ARE GENETICALLY MODIFIED FOODS AND MEDICINES A CRIME AGAINST HUMANITY?

AGROBACTERIUM

“Agrobacterium is a genus of Gram-negative bacteria established by H. J. Conn that uses horizontal gene transfer to cause tumors in plants. Agrobacterium tumefaciens is the most commonly studied species in this genus. Agrobacterium is well known for its ability to transfer DNA between itself and plants, and for this reason it has become an important tool for genetic engineering.”
https://en.wikipedia.org/wiki/Agrobacterium

AGROBACTERIUM: A POTENT HUMAN PATHOGEN

“Agrobacterium is a plant pathogen, which is able to produce several kinds of diseases in various plant species such as crown gall disease and hairy root disease. The crown gall disease and hairy root diseases develop when a segment of the bacterial DNA is transferred into the plant cell and subsequently becomes integrated into the plant genome. Historically, this transfer has taken place only in plants. There is an assumption that Agrobacterium, a commonly used gene transfer vector for plants, cannot infect animal cells; however, this has been proved wrong and certain kinds of human diseases have been identified. Increasing evidence indicates that, under laboratory conditions,Agrobacterium is able to transfer its DNA into numerous and diverse non plant eukaryotic species, such as fungi and yeast, as well as human cultured cells. Agro-bacterium is responsible for opportunistic infections in humans with weakened immune systems. It is also found to be responsible for producing poisonous hydrogen sulfide(H2S) gas, sepsis, monoarticular arthritis, bacteraemia, cancer, Morgellons disease and so on, in humans.”
https://www.researchgate.net/publication/271656390_Agrobacterium_a_potent_human_pathogen

AGROBACTERIUM-MEDIATED PLANT TRANSFORMATION (GENETIC MODIFICATION)

“Plant genetic transformation heavily relies on the bacterial pathogen Agrobacterium tumefaciens as a powerful tool to deliver genes of interest into a host plant.”
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6501860

GENETIC MANIPULATION AND TRANSFORMATION METHODS FOR ASPERGILLUS SPP.

“Species of the genus Aspergillus are widely distributed among natural environments and have several effects on humans. More than 300 species have been identified to date, of which several strains also have detrimental or beneficial effects for humans. For example, Aspergillus fumigatus and other human pathogenic Aspergillus species cause aspergillosis, including invasive aspergillosis, chronic pulmonary aspergillosis, and allergic bronchopulmonary aspergillosis. Several fungi (A. flavus, A. parasiticus, and A. ochraceus) infect agricultural crops during the harvest or post-harvest stages, and spoil crops or produce detrimental secondary metabolites in them, called mycotoxins, causing mycotoxin contamination. Although Aspergillus spp. have detrimental effects on humans, these species are also beneficial for the food and pharmaceutical industries. A. niger and A. oryzae serve as factories that produce the organic acids and enzymes that are required for various industries. For the food industry, generally recognized as safe fungi are used in the preparation of traditional fermented foods. Many

researchers are investigating the development of novel fungal strains, heterologous expression systems, and novel secondary metabolites through advanced genetic manipulation techniques because of the usefulness of these fungi."
https://www.tandfonline.com/doi/full/10.1080/12298093.2020.1838115

ASPERGILLUS - INFECTIOUS SUBSTANCES - PATHOGEN SAFETY DATA - GOVERNMENT OF CANADA

"HAZARD IDENTIFICATION

PATHOGENICITY/TOXICITY: Aspergillus spp. includes many species, about 40 of which have been implicated in human or animal infections. Aspergillosis is a common term used to describe infections caused by different species of Aspergillus. Most cases of aspergillosis are caused by A. fumigatus, with A. flavus and A. niger being the second most common pathogenic Aspergillus spp. worldwide. Diseases caused by Aspergillus spp. include clinical allergies (allergic bronchopulmonary aspergillosis, rhinitis, Farmers's lung), superficial and local infections (cutaneous infections, otomycosis, tracheobronchitis), infections associated with damaged tissue (aspergilloma, osteomyelitis), and invasive pulmonary and extrapulmonary infections. Invasive infections due to Aspergillus spp. occur mainly in immunocompromised individuals and are the most severe forms of infections caused by Aspergillus spp. Invasive aspergillosis is most commonly caused by A. fumigatus, but other species such as A. flavus, A. nidulans, and A. terreus have also been reported to cause invasive infections. Invasive infections primarily involve the sino-pulmonary tract, with lung being the most common site of invasion. Clinical signs suggestive of invasive sinusitis include fever, facial pain, headache, asymmetric facial swelling, epistaxis, proptosis, cranial nerve abnormalities, ischemia of the palate, and bone erosion. Fever, cough, and dyspnea are the most common but non-specific symptoms of invasive pulmonary aspergillosis. Vascular invasion may also occur and may manifest as pleural chest pain. If left untreated, hematogenous dissemination involving any organ may occur. The most serious condition is the involvement of the CNS, leading to seizures or stroke.

EPIDEMIOLOGY

Aspergillus spp. are found worldwide, and widely distributed in the environment. Aspergillus spp. are rare causes of disease in humans, and occur primarily in immunocompromised individuals. Invasive infections caused by Aspergillus spp. have been associated with high rates of morbidity and mortality especially in immune compromised individuals such as transplant patients. In the United States, the number of aspergillosis related deaths in immunocompromised individuals increased from 0.04 deaths per 100,000 people in 1980 to 0.15 deaths per 100,000 people in 1997 Footnote5. The incidence of invasive Aspergillus in patients with acute leukemia was reported to be 12.7 %, with a death rate of 13% in the year 2006 in United States. Compared to 2003, the mortality associated with invasive aspergillosis in acute leukemia patients has decreased from 24%, and the incidence has increased from 5.8%.

HOST RANGE: Humans, cows, dolphins, birds, and horses.

MODE OF TRANSMISSION: Inhalation of airborne conidia, through contaminated water (exposure to conidia during showering), and nosocomial infections (hospital fabrics and plastics may serve as importance source of Aspergillus spp.)"
https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/aspergillus.html

GENETICALLY MODIFIED '*VIRUS*'

"A genetically modified virus is a virus that has been altered or generated using biotechnology methods, and remains capable of infection. Genetic modification involves the directed insertion, deletion, artificial synthesis or change of nucleotide bases in viral genomes. Genetically modified viruses are mostly generated by the insertion of foreign genes intro viral genomes for the purposes of biomedical, agricultural, bio-control, or technological objectives. The terms genetically modified virus and genetically engineered virus are used synonymously.

In 1972, the earliest report of the insertion of a foreign sequence into a viral genome was published, when Paul Berg used the EcoRI restriction enzyme and DNA ligases to create the first ever recombinant DNA molecules. This was achieved by joining DNA from the monkey SV40 virus with that of the lambda virus. However, it was not established that either of the two viruses were capable of infection or replication.

In 1974, the first report of a genetically modified virus that could also replicate and infect was submitted for publication by Noreen Murray and Kenneth Murray. Just two months later in August 1974, Marjorie Thomas, John Cameron and Ronald W. Davis submitted a report for publication of a similar achievement.

Collectively, these experiments represented the very start of the development of what would eventually become known as biotechnology or recombinant DNA methods.

Gene therapy uses genetically modified viruses to deliver genes that can cure diseases in human cells.These viruses can deliver DNA or RNA genetic material to the targeted cells. Gene therapy is also used by inactivating mutated genes that are causing the disease using viruses.

Viruses that have been used for gene therapy are, adenovirus, lentivirus, retrovirus and the herpes simplex virus. The most common virus used for gene delivery come from adenoviruses as they can carry up to 7.5 kb of foreign DNA and infect a relatively broad range of host cells, although they have been known to elicit immune responses in the host and only provide short term expression. Other common vectors are adeno-associated viruses, which have lower toxicity and longer term expression, but can only carry about 4kb of DNA. Herpes simplex viruses is a promising vector, have a carrying capacity of over 30kb and provide long term expression, although it is less efficient at gene delivery than other vectors. The best vectors for long term integration of the gene into the host genome are retroviruses, but their propensity for random integration is problematic. Lentiviruses are a part of the same family as retroviruses with the advantage of infecting both dividing and non-dividing cells, whereas retroviruses only target

dividing cells. Other viruses that have been used as vectors include alphaviruses, flaviviruses, measles viruses, rhabdoviruses, Newcastle disease virus, poxviruses, and picornaviruses.

