

## Newsletter 55: Coronavirus and Gene-Editing

Dear Reader,

The developments in early 2020 in China from what is being called the 2019 Novel Coronavirus (renamed COVIRD-9 by WHO) that evidently originated in the city of Wuhan and rapidly spread across China and into other countries have drawn worldwide scrutiny as to what was actually going on. The situation was enormously complicated by the apparent reluctance of the Chinese government initially to disclose all relevant facts of the situation until weeks into the epidemic crisis that had virtually shut down the entire economy of China by mid-February, 2020. A number of researchers pointed to the fact that examination of the data released by Beijing on the Wuhan coronavirus, COVIRD-19, indicated that it had been artificially manipulated with the addition of HIV elements in what is called “gain-of-function research,” a highly dangerous practice that the US Government banned in 2013 given the great risks. The changes to more common strains of coronavirus were reportedly done with what is known as gene-editing using CRISPR. Without being able to verify if this was the case with the original Wuhan virus, I have decided to make this compilation of a number of articles I have done in the past two years on the dangers in general of gene-editing. They take on a new significance in light of the 2020 China events.

I would ask you to take a minute also to please consider purchase of one or more of my books as well as a support via my PayPal on my [website](#) so that I am able to continue to offer my work open to all.

With my regards,  
William Engdahl

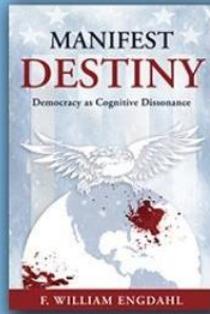
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## China's Hidden Economic Time Bomb

By F. William Engdahl

22 October 2019

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The China government statistical agency just released economic data showing the poorest GDP growth

## **Is Gene Editing the New Name for Eugenics?**

By F. William Engdahl

21 June, 2018

**A major new technology known as Gene Editing has gained significant attention in recent months. Its advocates claim it will revolutionize everything from agriculture production to disease treatment. None other than Bill Gates has just come out in an article in the US foreign policy magazine Foreign Affairs in praise of the promise of gene editing. Yet a closer investigation suggests that all is not so ideal with Gene Editing. New peer reviewed studies suggest it could cause cancer. The question is whether this technology, which is highly controversial, is little more than a stealth way to introduce GMO genetic manipulation by way of another technique.**

The scientific magazine, Nature Studies, has published two studies that suggest that gene-editing techniques may weaken a person's ability to fight off tumors, and "could give rise to cancer, raising concerns about for the safety of CRISPR-based gene therapies." The studies were done by Sweden's Karolinska Institute and by the pharmaceutical firm, Novartis. Cells whose genomes are successfully edited by CRISPR-Cas9 have the potential to seed tumors inside a patient the studies found. That could make some CRISPR'd cells ticking time bombs, according to researchers from Karolinska Institute and, in a separate study, by Novartis.<sup>i</sup>

The CEO of CRISPR Therapeutics, Sam Kulkarni, admitted that the results are "plausible." He added, "it's something we need to pay attention to, especially as CRISPR expands to more diseases."<sup>ii</sup> Given the stakes that is a notably nonchalant response.

### **Genes out of the bottle**

The issue of gene editing to cut or modify DNA of a plant, animal or potentially human beings is by no means mature let alone fully tested or proven safe as the two new studies suggest. CRISPR, far the most cited gene editing technology, was developed only in 2013. In 2015 at a London TED conference geneticist Jennifer Doudna presented what is known as CRISPR-Cas9, an acronym for "Clustered regularly-interspaced short palindromic repeats." It's a gene-editing platform using a bacterially-derived protein, Cas9 that supposedly allows genetic engineers to target and break the DNA double strand at a precise location within a given genome for the first time.

The technique also has significant problems. It has been shown repeatedly that only a small minority of cells into which CRISPR is introduced, usually by a virus, actually have their genomes edited as intended.

In China scientists used human embryos given by donors of embryos that could not have resulted in a live birth, to edit a specific gene. The results were a bad failure as the tested cells failed to contain the intended genetic material. Lead researcher Jungiu Huang told Nature. “That’s why we stopped. We still think it’s too immature.”<sup>iii</sup>

A newer form of gene editing known as gene drive, as I noted in an earlier article, has an alarming potential to become a Frankenstein monster. Gene Drive gene editing, which is being heavily funded by the Pentagon’s DARPA, aims to force a genetic modification to spread through an entire population, whether of mosquitoes or potentially humans, in just a few generations.

