to contain this deadly disease in a targeted way.”**

**Munich/Oxford, 21 April 2015 –** A gene is saving people’s lives: Thanks to the ground-breaking research of 51-year-old British scientist Luke Alphey, it is now possible to control the population of disease-carrying mosquitoes in an environmentally-friendly and sustainable way using genetic engineering. Alphey has developed a patented method to control insect pests that damage crops and spread disease. His invention has been trialled in countries around the world to control the invasive *Aedes aegypti* mosquito that spreads painful infectious diseases such as dengue fever, yellow fever and chikungunya. For this achievement, the European Patent Office (EPO) has named Alphey one of three finalists
for the European Inventor Award 2015 in the “Research” category. The winners of the
10th edition of the annual innovation prize will be announced at a ceremony in Paris on
11 June.

“Luke Alphey’s research work has resulted in a targeted and environmentally-friendly method to combat dengue fever,” said EPO President Benoît Battistelli, announcing the finalists of this year’s European Inventor Award. “His revolutionary method of controlling the spread of the disease could be the weapon needed to contain dengue fever in a targeted way.”

**Dengue fever on the rise**

Dengue fever is a global scourge, which can lead to severe illness or death. The number of people being infected with the deadly disease has risen dramatically in recent decades. Nearly 400 million people are infected every year, with 25 000 of those cases resulting in death. According to the WHO, almost half of the world’s population are at risk of contracting dengue fever. The main culprit behind its spread is the *Aedes aegypti* mosquito, which is now found on six continents and in over 100 countries, and continues to spread. Conventional means of controlling its population are inefficient and mostly toxic: even insecticide sprays do not prevent the *Aedes aegypti* mosquito from spreading, as in most cases they do not reach the insects, which often hide in hard-to-reach places around people’s homes. Instead they may actually poison useful insects and plants and, as a result, enter into the food chain. The mosquitoes are also developing resistance to some insecticides. New tools are clearly needed.

**Fighting fire with fire: using the mosquito as a tool to control its own species**

Luke Alphey’s invention is set to provide a revolutionary alternative. He explains: “Our idea was to try to improve pest control methods to make something very specific to the particular pest to minimise the off-target environmental consequences.” Instead of actively trying to find every mosquito transmitting dengue fever, his method uses the mosquito as a tool to control its own species. The male *Aedes aegypti* mosquitoes are effectively ‘sterilised’ through genetic engineering so that when released modified male mosquitoes mate with female dengue-fever carrying mosquitoes their offspring do not survive. The modified males, which don’t bite or spread disease, can access sites that are difficult to reach with other methods. With every release, the pest mosquito population is reduced further; fewer biting mosquitoes mean a lower risk of disease transmission. The mosquitoes can be used in a targeted way and be set free in densely populated areas. Field trials have taken place in several countries already – Cayman, Malaysia, Brazil and Panama – with more planned projects underway. Every trial has resulted in more than a 90 per cent reduction of the targeted *Aedes aegypti* population – an unprecedented level of control compared with other methods. Moreover, the insects and the gene do not persist in the environment as chemicals do. This control method is also species-specific, so it does not harm beneficial insects such as bees either. Alphey concludes: “We could not measure the reduction in dengue but models suggest that the degree of suppression of the mosquitos would be enough to stop epidemic dengue anywhere.” The national biosafety group in Brazil has now approved this mosquito for commercial release.

**Scientist-turned-biotech entrepreneur**

From a young age, Luke Alphey was driven by curiosity about how the world works. His interest in science led him to study genetics at Cambridge University. In 1988, he received a PhD in biochemistry from the University of Dundee, followed by research posts at Imperial College London and again at the University of Dundee. In 1994 Luke Alphey took up a lecturing post at the University of Manchester and in 1997 became an MRC Senior Research Fellow and later Reader in Genetics at the Department of Zoology at the University of Oxford where he is now a Visiting Professor.

The idea to combat diseases transmitted by insects by means of genetically modified animals is not a new one. As early as in the 1950s US scientists sterilised unwanted insects using radiation. This “Sterile Insect Technique” (SIT) was successfully used for controlling the screw-worm in Curaçao as well as the tsetse fly on Zanzibar. However, radiation weakens mosquitoes to such an extent that the desired effect cannot be achieved. Alphey heard about this and the limitations of dosing mosquitoes with radiation from a colleague who was involved with SIT at the University of Oxford. “It was then I realised that the molecular genetic tools that I had been using for my very basic scientific research could be applied to the control of pest insects,” says Alphey. “The idea was to carry out a kind of genetic sterilisation.” In 2002 he co-founded the Oxford University spin-off Oxitec (Oxford Insect Technologies) in order to turn his technology into a marketable product. To do so, he received numerous grants from public and private sources. The British biotech company now has a staff of about 50. Luke Alphey is now at The Pirbright Institute to further his ground-breaking research in genetic control of insect pests; he continues to support Oxitec as a non-executive director.

Thanks to his pioneering spirit, British scientist Luke Alphey managed to develop the world’s first product which can control dengue fever with no toxic chemicals and minimal off-target impact.

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| **Additional resources**[**Video and photo material**](http://www.epo.org/news-issues/press/european-inventor-award/alphey.html)[**Read more about the inventor**](http://185.49.16.67:8080/razuna/raz1/dam/index.cfm?fa=c.sf&f=272F76B4976F4A3E8AC4F05F30AF0CAF&v=o)**View the patent:** [**EP1246927**](http://worldwide.espacenet.com/publicationDetails/biblio?DB=worldwide.espacenet.com&II=0&ND=3&adjacent=true&locale=en_EP&FT=D&date=20021009&CC=EP&NR=1246927A2&KC=A2)[**10 years of the European Inventor Award: a retrospective look at the inventors and ideas that have changed our lives**](http://www.epo.org/news-issues/press/releases/archive/2015/20150122.html)[**About the European Patent Office (EPO)**](http://www.epo.org/news-issues/press/background/epo.html)[**Study on the economic impact of patents and other IP rights**](http://www.epo.org/news-issues/news/2013/20130930.html)**Contacts:**Rainer Osterwalder Director Media RelationsEuropean Patent OfficeTel. +49 (0)89 2399 1820rosterwalder@epo.orgJeremy PhilpottProject ManagerEuropean Patent OfficeTel. +49 (0)89 2399 1805jphilpott@epo.orgMaria DivineyShepard Fox Communications Tel. +44 2033 184491maria.diviney@shepard-fox.com |