Most vaccines consist of viruses that have been attenuated, disabled, weakened or killed in some way so that their virulent properties are no longer effective. Genetic engineering could theoretically be used to create viruses with the virulent genes removed. In 2001, it was reported that genetically modified viruses can possibly be used to develop vaccines against diseases such as, AIDS, herpes, dengue fever and viral hepatitis by using a proven safe vaccine virus, such as adenovirus, and modify its genome to have genes that code for immunogenic proteins that can spike the immune systems response to then be able to fight the virus. Genetic engineered viruses should not have reduced infectivity, invoke a natural immune response and there is no chance that they will regain their virulence function, which can occur with some other vaccines. As such they are generally considered safer and more efficient than conventional vaccines, although concerns remain over non-target infection, potential side effects and horizontal gene transfer to other viruses. Another approach is to use vectors to create novel vaccines for diseases that have no vaccines available or the vaccines that are do not work effectively, such as AIDS, malaria, and tuberculosis. Vector-based vaccines have already been approved and many more are being developed.

In Spain and Portugal, by 2005 rabbits had declined by as much as 95% over 50 years due diseases such as myxomatosis, rabbit haemorrhagic disease and other causes. This in turn caused declines in predators like the Iberian lynx, a critically endangered species. In 2000 Spanish researchers investigated a genetically modified virus which might have protected rabbits in the wild against myxomatosis and rabbit haemorrhagic disease. However, there was concern that such a virus might make its way into wild populations in areas such as Australia and create a population boom. Rabbits in Australia are considered to be such a pest that land owners are legally obliged to control them.

Genetically modified viruses that make the target animals infertile through immunocontraception have been created as well as others that target the developmental stage of the animal. There are concerns over virus containment and cross species infection.

Since 2009 genetically modified viruses expressing spinach defensin proteins have been field trialed in Florida (USA). The virus infection of orange trees aims to combat citrus greening disease, that had reduced orange production in Florida 70% since 2005. A permit application has been pending since February 13, 2017 (USDA 17-044-101r) to extend the experimental use permit to an area of 513,500 acres, this would make it the largest permit of this kind ever issued by the USDA Biotechnology Regulatory Services.

In 2016 DARPA, an agency of the U.S. Department of Defense, announced a tender for contracts to develop genetically modified plant viruses for an approach involving their dispersion into the environment using insects. The work plan stated:

“Plant viruses hold significant promise as carriers of gene editing circuitry and are a natural partner for an insect-transmitted delivery platform.”

The motivation provided for the program is to ensure food stability by protecting agricultural food supply and commodity crops:

"By leveraging the natural ability of insect vectors to deliver viruses with high host plant specificity, and combining this capability with advances in gene editing, rapid enhancement of mature plants in the field can be achieved over large areas and without the need for industrial infrastructure.”

Despite its name, the “Insect Allies” program is to a large extent a viral program, developing viruses that would essentially perform gene editing of crops in already-planted fields. The genetically modified viruses described in the work plan and other public documents are of a class of genetically modified viruses subsequently termed HEGAAs (horizontal environmental gene alteration agents). The Insect Allies program is scheduled to run from 2017 to 2021 with contracts being executed by three consortia. There are no plans to release the genetically modified viruses into the environment, with testing of the full insect dispersed system occurring in greenhouses (Biosafety level 3 facilities have been mentioned).

Concerns have been expressed about how this program and any data it generates will impact biological weapon control and agricultural coexistence, though there has also been support for its stated objectives.

In 2009, MIT scientists created a genetically modified virus has been used to construct a more environmentally friendly lithium-ion battery. The battery was constructed by genetically engineering different viruses such as, the E4 bacteriophage and the M13 bacteriophage, to be used as a cathode. This was done by editing the genes of the virus that code for the protein coat. The protein coat is edited to coat itself in iron phosphate to be able to adhere to highly conductive carbon-nanotubes. The viruses that have been modified to have a multifunctional protein coat can be used as a nano-structured cathode with causes ionic interactions with cations. Allowing the virus to be used as a small battery. Angela Blecher, the scientist who led the MIT research team on the project, says that the battery is powerful enough to be used as a rechargeable battery, power hybrid electric cars, and a number of personal electronics. While both the E4 and M13 viruses can infect and replicate within their bacterial host, it unclear if they retain this capacity after being part of a battery.

The National Institute of Health declared a research funding moratorium on select Gain-of-Function virus research in January 2015. In January 2017, the U.S. Government released final policy guidance for the review and oversight of research anticipated to create, transfer, or use enhanced potential pandemic pathogens (PPP). Questions about a potential escape of a modified virus from a biosafety lab and the utility of dual-use-technology, dual use research of concern (DURC), prompted the NIH funding policy revision.

A scientist claims she was infected by a genetically modified virus while working for Pfizer. In her federal lawsuit she says she has been intermittently paralyzed by the Pfizer-designed virus. "McClain, of Deep River, suspects she was inadvertently exposed, through work by a former Pfizer colleague in 2002 or 2003, to an engineered form of the lentivirus, a virus similar to the one that can lead to acquired immune deficiency syndrome, or AIDS." The court found that McClain failed to demonstrate that her illness was caused by exposure to the lentivirus, but also that Pfizer violated whistleblower protection laws."
https://en.wikipedia.org/wiki/Genetically_modified_virus

RISK FROM GMO's DUE TO HORIZONTAL GENE TRANSFER
"Horizontal gene transfer (HGT) is the stable transfer of genetic material from one organism to another without reproduction or human intervention. Transfer occurs by the passage of donor genetic material across cellular boundaries, followed by heritable incorporation to the genome of the recipient organism. In addition to conjugation, transformation and transduction, other diverse mechanisms of DNA and RNA uptake occur in nature. The genome of almost every organism reveals the footprint of many ancient HGT events. Most commonly, HGT involves the transmission of genes on viruses or mobile genetic elements. HGT first became an issue of public concern in the 1970s through the natural spread of antibiotic resistance genes amongst pathogenic bacteria, and more recently with commercial production of genetically modified (GM) crops. However, the frequency of HGT from plants to other eukaryotes or prokaryotes is extremely low. The frequency of HGT to viruses is potentially greater, but is restricted by stringent selection pressures. In most cases the occurrence of HGT from GM crops to other organisms is expected to be lower than background rates. Therefore, HGT from GM plants poses negligible risks to human health or the environment."
https://pubmed.ncbi.nlm.nih.gov/18801324/

MEDICAGO - GOVERNMENT OF CANADA - VACCINES
A biopharmaceutical company headquartered in Quebec City, Canada, announced that it has reached an agreement to supply the Government of Canada with up to 76 million doses of its vaccine against COVID-19, subject to Health Canada approval.

The government's press statement on October 23, 2020, indicated this purchase is enough to vaccinate 38 million people and is the first domestically developed vaccine candidate the Government of Canada has secured, that is targeted against the SARS-CoV-2 coronavirus.

"Access to safe and effective vaccines is critical for Canada, and the government is doing its part to help support innovative Canadian companies in performing the research needed to demonstrate that their products meet Health Canada's high safety, efficacy, and quality standards," added the Hon. Patty Hajdu, Minister of Health, in the press statement.

Medicago's plant-based platform produced its coronavirus Virus-Like Particle (VLP) vaccine. Medicago's plant-derived vaccine development differs because it uses living plants as bioreactors to produce a non-infectious particle that mimics the target virus, without the use of any live viruses.

Medicago's proprietary technology Proficia® uses N. benthamiana plants, which is the most widely used experimental host in plant virology, due mainly to the large number of viruses that can successfully infect it. Its weakened immune system, the result of natural genetic changes over millennia, means genetic material can be successfully hosted by the plant and not rejected.

Medicago stated on October 23, 2020, it plans to initiate Phase 2 clinical trials in November, and Phase 3 trials in December 2020.

Separately, the Canadian government is also providing up to $23.2 million in funding through the National Research Council of Canada Industrial Research Assistance Program to advance six COVID-19 vaccine candidates in various stages of clinical trials.

The Government of Canada has now signed agreements with Medicago, AstraZeneca, Sanofi and GlaxoSmithKline, Johnson & Johnson, Novavax, Pfizer, and Moderna. Agreements signed to date will secure access to up to 358 million doses of their different COVID-19 vaccine candidates.