The scientist who first suggested developing gene drives in gene editing, Harvard biologist Kevin Esvelt has publicly warned that development of gene editing in conjunction with gene drive technologies have alarming potential to go awry. He notes how often CRISPR messes up and the likelihood of protective mutations arising, making even benign gene drives aggressive. He stresses, “Just a few engineered organisms could irrevocably alter an ecosystem.” Esvelt’s computer gene drive simulations calculated that a resulting edited gene “can spread to 99 percent of a population in as few as 10 generations, and persist for more than 200 generations.”<sup>iv</sup>

Despite such warnings and problems, the US Department of Agriculture has endorsed gene editing, without any special testing, for use in agriculture crops. The Department of Agriculture has decided that genetically edited plants are like plants with naturally occurring mutations and thus require no special regulations and raise no special safety concerns, despite all contrary indications. And the Pentagon’s DARPA is spending millions of dollars to research it.<sup>v</sup>

## **Enter Bill Gates**

Most recently the Microsoft founder Bill Gates, a long-time advocate of eugenics, population control and of GMO, has come out in a strong endorsement of Gene Editing. In an article in the May/June 2018 magazine of the New York Council on Foreign Relations, *Foreign Affairs*, Gates hails gene

editing technologies, explicitly CRISPR. In the article Gates argues that CRISPR and other gene-editing techniques should be used globally to meet growing demand for food and to improve disease prevention, particularly for malaria. “It would be a tragedy to pass up the opportunity,” he wrote. In point of fact, the Bill and Melinda Gates Foundation, which among other projects is working to spread GMO plants into African agriculture and which is a major shareholder of Monsanto, now Bayer AG, has financed gene editing projects for a decade.<sup>vi</sup>

Gates and his foundation are not at all neutral in the area of Gene Editing and definitely not in the related highly controversial Gene Drive applications. In December 2016 in Cancun Mexico at the UN Biodiversity Conference, more than 170 NGOs from around the world including the German Heinrich-Böll Stiftung, Friends of the Earth, La Via Campesina and others called for a moratorium on gene drive research.

However, inside the UN at their dedicated website the online discussion is dominated by something called the Ad Hoc Technical Expert Group on Synthetic Biology (AHTEG), a UN-approved “expert group” on synthetic biology. AHTEG is indirectly funded by the Bill & Melinda Gates Foundation through the PR company, Emerging Ag which wages an intense pro-Gene Drive lobby campaign within the UN. Emerging Ag has recruited some 60 biology researchers including from Bayer Crop Sciences to promote the high-risk gene drive technology. They advocate US-level non-regulation of gene editing and gene drive as does Gates, and they vigorously oppose any moratorium.<sup>vii</sup>

In his *Foreign Affairs* article Gates argues, “Gene editing to make crops more abundant and resilient could be a lifesaver on a massive scale...For a decade, the Bill & Melinda Gates Foundation has been backing research into the use of gene editing in agriculture.” He adds, without proof, “there is reason to be optimistic that creating gene drives in malaria-spreading mosquitoes will not do much, if any, harm to the environment.”<sup>viii</sup>

With the Bill & Melinda Gates Foundation, the USDA and the Pentagon DARPA all involved energetically advancing gene editing and especially the highly-risky Gene Drive applications in species such as mosquitoes, one has to ask is gene editing becoming the new name for eugenics in light of the fact that GMO technologies have been so vigorously opposed by citizen groups around the world. Honest scientific research is of course legitimate and necessary. But unregulated experimentation with technologies that could wipe out entire species is definitely not the same as planting a variety of hybrid corn.

## **China's Golem Babies: There is Another Agenda**

By F. William Engdahl

30 November, 2018

**The shocking news that a team of scientists working in China have managed to gene-edit the DNA of recently-born human twins to allegedly make them genetically immune to a HIV infection is more than bizarre and irresponsible. It suggests that certain researchers are making dangerous experiments to create ultimately the eugenics master dream—custom-designed humans. I call them Golem babies because when technology begins cutting and splicing the human DNA without certitude that the result will be stable or healthy to the human species it is not healthy.**

In medieval and ancient Jewish folklore a Golem is a being that is magically created entirely from inanimate matter such as mud. Golems have no soul. Similarly, the China experiment that claims the “first successful genetically modified humans,” when we go behind the surface stories, is alarming in the extreme.

