WHAT IS GENE DRIVE?

Gene drive is a genetic phenomenon that occurs in nature and causes a selected trait to spread rapidly through a species via sexual reproduction over several generations. Gene drive works by increasing the likelihood that a modified gene will be inherited by its offspring. Normally, genes have a 50/50 chance of being inherited, but gene drive systems could increase that chance to upwards of 99 percent. This means that over the course of several generations, a selected trait could become increasingly common within a specific species.

Researchers have been studying how to harness gene drives to solve some of society's most intractable problems for a long time. Public health and ecosystem conservation are two of the main areas where research has focused, although other uses are also possible.

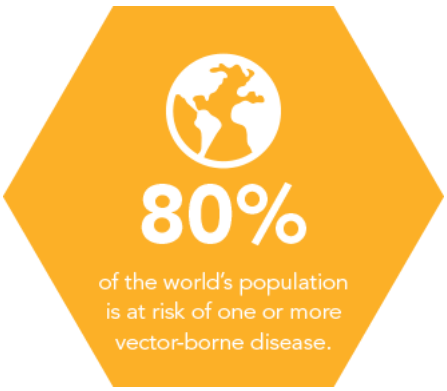
- **Public health:** Several proposals have been made which would use gene drive to limit the spread of diseases, particularly those spread by insect vectors, such as malaria, which affect several hundred million people a year. This could be done by inserting a trait a which makes the vector organism unable to host the pathogen, or one which affects the local population dynamics of the host organism to reduce that population.
- **Conservation:** Potential applications of gene drive in this field could enable the elimination of introduced invasive species which threaten native ecosystems or that carry infectious diseases that put the survival of other species at risk. This is for example being considered to manage rat

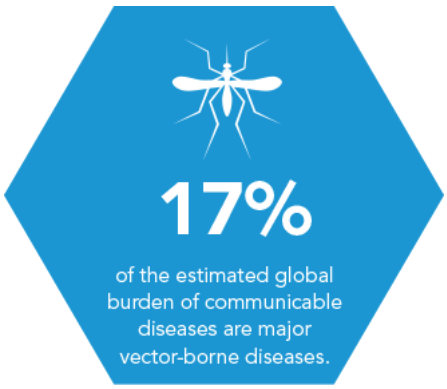
populations on islands, where as an invasive species, they undermine the survival of many local animals and birds and are the primary cause of extinctions.

WHY DOES GENE DRIVE RESEARCH MATTER?

Research on gene drive is exploring whether it is possible and appropriate to harness the potential of new technologies to offer complementary, sustainable and cost-effective strategies for controlling the transmission of vector-borne diseases and the population of introduced (invasive) and damaging species from sensitive native ecosystems. Both vector-borne diseases and invasive species are complex issues that existing approaches and methods have not yet been able to solve fully on their own. Their burden for society is enormous in terms of health, economic and social costs, making research into novel approaches critical.

Research into gene drive approaches is one of the many avenues being investigated to address these issues. Research is essential to help inform decision-making on any potential use and to map what could work, how, and to understand both risks and benefits. Research is here to provide evidence-based elements for policymakers and publics to consider when they assess each technology. Without research, we risk closing the door on important knowledge and possible new tools.





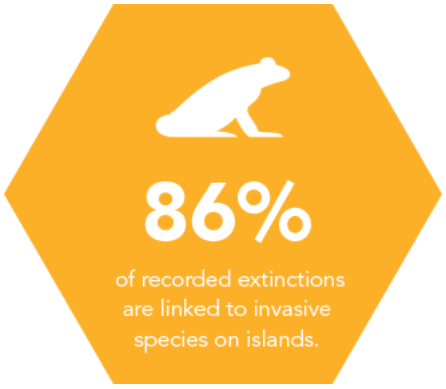
17%

of the estimated global burden of communicable diseases are major vector-borne diseases.

700

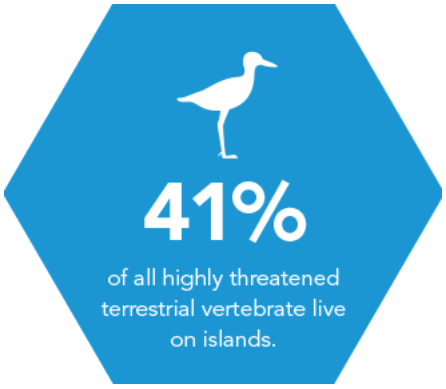
THOUSAND

lives are claimed by vector-borne diseases every year.