As of October 23, 2020, there are (3) vaccine candidates under review by Canada.
https://www.precisionvaccinations.com/canada-purchase-home-grown-covid-19-vaccine

DR. THERESA TAM - MEDICAGO COVIFENZ
""I am pleased to see the first COVID-19 vaccine developed by a Canadian-based company added to Canada's COVID-19 vaccine portfolio. The authorization of the Medicago Covifenz vaccine provides another COVID-19 vaccine option for adults who have not yet been immunized against COVID-19 and who are unable or unwilling to receive an mRNA COVID-19 vaccine. We know from clinical trials that the Medicago vaccine has a good safety profile and provides protection against symptomatic COVID-19 disease. As with all vaccines, PHAC, Health Canada and NACI will continue to monitor the safety and effectiveness of the Medicago vaccine as it is used more widely. I would like to thank NACI for continuing to provide expert and timely guidance on the use of COVID-19 vaccines in Canada. I encourage anyone who has not yet received a primary series of COVID-19 vaccines to get theirs now."
- Dr. Theresa Tam, Chief Public Health Officer."
https://www.canada.ca/content/dam/phac-aspc/documents/services/immunization/national-advisory-committee-on-immunization-naci/recommendations-use-medicago-covid-19-vaccine/recommendations-use-medicago-covid-19-vaccinesummary-march-11-2022.pdf

CANADA APPROVES MEDICAGO VACCINE
"The vaccine was approved for people who are 18 years of age and older. Its safety and effectiveness in people younger than 18 years of age have not yet been established.

Effectiveness
Clinical trials showed that beginning 1 week after the second dose, Medicago Covifenz® COVID-19 vaccine was:

71% effective in protecting trial participants aged 18 to 64 against COVID-19.
Effectiveness data supporting the authorization in the 65 years and older population is based on a comparison of immune responses in this age group to individuals aged 18 to 64 years. The data determined that the immune response to the vaccine for the 65 and older age group was comparable to the immune response of the 18 to 64 age group.

Dosage
The dosing schedule approved by Health Canada is to give 2 doses 21 days apart, based on evidence from clinical trials. Each dose contains 3.75 micrograms of virus-like particles (VLP) of SARS-CoV-2 spike (S) protein (original strain) and 0.25 millilitres of the AS03 adjuvant.

Your province or territory decides when people receive their doses of the vaccine.

These decisions are based on public health recommendations and the latest evidence.

Vaccine review, approval and monitoring
Health Canada's independent drug review process is recognized around the world for its high standards and rigor. Our decisions are based only on scientific and medical evidence showing that vaccines are safe and effective. The benefits must also outweigh any risks.

The Medicago Covifenz® COVID-19 vaccine was authorized on February 24, 2022, for use in Canada under the Food and Drug Regulations. The sponsor cancelled the authorization on March 31, 2023.

Find detailed technical information such as the product monograph and the regulatory decision summary:

Medicago Covifenz® vaccine regulatory information
https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/vaccines/medicago.html

MEDICAGO
"A research partnership was formed between Laval University and Agriculture Canada in 1997. This would go on to be incorporated in 1999 as Medicago, licensing that technology researched in the partnership, from Agriculture Canada and Université Laval.

In September 2013, Philip Morris International acquired a 40% stake in Medicago, the remaining 60% being acquired by Mitsubishi Tanabe Pharma Corporation and other Mitsubishi Group companies, in a joint purchase.

The company had a Phase III clinical trial underway in 2020 for its candidate to prevent seasonal influenza.

For its COVID-19 vaccine, Medicago grew its virus-like particles in the Australian weed, Nicotiana benthamiana. In July 2020, the company began a Phase I clinical trial on its candidate vaccine for COVID-19 disease, coVLP, which advanced to a Phase II-III trial in Canada and the United States during November 2020. The Canadian government invested $173 million into Medicago to support development of the Covifenz vaccine and help expand its production facility. In December 2021, the company announced that its CoVLP vaccine candidate exhibited 71% efficacy and no adverse effects in a multinational, Phase III clinical trial. In February 2022, Health Canada authorized use of CoVLP (brand name Covifenz) for preventing COVID-19 infection in adults 18 to 64 years old.

In July 2022, the Canadian federal government determined it would not consider buying the shares owned by Medicago's parent company, tobacco company Philip Morris International, to overcome the problem of the World Health Organization accepting any products from tobacco concerns.

In December 2022, Philip Morris was bought out by Mitsubishi, acquiring a 100% stake in the company."

"Due to substantial competition in the global vaccine market and low demand for Covifenz, Mitsubishi announced in February 2023 that Covifenz and Medicago, Inc. would be terminated." https://en.wikipedia.org/wiki/Medicago_Inc.

CoVLP
CoVLP (brand name Covifenz) was a COVID-19 vaccine developed by Medicago in Canada and GlaxoSmithKline (GSK). The product and Medicago, Inc. were owned by Mitsubishi who terminated the company and program in February 2023 due to high international market competition for COVID-19 vaccines.

It is a coronavirus virus-like particle vaccine grown in the Australian weed, Nicotiana benthamiana.

The Medicago method to manufacture CoVLP was a "molecular farming" technology regarded as rapid, low-cost, and safe. It was proposed specifically for production of COVID-19 vaccines.

In February 2022, Health Canada authorized use of CoVLP for preventing COVID-19 infection in adults 18 to 64 years old. The authorization stated there was an efficacy rate of 71% after two vaccinations against symptoms of COVID-19 disease and 100% efficacy against severe COVID-19 infections.
https://en.wikipedia.org/wiki/CoVLP

EVALUATION OF ADVERSE EFFECTS/EVENTS OF GENETICALLY MODIFIED FOOD CONSUMPTION
OBJECTIVE

“A systematic review of animal and human studies was conducted on genetically modified (GM) food consumption to assess its safety in terms of adverse effects/events to inform public concerns and future research.

CONCLUSION
Serious adverse events of GM consumption include mortality, tumour or cancer, significant low fertility, decreased learning and reaction abilities, and some organ abnormalities. Further clinical trials and long-term cohort studies in human populations, especially on GM food-related adverse events and the corresponding GM events, are still warranted. It suggests the necessity of labelling GM food so that consumers can make their own choice.”
https://enveurope.springeropen.com/articles/10.1186/s12302-021-00578-9

HYPHAL AND MYCELIAL CONSCIOUSNESS - THE FUNGAL MIND
“Sensitivity or irritability are not the same things as consciousness, but they are starting points in considering whether filamentous fungi have minds. We will begin this inquiry with single hyphae and move on to fungal colonies or mycelia. Hyphae are thin, pressurized tubes of cytoplasm adapted for invasive growth and feeding in solid materials. These microscopic threads elongate at their tips, where the exocytosis of thousands of vesicles per minute provides new membrane and cell wall components (Riquelme et al., 2018). The vesicles are produced by an endomembrane system that stretches along the hypha and they are guided by the cytoskeleton to a vesicle supply center (VSC) located close to the tip region. Vesicles move to the cell surface from this hub and new VSCs are organized behind the tip to support emerging branches. The sensitivity of the hypha is clear from the behavior of these VSCs, which are visible as clouds of vesicles called Spitzenkörpers in ascomycete and basidiomycete fungi (Riquelme and Sánchez-León, 2014). Spitzenkörpers form and dissolve as hyphae grow and stop growing, and variations in their size and position are correlated with changes in the rate of hyphal extension and the shape of the tip (Reynaga-Peña et al., 1997). There is nothing artificial about this intelligence. The continuous flow of information in the live cell would overwhelm the most complex robot.

Sensitivity is very evident when we manipulate the fungus in the lab. If the cell membrane is punctured with a glass micropipet, the hypha responds by mobilizing cytoplasmic vesicles to repair the leakage. When the hypha is sliced open with a scalpel blade, more radical repair mechanisms are deployed. Filamentous ascomycetes use organelles called Woronin bodies to seal-off hyphal compartments to prevent the whole hypha from rupturing and different defensive measures have evolved in other groups of fungi (Nguyen et al., 2021). These patching systems are comparable to blood-clotting mechanisms in animals.
https://www.sciencedirect.com/science/article/pii/S1878614621000246

MYCELIUM INTELLIGENCE
“Several studies have documented the memory capacity of Mycelial networks and their adaptability to specific environmental conditions. Mycelia have been specialized for different functions in various climates and develop symbiotic or pathogenic relationships with other organisms, such as the human pathogen Candida auris, which has developed a unique

approach of evading detection by human neutrophils through adaptive selection–a process of fungal learning and memory. Additionally, these functions can change based on the scale of the mycelia and nature of the symbiotic relationship; commensal and mutual relationships between fungi and plants form through a separate process known as mycorrhizal association, which are called mycorrhiza. Additionally, hyphal organization into mycelial networks can be deterministic for a variety of functions including biomass retention, water recycling, expansion of future hyphae on a resource efficient approach towards desired nutrient gradients, and the subsequent distribution of these resources across the hyphal network. On a macroscopic scale, many mycelia operate with a sort of hierarchy having a “trunk” or main mycelium, with smaller “branches” branching off. Some saprotrophic basidiomycetes are able to remember past decisions about directional nutrition gradients and will build future mycelium in that direction.