### **HIV Immune?**

First of all the public story retailed by Chinese media and by the researcher, Chinese Professor He Jiankui, a Stanford University post-doctoral research graduate, doesn't ring honest. He, who is professor at Southern University of Science and Technology, claimed at a Human Genome Editing conference in Hong Kong on November 28, and on YouTube, that he had successfully modified two embryos produced from the sperm of an HIV-positive donor and implanted them in a healthy mother, who gave birth to twin girls earlier this month. He used the most common “gene-editing” tool, CRISPR-cas9, to deactivate a gene called CCR5 that acts as a ‘doorway’ to allow the HIV virus to enter a cell. He basically claimed to have created the world's first gene-edited humans, and announced that a second woman was pregnant with another of his gene-edited embryos.

Other scientists have severely criticized He for engaging in the human gene altering experiments. What He claims he did, to alter the DNA of human embryos, known as germ line gene editing, means the changes in those genes could be passed on and inherited by the next generations. Moreover, as several scientists involved in developing CRISPR have warned, He is in fact changing the

human gene pool. “We may not be able to see the impact of this until several generations later,” said Dennis Lo Yuk-ming, chairman of Chinese University’s Department of Chemical Pathology.

The scientist who first suggested developing gene drives in gene editing, Harvard biologist Kevin Esvelt, has publicly warned that development of gene editing, in conjunction with gene drive technologies, have alarming potential to go awry. He notes how often CRISPR messes up and the likelihood of mutations arising, making even benign gene drives aggressive. He stresses, “Just a few engineered organisms could irrevocably alter an ecosystem.” Esvelt’s computer gene drive simulations calculated that a resulting edited gene, “can spread to 99 percent of a population in as few as 10 generations, and persist for more than 200 generations.” Esvelt was discussing gene editing of mosquitoes. Now we are moving on to gene editing of human embryos.

Adding to the drama, at the Hong Kong gene editing conference where He proudly announced his results for the first time, Professor He refused to answer questions as to who paid for his work, or why he kept his work secret until after it was done. Chinese officials claim they had no knowledge of He’s project. There has been no independent confirmation of He’s claim, nor has he yet published in any scientific peer-reviewed journal on it.

Adding to the questions around the case, Dr Michael Deem, a bio-engineering professor at the esteemed Texas Rice University, has been revealed to have worked on the gene-editing project using humans together with He. He Jiankui got his PhD at Rice in 2010 and that year began co-authoring scientific papers with Deem. Deem also reportedly has a financial interest in two gene-editing companies that the enterprising He has set up in China. Dr. Deem, who also receives research money from the US government National Institutes of Health, did not inform Rice University of his involvement in what under current US law is illegal.

### **Eugenics and Unanswered Questions**

He has in the meantime been ordered to stop his human experiments with gene-editing, pending a government investigation. He declared that Chinese law, which is apparently vague on the issue, does not prohibit gene-editing with human subjects.

What is clear is that, as in many areas, China sees itself in a technology race with the West. As part of the 10 development priorities of its ambitious Made in China 2025 strategy, the government lists “Biotechnology” as a priority area.

Unfortunately, the government does not exclude proven harmful biotech areas such as Genetically Manipulated Organisms or GMOs. In 2017 the state-owned ChemChina took over the Swiss-based Syngenta, the world's largest agricultural chemical producer, and third largest in GMO seed patents. In the area of toxic plant herbicide, glyphosate, designated by an WHO agency a "probable carcinogen," Chinese companies make up by far the world's largest producers. In 2017, the global glyphosate production capacity was 1,065,000 tons. Of that was 380,000 tons by Monsanto and 685,000 tons of Chinese enterprises.

Now it appears that China is moving to become world leader in gene-editing. In January the US National Science Foundation released its annual report, Science and Engineering Indicators: 2018 report. It noted that while the USA still led in science and technology development, that "the US global share of S&T activities is declining as other nations -- especially China -- continue to rise." Gene editing and Artificial Intelligence were two areas of rapid Chinese development they cited.

What is not yet clear is whether certain US Government agencies such as the National Institutes of Health which funds Deem at Rice is quietly funding the He human gene-editing projects, taking advantage of the lax regulatory regime there. Or whether the spooky Pentagon research arm, DARPA, is involved.