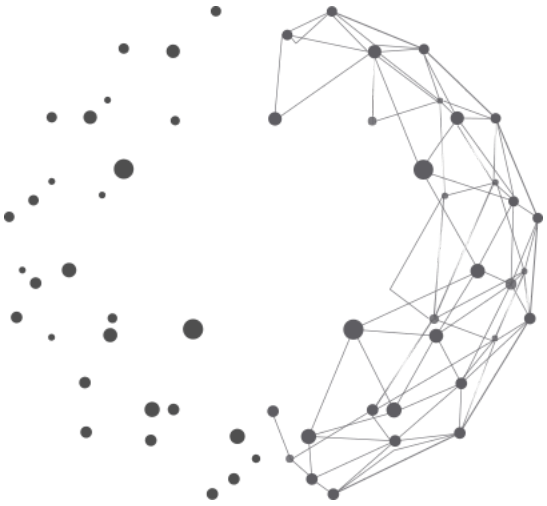
86%

of recorded extinctions are linked to invasive species on islands.



41%

of all highly threatened terrestrial vertebrate live on islands.



ABOUT US

The Outreach Network for Gene Drive Research's purpose is to raise awareness of the value of gene drive research for the public good. The network supports coordination among members, information sharing, and engagement with key stakeholders, in order to raise awareness of the value of gene drive research for the public good and of the need for continuous efforts in its advancement.

The Network's members are researchers and organisations working on gene drive research for public interest, organisations involved in outreach, stakeholder engagement and other relevant fields, as well as funders or supporters of these activities.

Current members of the Network are Island Conservation (https://www.islandconservation.org/) (a Genetic Biocontrol of Invasive Rodents (https://www.geneticbiocontrol.org/) partner), Target Malaria (http://www.targetmalaria.org/), the Bill & Melinda Gates Foundation (https://www.gatesfoundation.org/), Ifakara Health Institute (http://ihi.or.tz/), the UCI Malaria Initiative (http://engage.uci.edu/portfolio-items/uci-malaria-initiative/), McMaster Institute on Ethics & Policy for Innovation (https://iepi.humanities.mcmaster.ca/), Malaria No More (https://www.malarianomore.org/), the Pirbright Institute (https://www.pirbright.ac.uk/) and the Insect Genetics Group, Hebrew University of Jerusalem (https://www.papathanos.org/).

All Members commit to the Network's statement of mission and principle. The core activities of the network are supported by the Bill and Melinda Gates Foundation. All the Members contribute to the Network through their participation in its activities, and/or through financial contribution to support specific activities. General support to the Network is provided by a Secretariat managed by Emerging Ag Inc.

PUBLISHED IN: BLOG (/BLOG)

HIGH-TECH MAPS TO HELP FIGHT MALARIA WITH GREATER PRECISION (/BLOG/24-HIGH-TECH-MAPS-TO-HELP-FIGHT-MALARIA-WITH-GREATER-PRECISION)

04 JULY 2019

A new spatial and temporal modeling study captures the evolution of malaria incidence by region from 2000 to 2017 using higher-resolution maps. The findings will help decision-makers to identify with great precision the most critical regions, improving resource allocation, program planning and implementation, and monitoring initiatives. The research focused on malaria cases caused by the Plasmodium falciparum (Pf) parasite, the most virulent type of the disease, which is mainly concentrated in Sub-Saharan Africa.

Read more (/blog/24-high-tech-maps-to-help-fight-malaria-with-greater-precision)

RECENT

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High-tech maps to help fight malaria with greater precision (/blog/24-high-tech-maps-to-help-fight-malaria-with-greater-precision)

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25 JUNE 2019

Gene drive myth-busting: Gene drive equals CRISPR (/blog/21-gene-drive-myth-busting-gene-drive-equals-crispr)

18 JUNE 2019

Climate change to increase the likelihood of vector-borne diseases incidence (/blog/20-climate-change-to-increase-the-likelihood-of-vector-borne-diseases-incidence)

EVENTS

20-21 JUNE 2019

CRISPR Con: Conversations on Science, Society and the Future of Gene Editing (https://crisprcon.org)