Current research on collective mycelial intelligence is limited, and while many studies have observed memory and the exchange of electric charge across mycelial networks, this is insufficient evidence to make conclusions about how sensory data is processed in these networks. However, some examples of increased thermal resistance in filamentous fungi suggest a power-law relationship for memory and exposure to a stimulus. Mycelia have also demonstrated the ability to edit their genetic structures within a lifetime due to antibiotic or other extracellular stressors, which can cause rapid acquisition of resistance genes, like those in C. auris. Additionally, plasmodial slime molds demonstrate a similar method of information sharing, as both mycelia and slime molds make use of cAMP molecules for aggregation and signaling.”

Mycelium (plural mycelia) is a root-like structure of a fungus consisting of a mass of branching, thread-like hyphae. Fungal colonies composed of mycelium are found in and on soil and many other substrates. A typical single spore germinates into a monokaryotic mycelium, which cannot reproduce sexually; when two compatible monokaryotic mycelia join and form a dikaryotic mycelium, that mycelium may form fruiting bodies such as mushrooms. A mycelium may be minute, forming a colony that is too small to see, or may grow to span thousands of acres as in Armillaria.

Through the mycelium, a fungus absorbs nutrients from its environment. It does this in a two-stage process. First, the hyphae secrete enzymes onto or into the food source, which break down biological polymers into smaller units such as monomers. These monomers are then absorbed into the mycelium by facilitated diffusion and active transport.”
https://en.wikipedia.org/wiki/Mycelium

MYCELIUM INFECTION
“1806 Mycelium infections, an epidemic that decimated a village in the south of France. The fungus grew into the bone, creating ossified structures that broke out of the skin to spread spores.

The only picture of Élisabeth Jourdain, one of the sole survivors of the 1806 Mycelium infections, taken ca. 1855. Élisabeth was fifteen when she was infected. Luckily, the disease reached equilibrium in her system. She survived, but it became a lifelong chronic condition.

https://valdevia.art/portfolio/mycelium-infection/
https://pubmed.ncbi.nlm.nih.gov/36986378/

QUORUM SENSING

“Quorum sensing (QS) is a mechanism of microbial communication dependent on cell density that can regulate several behaviors in bacteria such as secretion of virulence factors, biofilm formation, competence and bioluminescence. The existence of fungal QS systems was revealed ten years ago after the discovery that farnesol controls filamentation in the pathogenic polymorphic fungus Candida albicans. In the past decade, farnesol has been shown to play multiple roles in C. albicans physiology as a signaling molecule and inducing detrimental effects on host cells and other microbes. In addition to farnesol, the aromatic alcohol tyrosol was also found to be a C. albicans QS molecule (QSM) controlling growth, morphogenesis and biofilm formation. In Saccharomyces cerevisiae, two other aromatic alcohols, phenylethanol and tryptophol were found to be QSMs regulating morphogenesis during nitrogen starvation conditions. Additionally, population density-dependent behaviors that resemble QS have been described in several other fungal species. Although fungal QS research is still in its infancy, its discovery has changed our views about the fungal kingdom and could eventually lead to the development of new antifungal therapeutics.”
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4294699/

EFFECTS OF WI-FI RADIATION ON GERMINATION AND GROWTH OF BROCCOLI, PEA, RED CLOVER AND GARDEN CRESS SEEDLINGS: A PARTIAL REPLICATION STUDY

Background: This is a partial replication study of work conducted by high school students in Denmark as part of their science fair project. Objective: The purpose of this study is to determine whether radiation from a Wi-Fi router affects germination and growth of garden cress (Lepidium sativum), broccoli (Brassica oleracea), red clover (Trifolium pratense) and pea (Pisum sativum). Method: One set of seeds was placed in Petri plates in a germination chamber kept under controlled conditions and was exposed to microwave radiation generated by a Wi-Fi router (mean and maximum exposures 20–40 and 96 mW/m2 respectively). The other set of seeds was kept under identical conditions with no Wi-Fi router (reference) and with much lower microwave exposure (0.0001 mW/m2). Seedlings were harvested after one month and biomass (dry weight) was recorded. Results: The radiation from the Wi-Fi router did not affect germination of any of the species tested. However, there was a significant reduction in dry weight of the broccoli (86% of control) and peas (43% of control) exposed to Wi-Fi radiation at the end of the experiment ($p<0.01$). Wi-Fi exposure inhibited root growth of several species. It also caused root tips to turn brown and reduced root hairs of cress compared with the reference treatment. Broccoli seedlings closest to the Wi-Fi router grew away from the router; cress seedlings had larger leaves and were chlorotic compared with controls. Several small plants began to die and mould developed in those Petri plates. Conclusions: Radiation from Wi-Fi reduces root and shoot growth, contributes to chlorosis, alters size of leaves, and reduces fine root hairs in several on the species tested. **Radiation generated by a Wi-Fi router, at levels well below international guidelines for microwave radiation, adversely affects plant growth and may interfere with a plant's ability to protect itself from opportunistic mould.**
https://www.eurekaselect.com/article/75099

RADIOTROPHIC FUNGI
"Radiotrophic fungi are fungi that can perform the hypothetical biological process called radiosynthesis, which means using ionizing radiation as an energy source to drive metabolism. It has been claimed that radiotrophic fungi have been found in extreme environments such as in the Chernobyl Nuclear Power Plant.

Most radiotrophic fungi use melanin in some capacity to survive. The process of using radiation and melanin for energy has been termed radiosynthesis, and is thought to be analogous to anaerobic respiration. However, it is not known if multi-step processes such as photosynthesis or chemosynthesis are used in radiosynthesis or even if radiosynthesis exists in living organisms."
https://en.wikipedia.org/wiki/Radiotrophic_fungus

FUSARIUM INFECTION
Fusarium species cause a broad spectrum of infections in humans, including superficial, locally invasive, and disseminated infections. The clinical form of fusariosis depends largely on the immune status of the host and the portal of entry, with superficial and localized disease occurring mostly in immunocompetent patients and invasive and disseminated disease affecting immunocompromised patients. Risk factors for severe fusariosis include prolonged neutropenia and T-cell immunodeficiency, especially in hematopoietic stem cell transplant recipients with severe graft-versus-host disease. The most frequent presentation of disseminated fusariosis is

a combination of characteristic cutaneous lesions and positive blood cultures, with or without lung or sinus involvement. The prognosis is poor and is determined largely by degree of immunosuppression and extent of infection, with virtually a 100% death rate among persistently neutropenic patients with disseminated disease. These infections may be clinically suspected on the basis of a constellation of clinical and laboratory findings, which should lead to prompt therapy. Treatment options include the lipid formulations of amphotericin B, voriconazole, and posaconazole. Prevention of fusarial infection among high-risk patients should be considered.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2176050/

POST COVID CHRONIC GRANULOMATOUS

“In another hand, recent finding report that CD8+ mucosal activated invariant T (MAIT) cells might play a role in COVID-19 severity [14]. Interestingly, these same cells might play a role in the pathogenesis of granulomatous diseases such as sarcoidosis.”

“The occurrence of granulomatous disease after SARS-CoV-2 infection raises questions, as many actors in the pathogenesis of both diseases seem to be linked”

“Altogether, these case reports suggest that SARS-CoV-2 might trigger granulomatous manifestations via the renin-angiotensin system and innate immune response. Targeting of the renin-angiotensin system or MAIT cells (eg with inhibitory MR1 ligands) could be interesting in both COVID19 and sarcoidosis.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8056977/

AGROBACTERIUM - MORGELLONS DISEASE

“Abstract

Background Morgellons disease is characterized by dysesthesias and dermatologic lesions that range from minor to disfiguring (Savely VR, Leitao MM, Stricker RB. Am J Clin Dermatol 2006;7:1-5). The disease has been reported primarily in Florida, Texas, and California. Although an infectious etiology of Morgellons disease has been postulated, treatment of the disease remains problematic, with many patients having inadequate responses to antimicrobial therapy. Skin biopsies of Morgellons patients reveal nonspecific pathology or an inflammatory process with no observable pathogens, often with fibrous material projecting from inflamed epidermal tissue. Morgellons skin fibers appear to contain cellulose. This observation indicates possible involvement of pathogenic Agrobacterium, which is known to produce cellulose fibers at infection sites within host tissues.