As I noted in a previous article, DARPA's "Insect Allies" program "aims to disperse infectious genetically modified viruses that have been engineered to edit crop chromosomes directly in fields." This is known as "horizontal inheritance" as opposed to the dominant vertical method of GMO alteration that make laboratory-generated modifications into target species' chromosomes to create GMO plant varieties. The genetic alterations to the crops would be carried out by "insect-based dispersion" in free nature.

A group of European scientists strongly criticized the DARPA gene-editing Insect Allies project. They noted that no compelling reasons have been presented by DARPA for the use of insects as an uncontrolled means of dispersing synthetic viruses into the environment. Furthermore, they argue that the Insect Allies Program could be more easily used for biological warfare than for routine agricultural use. "It is very much easier to kill or sterilize a plant using gene editing than it is to make it herbicide or insect-resistant," according to Guy Reeves.

At this point it seems that the Chinese government is taking steps to rein in the rogue professor He and his research. What is not clear however, is whether this

is cosmetic in an attempt to diffuse enormous criticism of the He human gene-editing. Earlier this year the Wall Street Journal reported that according to review of Chinese scientific journal articles, since 2015 at least 86 people have been subject of gene-editing experiments. They reported that in 2015 it began when 36 patients with kidney, lung, liver and throat cancers had cells removed that allowed were then gene-edited and replanted in the human bodies to supposedly combat their cancer. The newspaper noted that none of the clinical trials have been formally published.

The entire field of gene-editing as with the Genome Project and GMO patented seeds, is a decades-long dream of some very influential actors such as the Rockefeller family and Bill Gates in what is called eugenics. The effort is based on fatally-flawed scientific reductionism that claims that the complexity of life can be reduced to a single gene that in turn can be modified at will.

In a recent post on the flaws of gene-editing, namely the assertion that thousands of diseases are caused by malfunction of one gene, a hypothesis yet to be proven, researcher Jon Rappoport, who sees gene-editing as “part and parcel of the trans-human agenda,” quotes Gregory Stock, former director of the program in Medicine, Technology, and Society at the UCLA School of Medicine: “Even if half the world's species were lost [during genetic experiments], enormous diversity would still remain. When those in the distant future look back on this period of history, they will likely see it not as the era when the natural environment was impoverished, but as the age when a plethora of new forms---some biological, some technological, some a combination of the two---burst onto the scene.”

Scientists, including some of the original inventors of gene-editing technologies, who call for a world moratorium on gene drives and gene-editing until the science can be conclusively proven safe, perhaps gain the ear of the world after the shocking Chinese human gene-editing reports. Something that Bill Gates and DARPA back can't be “all good.” In the classic Golem fable, much like Dr. Frankenstein's monster, the rabbi had to resort to trickery to deactivate it, whereupon it crumbled upon its creator and crushed him. Gene-editing of humans has eerie echoes of that Golem myth.

## Gene Edited Catastrophe in Brazil

By F. William Engdahl

1 October, 2019

**A British-American gene-editing company has released millions of genetically modified mosquitoes containing a dominant lethal gene, each week for 27 months in the Bahia, Brazil region in a test to see if the gene-edited mosquitoes would mate with local mosquitoes carrying Zika, malaria or other mosquito-borne diseases. A new study documents the alarming fact that following an initial reduction of the target population of mosquitoes, after some months the “population which had been greatly suppressed rebounded to nearly pre-release levels.” Scientists to date have no idea what dangers are presented by the new mutations. This once more highlights the dangers of uncontrolled gene-editing of species.**

According to a new published study in *Nature Reports* journal, genetically engineered mosquitoes produced by the biotech company, Oxitec, now part of the US company Intrexon, have escaped human control after trials in Brazil and are now spreading in the environment.

On paper the theory was brilliant. Strains of “yellow fever” male mosquitoes taken from Cuba and Mexico were altered using gene-editing to make it impossible for their offspring to survive. Oxitec then began a systematic release of tens of millions of the manipulated mosquitoes over more than two years in the the city of Jacobina in the region of Bahia in Brazil. The Oxitec theory was the altered mosquitoes would mate with normal females of the same type which carry infectious diseases like dengue fever, and kill them off in the process.