Wageningen, The Netherlands

21-25 JULY 2019

29th International Congress for Conservation Biology (ICCB) (https://conbio.org/mini-sites/iccb-2019/registration/registration/)

Kuala Lumpur, Malaysia

27-30 AUGUST 2019

Post 2020 Biodiversity Framework – First Negotiation Session (https://www.cbd.int/doc/notifications/2019/ntf-2019-043-post2020-en.pdf)

Nairobi, Kenya

16-20 SEPTEMBER 2019

11th European Congress on Tropical Medicine and International Health (ECTMIH) (https://rstmh.org/events/11th-european-congress-tropical-medicine-and-international-health-ectmih)

Liverpool, UK

26-28 SEPTEMBER 2019

East African Research in Progress 2019 (https://rstmh.org/events/east-african-research-progress-2019?utm_source=RSTMH+newsletter&utm_campaign=e76e696727-Newsletter_Non_Members_26_April&utm_medium=email&utm_term=0_d3986a1cd6-e76e696727-185697877)

Moshi, Tanzania

13-14 NOVEMBER

Global Forum on Bioethics in Research (http://www.gfbr.global/news/call-now-open-gfbr-2019/)

Singapore

VIDEOS

Video: What's the state of play on gene drive research? (/resources-2/17-video-what-s-the-state-of-play-on-gene-drive-research)

Video: How can gene drive research be done safely and responsibly? (/resources-2/16-video-how-can-gene-drive-research-be-done-safely-and-responsibly)

Video: Why do we need to do stakeholder engagement for gene drive research? (/resources-2/15-video-why-do-we-need-to-do-stakeholder-engagement-for-gene-drive-research)

Video: Why does gene drive research matter? (/resources-2/14-video-why-does-gene-drive-research-matter)

UPDATES

11 JUNE

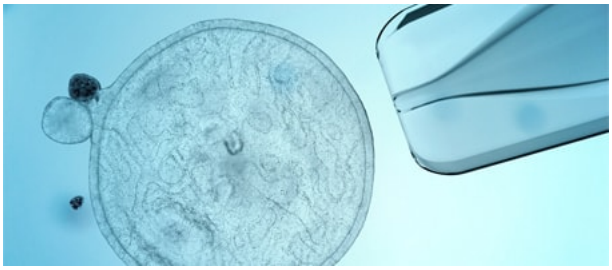
The Insect Genetics Group, Hebrew University of Jerusalem (HUJ) is now a member of the Network!

Find more about their research here (https://www.papathanos.org/).

03 JUNE

The Pirbright Institute is the latest organisation to join the Outreach Network!

Read more about their work here (https://www.pirbright.ac.uk/).



RESOURCES

31 MAY 2019

IUCN Report on Synthetic Biology Statement (/resources/27-iucn-report-on-synthetic-biology-statement)

30 NOVEMBER 2018

CBD COP14 Outcome Statement (/resources/25-cbd-cop14-outcome-statement)

20 NOVEMBER 2018

Gene Drive Research Factcheck (/resources/20-gene-drive-research-factcheck)

19 NOVEMBER 2018

Lettre ouverte sur la recherche de la technologie "gene drive" (/resources/19-lettre-ouverte-sur-la-recherche-de-la-technologie-gene-drive)

19 NOVEMBER 2018

Carta abierta sobre la investigación de la impulsión del gene (/resources/18-carta-abierta-sobre-la-investigacion-de-la-impulsion-del-gene)

13 NOVEMBER 2018

Open letter on Gene Drive Research (/resources/13-open-letter-on-gene-drive-research)

24 MAY 2018

Factsheet: Value of stakeholder engagement in gene drive research (/resources/10-factsheet-value-of-stakeholder-engagement-in-gene-drive-research-july2018)

09 MAY 2018

Factsheet: What's a Risk Assessment? (/resources/9-factsheet-what-s-a-risk-assessment-july2018)

09 MAY 2018

Factsheet: How is Gene Drive Research Regulated? (/resources/8-factsheet-how-is-gene-drive-research-regulated-july2018)

09 MAY 2018

Factsheet: What's a 'Gene Drive'? (/resources/7-factsheet-whats-a-gene-drive-july-2018-2)

CONTACT

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E-MAIL **(*)**

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MESSAGE

Message

SUBMIT

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