Methods Skin biopsy samples from two Morgellons patients were subjected to high-stringency PCR testing for genes encoded by the Agrobacterium chromosome. Screening of the same samples for Agrobacterium virulence (vir) genes and T-DNA sequences in the patient's genome was also performed.

Results PCR screening indicated that the presence of Agrobacterium genes derived from both the chromosome and the Ti plasmid, including the T-DNA, in tissues from both Morgellons patients.

Conclusions Our preliminary results indicate that Agrobacterium may be involved in the etiology and/or progression of Morgellons disease. If these results are confirmed, it would be the first example of a plant-infecting bacterium playing a role in human disease. Further testing is ongoing to validate this observation and to determine whether Agrobacterium not only resides in the infected areas but also transforms them genetically."
https://jim.bmj.com/content/55/1/S123.4
https://www.globalresearch.ca/agrobacterium-morgellons-disease-a-gm-connection/9891

CDC - COVID-19 AND FUNGAL INFECTIONS
COVID-19-associated fungal infections can lead to severe illness and death.1, 3, 4, 7, 8, 28, 29, 30 Symptoms of certain fungal diseases can be similar to those of COVID-19, including fever, cough, and shortness of breath.1, 31 Some patients can have COVID-19 and a fungal infection at the same time. Laboratory testing is necessary to determine if a person has a fungal infection, COVID-19, or both.

COVID-19 likely increases the risk for fungal infections because of its effect on the immune system and because treatments for COVID-19 (like steroids and other drugs) can weaken the body's defenses against fungi.32 The most commonly reported fungal infections in patients with COVID-19 include aspergillosis, invasive candidiasis, and mucormycosis (sometimes called by the misnomer "black fungusexternal icon."1–6 Fungal infections resistant to antifungal treatment have also been described in patients with severe COVID-19.19, 20

Awareness of the possibility of fungal co-infection with COVID-19 is essential to reduce delays in diagnosis and treatment in order to help prevent severe illness and death from these infections.

COVID-19-associated pulmonary aspergillosis
Scientists are still learning about aspergillosis (infections caused by the fungus Aspergillus) in people with severe COVID-19. In the past, scientists thought aspergillosis occurred almost entirely in people with severely weakened immune systems. However, aspergillosis has been increasingly reported in patients without weakened immune systems but who have severe respiratory infections caused by viruses, including influenza. Several recent reports describe COVID-19-associated pulmonary aspergillosis (CAPA).1, 3, 6, 9,10-14, 33

Available information indicates that CAPA:

Usually occurs in patients with severe COVID-19 (e.g., patients on ventilators in ICUs)1 ,6, 11-14
Can be difficult to diagnose because patients often have non-specific symptoms and testing typically requires a specimen from deep in the lungs11, 14
Can cause severe illness and death8 ,9, 11-14
Clinicians should consider the possibility of aspergillosis in patients with severe COVID-19 who have worsening respiratory function or sepsis, even if they do not have classical risk factors for

aspergillosis.16 Testing for CAPA usually involves obtaining specimens from patients' lower respiratory tract, which are tested for Aspergillus galactomannan antigen and fungal culture. The treatment of CAPA includes antifungals like voriconazole, posaconazole, and isavuconazole. Therapeutic drug monitoring should be considered when using these antifungals in CAPA treatment.34, 35

COVID-19-associated mucormycosis

Often called by the misnomer "black fungusexternal icon," COVID-19-associated mucormycosis is a major public health problem in India.30, 36 COVID-19-associated mucormycosis cases have also been seen outside of India, including in the United States, although much less commonly. Uncontrolled diabetes and overuse of steroids for COVID-19 treatment are important risk factors.28, 29, 37

Biomarkers for diagnosing invasive aspergillosis, such as beta-d-glucan and galactomannan, are typically negative in patients with mucormycosis. The treatment for mucormycosis frequently involves aggressive surgical intervention and treatment with antifungals, including amphotericin B, posaconazole, or isavuconazole. Voriconazole is not recommended for treating mucormycosis.27 Providers should consider therapeutic drug monitoring during COVID-19-associated mucormycosis treatment.34, 35

The risk of COVID-19-associated mucormycosis may be decreased by encouraging vaccination against COVID-19, prescribing steroids for COVID-19 treatment based on guidelinesexternal icon, and controlling the blood sugar of patients with diabetes who have COVID-19.28, 29 Early diagnosis and treatment are key to improving outcomes for patients with COVID-19-associated mucormycosis. Clinicians should consider the possibility of mucormycosis in patients with COVID-19 even when patients lack classic risk factors for this disease.

Increased spread of Candida auris during COVID-19 pandemic

Candida auris (C. auris) is an emerging fungus that can cause outbreaks of severe infections in healthcare facilities. In the United States, it has most commonly spread in long-term care facilities caring for people with severe medical conditions. However, since the start of the COVID-19 pandemic, outbreaks of C. auris have been reported in COVID-19 units of acute care hospitals.38 These outbreaks may be related to changes in routine infection control practices during the COVID-19 pandemic, including limited availability of gloves and gowns, reuse or extended use of these items, and changes in cleaning and disinfection practices. Screening for C. auris colonization, an important part of containment efforts, has been more limited as healthcare facilities and health departments have been responding to COVID-19.

Invasive candidiasis in patients with COVID-19

Patients hospitalized for COVID-19 are at risk for healthcare-associated infections (HAIs), including candidemia, or bloodstream infections caused by Candida.7, 17–19 Patients with COVID-19 who developed candidemia were less likely to have certain underlying conditions and procedures commonly associated with candidemia and more likely to have acute risk factors linked to COVID-19 care, including medicines that suppress the immune system.

Fungal pneumonias can resemble COVID-19
Other fungal diseases, such as Valley fever (coccidioidomycosis), histoplasmosis, and blastomycosis, can cause fever, cough, and shortness of breath, similar to COVID-19 and bacterial pneumonias.21 These fungi live in soil. People become infected by breathing in fungi present in the air. Clinicians should consider fungal pneumonias as a possible cause of respiratory illness, particularly if COVID-19 testing is negative. It is important to note that these fungal diseases can occur at the same time as COVID-19.22, 23."
https://www.cdc.gov/fungal/covid-fungal.htm

POST COVID MUCORMYCOSIS
"We are learning more about the new and long-term manifestations of the Covid-19 infection. Its association with invasive mucormycosis sinusitis is dangerous and must be given serious consideration. Uncontrolled diabetes and over-zealous use of steroids are two of the main factors aggravating the illness, and both of these must be properly checked. If infected, early surgical intervention and intravenous anti-fungal treatment should be sought for management, as a good prognosis and less fulminant disease course can be achieved in cases of post-coronavirus mucormycosis."
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8060545/

PFIZER - MUCORMYCOSIS
"Fungi, especially the spores of aspergillosis, can be found everywhere in the environment: it can be found in soil, decomposing plant matter, plants, air, food, and water. According to Aram, aspergillosis (which is found in household dust, building materials—in addition to soil, plants, food, and water) is approximately10 times more prevalent than the mucor fungi associated with mucormycosis (which are found in the environment as well—such as in soil and decaying organic material.) "We live with them every day, and as immune-competent people, we usually do not have a problem with that," he says.

These spores can enter the body in several ways: by inhaling them, swallowing them in food or medicines, or by spores entering wounds and contaminating them. Inhalation is the most common way of coming into contact with these fungi that cause systemic infection.

Healthy people can usually clear these spores from the body. It becomes a problem when either our immune systems are weakened, or there is damage to the natural human defenses in tissues or the lungs—for instance, with a COVID-19 infection—which can cause an infection to spread."