### **‘Unanticipated Outcome...’**

A team of scientists from Yale University and several scientific institutes in Brazil monitored the progress of the experiment. What they found is alarming in the extreme. After an initial period in which the target mosquito population markedly declined, after about 18 months the mosquito population recovered to pre-release levels. Not only that, the paper notes that some of the mosquitos likely have "hybrid vigor," in which a hybrid of the natural with the

gene-edited has created "a more robust population than the pre-release population" which may be more resistant to insecticides, in short, resistant "super mosquitoes."

The scientists note that, "Genetic sampling from the target population six, 12, and 27–30 months after releases commenced provides clear evidence that portions of the transgenic strain genome have been incorporated into the target population. Evidently, rare viable hybrid offspring between the release strain and the Jacobina population are sufficiently robust to be able to reproduce in nature..." They continue, "Thus, Jacobina *Ae. aegypti* are now a mix of three populations. It is unclear how this may affect disease transmission or affect other efforts to control these dangerous vectors." They estimate that between 10% and 60% of the Bahia natural *Ae. Aegypti* mosquitoes now had some gene-edited OX513A genome. They conclude that "The three populations forming the tri-hybrid population now in Jacobina (Cuba/Mexico/Brazil) are genetically quite distinct, very likely resulting in a more robust population than the pre-release population due to hybrid vigor."

This was not supposed to happen. Professor of ecology and evolutionary biology, Jeffrey Powell, senior author of the study, remarked on the findings: "The claim was that genes from the release strain would not get into the general population because offspring would die. That obviously was not what happened." Powell went on to note, "But it is the unanticipated outcome that is concerning."

### **A Gates Foundation Project**

The Brazil study deals a major alarm signal on the uncontrolled release of gene-edited species into nature. It calls to mind the horror plot of Michael Crichton's 1969 science fiction novel, *Andromeda Strain*. Only it is no novel.

The Oxitec mosquitoes were developed using a highly controversial form of gene-editing known as gene drive. Gene Drive, which is also being heavily funded by the Pentagon's DARPA, combined with CRISPR gene-editing, aims to force a genetic modification to spread through an entire population, whether of mosquitoes or potentially humans, in just a few generations.

The scientist who first suggested developing gene drives in gene-editing, Harvard biologist Kevin Esvelt, has publicly warned that development of gene

editing in conjunction with gene drive technologies has alarming potential to go awry. He notes how often CRISPR messes up and the likelihood of protective mutations arising, making even benign gene drives aggressive. He stresses, "Just a few engineered organisms could irrevocably alter an ecosystem." Esvelt's computer gene drive simulations calculated that a resulting edited gene "can spread to 99 percent of a population in as few as 10 generations, and persist for more than 200 generations." This is very much what has now been demonstrated in the mosquito experiment in Brazil.

Notable is the fact that the Oxitec Brazil mosquito experiment was funded by the Bill & Melinda Gates Foundation. In June, 2018 Oxitec announced a joint venture with the Gates Foundation, "to develop a new strain of Oxitec's self-limiting Friendly™ Mosquitoes to combat a mosquito species that spreads malaria in the Western Hemisphere." The Brazil results show the experiment is a catastrophic failure as the new strain is anything but self-limiting.

The Gates Foundation and Bill Gates have been backing development of the radical gene-editing technology and gene drive technology for more than a decade. Gates, a long-time advocate of eugenics, population control and of GMO, is a strong gene-editing promoter. In an article in the May/June 2018 magazine of the New York Council on Foreign Relations, *Foreign Affairs*, Gates hails gene editing technologies, explicitly CRISPR. In the article Gates argues that CRISPR and other gene-editing techniques should be used globally to meet growing demand for food and to improve disease prevention, particularly for malaria. In his article he adds, "there is reason to be optimistic that creating gene drives in malaria-spreading mosquitoes will not do much, if any, harm to the environment."

Every bit as alarming as the failure of the Brazil gene-editing mosquito experiment is the fact that this technology is being spread with virtually no prior health or safety testing by truly independent government institutions. To date the US Government relies only on industry safety assurances. The EU, while formally responsible to treat gene-edited species similarly to GMO plants, is reportedly trying to loosen the regulations. China, a major research center for gene-editing, has extremely lax controls. Recently a Chinese scientist announced an experiment in human gene-editing allegedly to make newborn twins resistant to HIV. Other experiments are proliferating around the world with gene-edited animals and even salmon. The precautionary principle has

been thrown to the winds when it comes to the new gene-editing revolution, not a reassuring situation.

Currently Oxitec, which denies that the Brazil results show failure, is now trying to get regulatory approval from the US Environmental Protection Agency to conduct a similar experiment with the same gene-edited species in Texas and Florida. One of the people involved in the attempt, Texan Roy Bailey, is a Washington lobbyist and close friend of Randal Kirk, the billionaire CEO of Intrexon, owner of Oxitec. Bailey is also a major Trump fundraiser. Let's hope that regulatory prudence and not politics decide the outcome.

## **Are Gene Edited Cows or Humans What We Really Need?**

By F. William Engdahl

17 August, 2019

**Scientists using the “second generation” of genetic manipulation technology have used gene-editing to alter the DNA of breed of cattle so that they supposedly do not grow horns. At around the same time another group of scientists claim to have injected human cells into monkeys to create chimeras, as in the ancient Greek myths of beings part lion, part snake. Earlier this year a group of Chinese researchers claimed to have deliberately gene-edited monkey clones with a mental disturbance. What few realize is that all this is taking place almost entirely without any serious health and safety regulation. Is this what mankind really needs at this juncture?**

### **Gene-edited hornless cows**

Scientists at the biotech company Recombinetics have filed a patent on cattle it has genetically engineered to not grow horns using gene-editing methods. They claimed the process to be safe and effective. However tests by scientists at the US Food and Drug Administration revealed that the CRISPR gene-editing process resulted in “unexpected alterations” of the genome, including “complex genomic rearrangements at or near the target site in 34 mammalian genome editing experiments.”

The FDA researchers found gene-editing errors in the genome of the animals that were being overlooked. They identified major unintended effects. The gene scissors used, known as TALENs, are often described as highly precise. However, the FDA research showed that apart from the desired gene sequences being inserted into the genome, DNA originating from genetically engineered bacteria used in the process was also inserted. Specifically, they found presence of unintended antibiotic resistance genes in the gene-edited cattle. Recombinetics reports that it is also developing a precision gene-editing breeding method to eliminate the need to castrate pigs. Unintended effects?

### **Human Monkey Brain?**

In another recent application of the gene-editing technology, an international group of scientists working in China have used gene-editing to produce human-monkey chimeras. According to the Spanish paper, *El País*, a team of researchers led by Prof Juan Carlos Izpisua Belmonte from the Salk Institute in the USA have produced monkey-human chimeras. The report says that the research was conducted in China “to avoid legal issues.” That should give pause.

Belmonte’s team states that the research is aimed at solving the problem of lack of organ donors as well as organ transplant rejection. Belmonte apparently has managed to produce both pig embryos and sheep embryos which contain human cells. They took cells from an adult human and reprogrammed them to become stem cells, which can give rise to any type of cell in the body. They are then introduced into the embryo of another species, such as the monkey or sheep or pigs.

Commenting on the implications of using gene-editing to produce human-animal chimeras, Prof Robin Lovell-Badge, a biologist from London’s Francis Crick Institute admits potential problems: “How do you restrict the contribution of the human cells just to the organ that you want to make?” he said. “If that is a pancreas or a heart or something, or kidney, then that is fine, if you manage to do that. [But] if you allow these animals to go all the way through and be born, if you have a big contribution to the central nervous system from the human cells, then that obviously becomes a concern.”

Other controversial China CRISPR gene-editing experiments have involved adding human brain genes, MCPH1, or microcephalin to monkeys. The gene-editing scientist, Bing Su, claimed, based on very small test results, that the monkeys seemed to be “smarter.” Bing Su and collaborators at the Yunnan Key Laboratory of Primate Biomedical Research exposed monkey embryos to a virus carrying the human version of microcephalin. They generated 11 monkeys, five of which survived to take part in a battery of brain measurements. The monkeys each have between two and nine copies of the human gene in their bodies. University of Colorado geneticist, James Sikela is critical: “The use of transgenic monkeys to study human genes linked to brain evolution is a very risky road to take.”

These are only several of the more alarming recent experiments using gene-editing CRISPR. The significant problem is that there is no scientific neutral oversight as to what experiments are being done. Because CRISPR requires very little relative investment in technology, it can be widely used even by irresponsible experimenters.