"Due to the spread of the Delta variant, countries could potentially see an increase in fungal infections—not only in India but worldwide. It is important for health care providers to have greater awareness and to be prepared, especially for high-risk patients. Quicker diagnoses, better treatment methods, and more research are needed to control these fungal infections."
https://www.pfizer.com/news/articles/the_truth_about_covid_19_and_black_fungus

ECOLOGICAL SOCIETY OF AMERICA - GENETICALLY ENGINEERED ORGANISMS
“The Ecological Society of America has evaluated the ecological effects of current and potential uses of field-released genetically engineered organisms (GEOs), as described in this Position Paper. Some GEOs could play a positive role in sustainable agriculture, forestry, aquaculture, bioremediation, and environmental management, both in developed and developing countries. However, deliberate or inadvertent releases of GEOs into the environment could have negative ecological effects under certain circumstances.

Possible risks of GEOs could include: (1) creating new or more vigorous pests and pathogens; (2) exacerbating the effects of existing pests through hybridization with related transgenic organisms; (3) harm to nontarget species, such as soil organisms, non-pest insects, birds, and other animals; (4) disruption of biotic communities, including agroecosystems; and (5) irreparable loss or changes in species diversity or genetic diversity within species. Many potential applications of genetic engineering extend beyond traditional breeding, encompassing viruses, bacteria, algae, fungi, grasses, trees, insects, fish, and shellfish. GEOs that present novel traits will need special scrutiny with regard to their environmental effects.

The Ecological Society of America supports the following recommendations. (1) GEOs should be designed to reduce environmental risks. (2) More extensive studies of the environmental benefits and risks associated with GEOs are needed. (3) These effects should be evaluated relative to appropriate baseline scenarios. (4) Environmental release of GEOs should be prevented if scientific knowledge about possible risks is clearly inadequate. (5) In some cases, post-release monitoring will be needed to identify, manage, and mitigate environmental risks. (6) Science-based regulation should subject all transgenic organisms to a similar risk assessment framework and should incorporate a cautious approach, recognizing that many environmental effects are GEO- and site-specific. (7) Ecologists, agricultural scientists, molecular biologists, and others need broader training and wider collaboration to address these recommendations.

In summary, GEOs should be evaluated and used within the context of a scientifically based regulatory policy that encourages innovation without compromising sound environmental management. The Ecological Society of America is committed to providing scientific expertise for evaluating and predicting the ecological effects of field-released transgenic organisms.”
https://esajournals.onlinelibrary.wiley.com/doi/10.1890/04-0539

WORLD HEALTH ORGANIZATION - PRIORITIZING A RESPONSE TO INVASIVE FUNGUS
“Despite the growing concern, fungal infections receive very little attention and resources, leading to a paucity of quality data on fungal disease distribution and antifungal resistance patterns. Consequently, it is impossible to estimate their exact burden.

In 2017, WHO developed its first bacterial priority pathogens list (WHO BPPL) in the context of increasing antibacterial resistance to help galvanize global action, including the research and development (R&D) of new treatments. Inspired by the BPPL, WHO has now developed the first fungal priority pathogens list (WHO FPPL). The WHO FPPL is the first global effort to systematically prioritize fungal pathogens, considering their unmet R&D needs and perceived

public health importance. The WHO FPPL aims to focus and drive further research and policy interventions to strengthen the global response to fungal infections and antifungal resistance.

The development of the list followed a multicriteria decision analysis (MCDA) approach. The prioritization process focused on fungal pathogens that can cause invasive acute and subacute systemic fungal infections for which drug resistance or other treatment and management challenges exist. The pathogens included were ranked, then categorized into three priority groups (critical, high, and medium). The critical group includes Cryptococcus neoformans, Candida auris, Aspergillus fumigatus and Candida albicans. The high group includes Nakaseomyces glabrata (Candida glabrata), Histoplasma spp., eumycetoma causative agents, Mucorales, Fusarium spp., Candida tropicalis and Candida parapsilosis.

Finally, pathogens in the medium group are Scedosporium spp., Lomentospora prolificans, Coccidioides spp., Pichia kudriavzeveii (Candida krusei), Cryptococcus gattii, Talaromyces marneffei, Pneumocystis jirovecii and Paracoccidioides spp.

This document proposes actions and strategies for policymakers, public health professionals and other stakeholders, targeted at improving the overall response to these priority fungal pathogens, including preventing the development of antifungal drug resistance. Three primary areas for action are proposed, focusing on: (1) strengthening laboratory capacity and surveillance; (2) sustainable investments in research, development, and innovation; and (3) public health interventions.

Countries are encouraged to improve their mycology diagnostic capacity to manage fungal infections and to perform surveillance. In most contexts, this might require a stepwise approach. There is a need for sustainable investments in research, development, and innovation. More investments are needed in basic mycology research, R&D of antifungal medicines and diagnostics. Innovative approaches are needed to optimize and standardize the use of current diagnostic modalities globally. In addition, public health interventions are needed to highlight the importance of fungal infections, including through incorporating fungal diseases and priority pathogens in medical (clinical) and public health training programmes and curricula at all levels of training. Similarly, collaboration across sectors is required to address the impact of antifungal use on resistance across the One Health spectrum.

Finally, regional variations and national contexts need to be taken into consideration while implementing the WHO FPPL to inform priority actions.
https://www.who.int/publications/i/item/9789240060241

POTENTIAL TREATMENTS? (AMONG OTHERS)
FARNESOL
“In enzymology, a farnesol dehydrogenase (EC 1.1.1.216) is an enzyme that catalyzes the chemical reaction

2-trans,6-trans-farnesol + NADP+

⇌\rightleftharpoons 2-trans,6-trans-farnesal + NADPH + H+
Thus, the two substrates of this enzyme are 2-trans,6-trans-farnesol and NADP+, whereas its 3 products are 2-trans,6-trans-farnesal, NADPH, and H+.

This enzyme belongs to the family of oxidoreductases, specifically those acting on the CH-OH group of donor with NAD+ or NADP+ as acceptor. The systematic name of this enzyme class is 2-trans,6-trans-farnesol:NADP+ 1-oxidoreductase. Other names in common use include NADP+-farnesol dehydrogenase, and farnesol (nicotinamide adenine dinucleotide phosphate) dehydrogenase."
https://en.wikipedia.org/wiki/Farnesol_dehydrogenase

GANS PLASMA
"The First One Cup One Life was released through the first emergency relief in China and works on the white tissues of the lungs and brain.

The Second Cup of Life was released for the new mutation of the Corona Virus and works on the red tissues of the stomach and down the body.

The application of both Cups and the Plasma Water of each, are used in combination.

Please read carefully through both documents and apply like described."
https://en.kfwiki.org/wiki/One_Cup_One_Life_-_Production_and_Application_-_Prevention_and_Reversal_of_the_Corona_Virus

GMO SPIN DOCTORS ARE USING CORONAVIRUS VACCINES TO PROMOTE GM CROPS
"With over 2 million dead, and countries as developed as the UK and the USA failing miserably to contain the virus, it's understandable that many see vaccines as a silver bullet that can save the world from the illness and death, never mind the social isolation and economic collapse, that the current pandemic is leaving in its wake. It's perhaps equally unsurprising that hard pressed promoters of GM crops and animals are seeing this as an ideal marketing opportunity.

Charles hates GM. Will he spurn this vaccine? ran a headline in the Sunday Times to an article that declared, "Pfizer shows us genetic modification could protect humanity from Covid-19." Its author, Dominic Lawson, lambasts the heir to the UK throne for his well known opposition to GM crops, and claims that it is politics, rather than science, that can "obstruct or even deny society the full benefits of scientific breakthroughs. This is true of genetic modification more widely."

Lawson's thesis is somewhat undermined by his record as a rightwing idealogue who has long argued against the scientific consensus on climate change. There's also the little matter of the Pfizer vaccine being chemically synthesized rather than genetically engineered. In other words, contrary to Lawson's claim, the Pfizer vaccine is not in any sense "GM".

But Lawson is far from the only GM spin doctor trying to use vaccines for COVID-19 as a validation of GM crops and animals. Lawson's sometime ally Mark Lynas is at it too, albeit with a

tad more accuracy as regards the Pfizer vaccine, using his perennial gimmick of smearing all GM crop critics as anti-science.