### **CRISPR Dangers**

CRISPR is defined as a “RNA-guided gene-editing platform that makes use of a bacterially-derived protein (Cas9) and a synthetic guide RNA to introduce a double strand break at a specific location within the genome.” The widespread experimenting with CRISPR-CAs9, the currently most widely used, has only been around since about 2015. Geneticists back in the 1970’s were restricted to costly labs using highly trained scientists and strict controls. With CRISPR gene editing, the process is extraordinarily cheap and seemingly easy to use. As one critic described it, “anyone can buy some CAS9 for a few hundred bucks, any halfway decent lab can use it to alter the DNA of anything...We might be able to wipe out entire species on a whim ...”

Potentially CRISPR gene-editing technology might enable positive change as well, such as treatments for genetic diseases; altering the germline of humans, animals, and other organisms; and modifying the genes of food crops for positive traits. We don’t know at this point. Yet the degree of unbiased scientific and government oversight over use of CRISPR is appalling.

### **Lack of Regulatory Oversight**

In 2018 European Court of Justice ruled that organisms that arise from a new technique called directed mutagenesis (gene-editing) are GMOs as defined by the EU GMO Directive. As such they should be regulated in the same strict way as GMOs produced in the EU using older techniques. The ruling was greeted as a sane, rational step to insure the health and safety of people and the planet is priority.

The interests backing CRISPR and other gene-editing, were not pleased. However, immediately the ECJ ruling was attacked as a departure from “science based decision making” and “backward looking and hostile to progress,” even though the judges carefully consulted a variety of expert scientists. The powerful GMO industry lobby has organized an effort to have

the new EU Commission create “a new legal regulatory framework for these new techniques,” one that is far less restrictive we can be sure.

In the US where Monsanto and the GMO industry has succeeded in creating effectively no government regulation of GMO plants such as corn or soybeans or cotton, the biotech industry has been more successful. The USDA recently proposed excluding the new gene-editing technologies such as CRISPR from in effect any regulation. This ignores the purpose of such regulation which is to hold the health and safety of the individual and of the environment paramount to any potential marketing gains from easy regulation. It is the well-established Precautionary Principle. That principle holds that government has a social responsibility to protect the public from exposure to harm, when scientific investigation has found a plausible risk. The onus of proof is on the GMO industry not the public. Just because they call their work “biotech” does not axiomatically mean that it is good for us. That we must carefully evaluate, most especially in a field such as gene-editing with the potential to “wipe out entire species on a whim ...”

## **Why Is Pentagon Weaponizing Insects?**

By F. William Engdahl

26 October, 2018

**There is strong evidence that the Pentagon, through its research and development agency, DARPA, is developing genetically modified insects that would be capable of destroying agriculture crops of a potential enemy. The claim has been denied by DARPA, but leading biologists have sounded the alarm on what is taking place using new “gene-editing” CRISPR technology to in effect weaponize insects. It’s like a 21<sup>st</sup> Century update of the Biblical plague of locusts, only potentially far worse.**

The Pentagon Defense Advanced Research Projects Agency, DARPA, is funding a program with the bizarre name “Insect Allies.” Dr. Blake Bextine of DARPA describes the program as “leveraging a natural and efficient two-step delivery system to transfer modified genes to plants: insect vectors and the plant viruses they transmit.” DARPA claims the program is to provide “scalable, readily deployable, and generalizable countermeasures against potential natural and engineered threats to the food supply with the goals of preserving the US crop system.” Check the language: scalable, readily deployable...

Under the DARPA project, Genetic Alteration Agents or viruses will be introduced into the insect population to directly influence the genetic makeup of crops. DARPA plans to use leaf hoppers, white flies, and aphids to introduce select viruses into crops. Among other dubious claims they say it will help farmers combat “climate change.” What no one can answer, especially as neither the Pentagon nor the US FDA are asking, is how will the genetically engineered viruses in the insects interact with other microorganisms in the environment? If crops are constantly being inundated by genetically modified viruses, how could this could alter the genetics and immune systems of humans who depend on the crops?

### **Bio-warfare alarm**

Since most of the present US food supply is contaminated with toxic Roundup and other herbicides and pesticides along with GMO plants, one might doubt the honesty of the Pentagon statements of concern for the present US crop system. A group of European scientists have published a scientific paper in the

October 5 issue of *Science* magazine, whose lead author is Dr. Guy Reeves of the Max Planck Institute for Evolutionary Biology, Plön, Germany.