Also at it is Bill Horan, a former board member of the National Corn Growers Association and an advocate for genetically engineering pharmaceuticals into corn (what could possibly go wrong?). “The science of GM technology may save my life. That’s because I’m about to get my COVID-19 vaccine,” Horan breathlessly tells us. Yet in the United States, where Horan farms, only two vaccines are currently authorized: Pfizer’s and Moderna’s. Like Pfizer's, Moderna’s vaccine is chemically synthesized and not genetically engineered, i.e. whichever vaccine Horan gets, it will not be GM.* But that doesn’t stop him using his upcoming appointment as the springboard for an extravagantly inaccurate article about the many wonders of GM crops.

And then there’s former vice president of the National Farmers Union (NFU) and founder of the European Biotech Forum, Paul Temple, who writes: “New genetic technology has been welcomed, with the incredible speed of vaccine development. The crisis of COVID-19 would be worse than it already is if we had not had this technology adopted and accepted in its use. The same technologies that have produced amazing genetic advances in agriculture, are now supplying us with the vaccine that will allow us to manage COVID-19 on a global basis.”

Everything about this is cockeyed. Temple implies that these vaccines were developed using technologies first developed for crops and that are now being applied for medical use. This is a joke. Only some of the vaccines (most obviously, the AstraZeneca one and the Russian vaccine) have been developed using any form of genetic engineering. And vaccine developers have not adopted “agbiotech” to develop their products but have simply used pre-existing medical technologies. Genetic technologies upon which some of the COVID-19 vaccines are based began to be developed in the late 1980s and have always been on a path that is completely independent of GM crops. In fact, if anything, advances in molecular genetics and genetic technologies for medical research and clinical use have been exploited by GM crop developers and not the other way round.

Just as importantly, medical uses of GM technologies are completely different from their uses in agriculture. They are partly governed by different rules and the culture of medical research is highly safety conscious. Medicines are strictly regulated for safety and must go through lengthy safety and efficacy tests before they are allowed to be used on people, and they are also monitored post-release. Even with these safeguards in place, there are often side-effects and we know that things can still go wrong – but at least there is a system in place to try to ensure safety.

And crucially, medicines are used on people for very specific conditions and only with their informed consent, so that people can weigh the benefits against any risks. In contrast, GM crops and foods are subjected to minimal safety checks and the UK government is even trying to remove these.

What is more, the UK government is trying to remove informed consent regarding planting GM gene-edited seeds and eating GM gene-edited foods, in that these products will probably not be labeled if they are removed from regulation. It's also worth noting, by the way, that none of the vaccines the GM promoters are jumping up and down about involve gene editing, which is the focus of the UK government's current obsession with deregulation.

And gene-edited crops and foods could turn out to contain new toxins or allergens. So safety checks are a vital protection for health, as well as the environment. Just as GM medicines are regulated, so GM crops and foods should be regulated too before being released into our fields and onto our plates.

If Paul Temple is trying to make us believe that GM crops have "produced amazing genetic advances in agriculture", this is far from obvious. Detailed comparisons of yields and pesticide use between the United States, where GM crops have been widely adopted, and Europe, where they haven't, show Europe has done as well or better on both scores without them.

And there is certainly no sign that gene editing is about to change that picture. There is not one gene-edited crop that improves performance. And the first commercialized gene-edited crop, Cibus's SU Canola, is gene edited to survive being sprayed with herbicide, which is the most common type of old-style GM crop too. So in spite of the hype about "amazing genetic advances", there is precious little evidence to support it.

Finally, we shouldn't forget that there is a massive difference between tackling a pandemic where, despite all its wide-ranging global consequences, the target is a single virus, and the breadth and complexity involved in delivering sustainable agriculture around the world, where the cult of the quick fix has been shown time and again to be a dangerous delusion that distracts major resources and attention away from more viable long-term solutions.

* The operative word here in "genetically modified organism" is "organism". The Pfizer vaccine mRNA material is chemically synthesized and is not an organism. Thus the vaccine is not a GMO."
https://www.gmwatch.org/en/106-news/latest-news/19682-gm-spin-doctors-are-using-coronavirus-vaccines-to-promote-gm-crops

PROCESSED, ORGANIC AND BIOENGINEERED OR GENETICALLY MODIFIED FOODS
Processed Foods
The US Department of Agriculture (USDA) defines a processed food as any raw agricultural commodity that been subject to washing, cleaning, milling, cutting, chopping, heating, pasteurizing, blanching, cooking, canning, freezing, drying, dehydrating, mixing, packaging, or other procedures that alter the food from its natural state.

Based on this definition, virtually all food is processed to some degree. Some modern food processing, however, strips nutrients from foods. For example, milling removes bran and germ,

and thus fiber, iron, and many B vitamins from grains. Processing also often adds additives such as preservatives (eg, benzoates, sorbates, nitrites, sulfites, and citric acid); artificial colors, flavors, and sweeteners; stabilizers; emulsifiers; and synthetic vitamins and minerals and other additives including salt, monosodium glutamate (MSG), sugar, fats, and refined oils. Some food additives can adversely affect children in particular.

Ultra-processed foods (eg, sweets, salty snacks, sugar-sweetened beverages, ready-to-eat meals, and fast food) are increasingly common and make up nearly half of the food supply in many countries. They are made from inexpensive ingredients (including unhealthful fats, refined grains and starches, and added sugar and salt) that are often combined with food additives (including artificial colors, flavors, and preservatives) to make them inexpensive and exceptionally tasty and to prolong shelf life. Most contain little to no whole foods. These foods promote overeating and weight gain and supply a relative dearth of valuable nutrients, increasing risks of insulin resistance and possibly other disorders (eg, coronary artery disease, depression, irritable bowel syndrome, cancer, and even early death).

Organic Foods
To be labeled USDA-certified organic, organic foods must be grown and processed according to federal guidelines that address many factors, including soil quality, animal-raising practices, pest and weed control, and the use of additives. For example, for meat to be labeled organic, the animals must be raised in conditions that accommodate their natural behaviors (such as the ability to graze in a pasture), must be fed 100% organic feed and forage, and must not be given antibiotics or hormones. To be labeled with the USDA organic seal, a product must contain 95% organic ingredients.

Although the certainty and extent of health benefits attributed to foods being organic remain unknown, the absence of antibiotics helps prevent antibiotic resistance. Synthetic pesticides may also increase risks of autism, attention-deficit/hyperactivity disorder (ADHD) and impaired cognitive skills in children. One strategy to help contain the increased costs of organic foods is to consider the Environmental Working Group's (EWG) annual lists of pesticide levels that list the dirty dozen (produce that is contaminated with more pesticides than other crops) and the clean fifteen (produce that has the lowest amounts of pesticide residues)."
https://www.merckmanuals.com/home/disorders-of-nutrition/overview-of-nutrition/processed-foods,-organic-foods,-and-bioengineered-or-genetically-modified-foods

BIOENGINEERED OR GENETICALLY MODIFIED FOODS = MERCK
"Bioengineered or genetically modified foods are foods containing genetically modified organisms (GMOs).

According to the World Health Organization (WHO), bioengineered or genetically modified foods contain DNA that has been modified through laboratory techniques and that cannot be created through conventional breeding or found in nature. Genetically modified foods have existed in the US food supply since the early 1990s, and their safety in humans and animals is overseen by

the U.S. Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), and the USDA.

Beginning in January 2022, foods require labeling that indicates whether they are a bioengineered food. These foods are often common ingredients in other foods and may be difficult to identify.

Although consumption of bioengineered foods poses no risk to human health, food safety advocacy groups have raised concerns such as development of allergies (if the transferred DNA was taken from an allergenic food) and antibiotic resistance resulting from the consumption of herbicide-resistant crops that could theoretically transfer modified antibiotic-resistant genes to the human digestive tract. The WHO has stated that risk of such antibiotic resistance is very small, but not insignificant."
https://www.merckmanuals.com/en-ca/home/disorders-of-nutrition/overview-of-nutrition/processed-foods,-organic-foods,-and-bioengineered-or-genetically-modified-foods

ANTI-GMO MOVEMENT DOUBTS COVID VACCINES (UNSUPPORTED DEROGATORY STATEMENTS)

"While most of the world celebrated the announcement of Pfizer's COVID-19 vaccine, not all were pleased. The movement against genetically modified crops fumed because the vaccine was developed using genetic modification technology.

The long-awaited coronavirus vaccines developed by Pfizer and Moderna both use messenger RNA, a form of genetic material, to create a decoy protein that the immune system attacks, creating antibodies that can fend off future SARs-COV-2 infections. Both vaccines have been found to be highly effective and they have moved onto their final rounds of authorization in the United States. The Pfizer vaccine is already being implemented in the United Kingdom.