The paper notes that the DARPA “Insect Allies” program, “aims to disperse infectious genetically modified viruses that have been engineered to edit crop chromosomes directly in fields.” This is known as “horizontal inheritance,” as opposed to the dominant vertical method of GMO alteration that make laboratory-generated modifications into target species' chromosomes to create GMO plant varieties. The genetic alterations to the crops would be carried out by “insect-based dispersion” in free nature.

The European scientists point out that no compelling reasons have been presented by DARPA for the use of insects as an uncontrolled means of dispersing synthetic viruses into the environment. Furthermore, they argue that the Insect Allies Program could be more easily used for biological warfare than for routine agricultural use. "It is very much easier to kill or sterilize a plant using gene editing than it is to make it herbicide or insect-resistant," according to Guy Reeves at the Max Planck Institute.

The *Science* article points out that there has been no scientific discussion, let alone oversight, of the safety of such methods of gene-editing in open fields or even whether there are any benefits at all. The US Department of Agriculture flatly rejects any health or safety testing of gene-edited plants or insects. “As a result, the program may be widely perceived as an effort to develop biological agents for hostile purposes and their means of delivery, which—if true—would constitute a breach of the Biological Weapons Convention (BWC).” So far \$27 million US taxpayer dollars have been spent on “Insect Allies.”

### **Unstable technology**

Though details are not available, it is most certain that the Insect Allies gene-editing project with CRISPR-Cas tools utilizes what is called “gene drive.” Gene Drive which is also being heavily funded by the Pentagon’s DARPA, with gene-editing, aims to force a genetic modification to spread through an entire population, whether of mosquitoes or potentially humans, in just a few generations.

The scientist who first suggested developing gene drives in gene editing, Harvard biologist Kevin Esvelt, has publicly warned that development of gene editing in conjunction with gene drive technologies has alarming potential to go awry. He notes how often CRISPR messes up and the likelihood of protective mutations arising, making even benign gene drives aggressive. He stresses,

“Just a few engineered organisms could irrevocably alter an ecosystem.”  
Esvelt’s computer gene drive simulations calculated that a resulting edited gene “can spread to 99 percent of a population in as few as 10 generations, and persist for more than 200 generations.”

Despite what Bill Gates, a major funder of gene-editing, may claim, gene-editing is not a precise technology in any sense. In China scientists used human embryos given by donors of embryos that could not have resulted in a live birth, to edit a specific gene. The results were a bad failure, as the tested cells failed to contain the intended genetic material. Lead researcher Jungiu Huang told *Nature*. “That’s why we stopped. We still think it’s too immature.”

### **Georgia Bioweapons Lab for Insect Allies?**

Are there mad scientists at DARPA or other agencies of the US government preparing to unleash deadly new forms of bio-weapon agents on adversaries such as Russia, today the world’s most important grain producer and a country whose crops are by law GMO-free? Or against China, or Iran or India...?

A series of recent reports in Russian and western media has recently put the spotlight on a high-security Pentagon-financed bio-lab near the Tbilisi Airport in Georgia, adjacent to Russia. The lab, the Richard G. Lugar Center for Public Health Research, a \$350 million facility, according to Georgian eyewitness reports, is built to what’s called Bio-Safety Level III standards, which means it can handle all but a handful of the most dangerous known microbes, including anthrax and the bacteria that causes bubonic plague. The Lugar center is staffed by scientists from the US Army Medical Research and Material Command.

Earlier this year Georgia’s former state security minister, Igor Giorgadze, gave a press interview in Moscow in which he said he had evidence confirming the center staged risky experiments in which a number of people died. He shared his evidence with the relevant Russian authorities.

All this reads like a chapter from the 1969 Robert Crichton science-fiction novel *Andromeda Strain*, only it’s not science fiction. The EU courts have ruled that gene-editing must be regulated as another form of GMO or genetic modified organisms. The US has refused regulations of any sort. It’s not difficult to believe that the people who tear up the 1987 Intermediate Nuclear Forces treaty and impose repeated sanctions on Russian officials and industry would be tempted to unleash or threaten to unleash a terrifying new bio-weapon

that, via billions of gene-edited virus-infected insects, would destroy Russia's vital breadbasket, all in the name of "world peace."

Is the Pentagon through DARPA engaged in "dual use," research by developing a bio weapon under the guise of agricultural advancement? There are those who would say, "Yes, but nobody in their right mind would risk what could be an irrevocable alteration of our ecosystem." But, as one biophysicist remarked in connection with GMO, there are some people not in their right mind..."