This is fantastic news, unless you're a member of the anti-science, anti-GMO movement.

Supporters of the anti-GMO (genetically modified organism) movement oppose the use of genetic modification in any form. While the conversation around GMOs is typically centered around the use of modified foods, the use of mRNA in the vaccines has anti-GMO believers back on their soapboxes.

A recent survey conducted by the Boston Globe revealed that 29 percent of respondents did not plan on taking the vaccine immediately. Among those who vowed not to take the vaccine were anti-GMO advocates.

"Not an anti-vaxxer, concerned that this new type of shot has been rushed and we still don't know the long-term effects on humans using a new mRNA shot. If it was a traditional shot and not mRNA or DNA I would take it. Also, mRNA has 'proprietary' elements in the shot that I will not accept into my body, no GMO (genetically modified organisms) for myself and kids. I do not eat GMO food either," said a Boston man named Dave.

In a similar story, Agartha Franklin, a reader of the New Hampshire-based Conway Daily Sun, submitted a letter explaining that she too would not take the vaccine because it was developed using gene-editing technology.

“Never. No way. No how. Keep your warp speed GMO never before used vaccine with untold long-term side effects and nowhere-near-enough science behind it to suggest the efficacy. Two hundred people is not a sample size large enough to be statistically relevant. I cannot believe all the people willing and ready and wanting to take this vaccine,” Franklin said.

In other words, the anti-GMO movement will refuse to take the vaccine because they don’t like the idea of genetic modification, even if scientists around the globe have confirmed the safety of the vaccine. This is the same song-and-dance the anti-GMO movement has done when it comes to consuming modified foods that have been proven safe for decades.

Experts have already warned that anti-GMO sentiments could cause global famine. Now, the anti-GMO movement threatens to prolong the pandemic–and risk the personal safety of its believers–because of the distrust of science it creates.”
https://accountablescience.com/anti-gmo-movement-doubts-covid-19-vaccines/

COVID-19 VACCINES HAVE WEAKENED THE ANTI-GMO MOVEMENT (PRO GMO)
“William Reville
Tue Jun 22 2021 - 01:00

Environmental groups opposed to genetically modified organisms (GMOs) have been very influential for a considerable time and capable of raising large public protests. But the anti-GMO movement is now in decline as the EU and various influential environmental organizations begin to cautiously welcome selected genetically engineered organisms.

The final nail in the anti-GMO coffin is likely to be the spectacular success of the genetic technology that has just developed several highly effective vaccines against Covid-19 within the miraculously short time frame of one year.

On January 10th, 2020, Chinese scientists published the genome of a new disease-causing coronavirus Sars-CoV-2, similar to the virus that caused severe acute respiratory syndrome (Sars) in 2003.

Total doses distributed to Ireland	Total doses administered in Ireland
9,452,860	7,856,558

But there were also striking differences and therefore nobody was immune. Developing vaccines against the rapidly spreading Sars-CoV-2 was the only hope of averting a deadly assault on public health but the problem was that it takes six to seven years on average to

develop a new vaccine using traditional methods based on a weakened or killed Sars-CoV-2 virus.

This is where the smart new genetic techniques came to the rescue, aided by unprecedented international scientific collaboration, bottomless financial resources and an army of volunteers willing to participate in trials. By April 2020, 80 institutes and pharmaceutical companies were developing vaccines across 19 countries, mostly using gene-based methods. It was predicted that commercial vaccines would be available by early 2021. On January 4th, 2021 the UK started public inoculations with the Oxford AstraZeneca vaccine.

Several highly effective vaccines, including Pfizer-BioNTech, Moderna, AstraZeneca, Johnson & Johnson (Janssen) and Sputnik V are now available, each having progressed through all the correct phases of vaccine development within one year. The biggest vaccination campaign in history is now under way – more than 1.94 billion doses have been administered across 176 countries, vaccinating 12.7 per cent of world population as of early June.

Genetic technology powered development of Covid-19 vaccines. The Pfizer and Moderna vaccines are messenger RNA (mRNA) vaccines, based on RNA molecules carrying genetic information for the synthesis of the "spike protein" of the Sars-CoV-2 virus that enables this virus to enter cells.

When the mRNA, enclosed in an artificial membrane, is injected into your arm the mRNA prompts cells near the injection site to make the spike protein. This trains your immune system to make antibodies and T-cells that will inactivate the Sars-CoV-2 virus if it infects you later.

The AstraZeneca, Johnson and Johnson and Sputnik V vaccines are fully “genetically engineered”.

They use a “viral vector”, an adenovirus – a type of virus that causes the common cold – to carry the vaccine into your cells. The adenovirus genome is stripped of any genes that might harm you and the Sars-CoV-2 spike protein genetic sequence is then spliced into the adenovirus genome.

This genetically doctored adenovirus carries the information for making the Sars-CoV-2 spike protein into your cells, training your immune system as already described for the mRNA vaccines.

For many years past the European Union set its face against genetically engineered organisms but this anti-GMO stance weakened recently mainly because biotechnology techniques can help the EU to meet environmental sustainability goals. And when the Sars-CoV-2 virus appeared on-stage the EU suspended some of its biotechnology regulations to fast-track development of Covid-19 vaccines.

Environmental effects

Two powerful US environmental organizations, the Sierra Club and the Union of Concerned Scientists (UCS), recently cautiously welcomed certain genetically engineered plants. American chestnut trees have been almost eradicated by a deadly fungus infection and the Sierra Club has endorsed release of a genetically engineered chestnut tree “Darling 58” that resists the fungus infection.

The UCS has grown increasingly concerned about the environmental effects of animal agriculture. It is impressed with the potential of plant-based “meats” to reduce these impacts and recently changed its stance against the plant-based “Impossible Burger” whose key ingredient is made with the help of genetic engineering.

GMOs have a great safety record. Scientists who genetically enhance animal and plant organisms work extremely cautiously, knowing well that releasing even one genetically engineered organism that caused environmental harm would be disastrous to their whole project.

The anti-GMO lobby acts mainly out of ideological convictions, mistrusts science and exaggerates perceived “dangers”. But it now looks like their reign is almost over. Cautious general acceptance of GMOs will follow. Genetic modification has much to offer as everyone who offers their arm to the vaccination needle can confirm.

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https://www.irishtimes.com/news/science/covid-19-vaccines-have-weakened-the-anti-gmo-movement-1.4594120

The immune system is broken down over time due to several factors becoming prime for fungal infection. Subsequent GMO bacteria/fungus injection/ingestion exasperates the infection. Untreated fungal infections are associated with incredibly high rates of morbidity.

SUPPLEMENTARY INFORMATION
https://www.i-sis.org.uk/horizontalGeneTransfer.php
https://www.slideshare.net/IsaacMajiokKok/the-hidden-hazard-of-horizontal-gene-transferpdf
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Review > Curr Opin Pediatr. 2013 Dec;25(6):736-47. doi: 10.1097/MOP.0000000000000031.

Primary immunodeficiencies underlying fungal infections

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Abstract

Purpose of review: We review the primary immunodeficiencies (PIDs) underlying an increasing variety of superficial and invasive fungal infections. We also stress that the occurrence of such fungal infections should lead physicians to search for the corresponding single-gene inborn errors of immunity. Finally, we suggest that other fungal infections may also result from hitherto unknown inborn errors of immunity, at least in some patients with no known risk factors.

Recent findings: An increasing number of PIDs are being shown to underlie fungal infectious diseases in children and young adults. Inborn errors of the phagocyte NADPH oxidase complex (chronic granulomatous disease), severe congenital neutropenia (SCN) and leukocyte adhesion deficiency type I confer a predisposition to invasive aspergillosis and candidiasis. More rarely, inborn errors of interferon-γ immunity underlie endemic mycoses. Inborn errors of interleukin-17 immunity have recently been shown to underlie chronic mucocutaneous candidiasis (CMC), while inborn errors of caspase recruitment domain-containing protein 9 (CARD9) immunity underlie deep dermatophytosis and invasive candidiasis.

Summary: CMC, invasive candidiasis, invasive aspergillosis, deep dermatophytosis, pneumocystosis, and endemic mycoses can all be caused by PIDs. Each type of infection is highly suggestive of a specific type of PID. In the absence of overt risk factors, single-gene inborn errors of immunity should be sought in children and young adults with these and other fungal diseases.

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