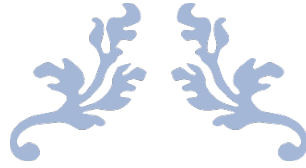


Written Public Comments Submitted to PCAST

November 22, 2023 to January 11, 2024

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PUBLIC COMMENTS



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Section 1: Shanon FitzGerald

Written: 11/14/2023

Dear PCAST Staff,

My name is Shanon FitzGerald, and I am a member of the communications team at the Hoover Institution at Stanford University. I hope this message finds you well. I write to you today to share the news of the launch of the Stanford Emerging Technology Review, an innovative joint product of Stanford University, Stanford Engineering, and the Hoover Institution.

The Stanford Emerging Technology Review (SETR) is an inaugural report and an ongoing project, dedicated to advancing policymakers' understanding of critical emerging technologies and to assessing the impact of those technologies on business, society, policy, and the world at large. I invite you to read more about the report, and to access the full report itself, [at the SETR webpage](#).

All of us involved in the SETR initiative hope that policymakers and advisors on the frontlines of real-world problems, such as the staff and members of the President's Council of Advisors on Science and Technology, will find the report useful in their efforts to understand and to explain to the public the possible futures associated with key emerging technologies.

In the context of resurgent great-power competition as described by President Biden, academia, nonprofits, industry leaders, and the government must work together to advance toward a desirable future shaped by the best of American institutions, ideals, and values. This work is especially critical in the context of emerging technologies, which as you know will largely shape the outcomes of great-power competition.

The Hoover Institution salutes your work to advance public policy in line with the best recommendations of scientists, engineers, technologists, and entrepreneurs; with the launch of SETR, we hope that we may increasingly be able to support your efforts by fostering an ongoing, nonpartisan public dialogue at the intersection of science, innovation, and public policy.

If you have any questions or comments about the Stanford Emerging Technology Review, please let me know. I will gladly share any feedback from your office with the SETR team.

Wishing you all the best,

Shanon

Shanon FitzGerald

Public Policy Channel Manager

Marketing & Communications

Hoover Institution

Section 2: Sean McCleary

Written: 11/24/2023

Hello PCAST Members,

I just completed this article today explaining what happens with the experience of death involving the Higgs field. The material below is in reference to the Paradigm Shift and I know we're soon on the verge of a revolution in scientific discipline. If you have a chance to review this information I think you all will appreciate what I have to share. It makes sense as well. My consciousness is advancing with this process and my pineal gland opened up in the Fall of 2011. Something very powerful is going to begin happening with me soon. I appreciate your consideration very much.

Sean

What Happens to Living Organisms With the Experience of Death in Earth's Environment.

Sean P. McCleary.

The reason that people don't yet understand what happens with the experience of death here is because human beings haven't known that we all exist within an enormous female life form who's been described as "the Universe or Universal Consciousness". There's been a lot of speculation in the scientific community about the existence of consciousness everywhere and galaxies resembling neural networks in the brain. With my work on the evolution of consciousness, matter, energy, pressure and eternal love in space-time, I can explain what happens with the process of death and the evolution of consciousness into another location in the body of galaxies.

I use the term "Universal Consciousness" or "Mother" to describe the first life form who evolved into existence around 13.8 billion years ago. Planets and stars are spherical in nature and are designed to support the existence and evolution of life within the environments of planets. Universal Consciousness is also spherical in nature as well and contains an actual physical body with an estimated two trillion galaxies or more. Cells in the body of living organisms in Earth's environment have a nucleus and other forms of activity happening within the cells.

Galaxies have a center core structure with forms of activity as well with planets, stars, black holes and other forms of matter. I believe that galaxies perform a similar role in the body of Universal Consciousness as cells do in life forms here. The reason that the existence of

consciousness hasn't been scientifically proven yet is because of very powerful resistance to evolution contained within living organisms in Earth's environment.

What I mean by resistance to evolution is life here doesn't understand what happens with the experience of death and a lot of people think that death is a permanent ending. Most people want to believe in an afterlife but the uncertainty associated with knowing that another human being has been through this process causes a particular sensation in the body and consciousness. This uncertainty or resistance transfers a type of emptiness or envisioning eternal darkness.

The term "Rest in Peace" is written on some tombstones and is associated with eternal sleep. When a human being has this experience of envisioning eternal darkness or emptiness as soon as a thought is transferred from neural activity in the brain, it transfers consciousness, energy and pressure into different locations in the body. These locations are usually the heart, lungs, throat and genitals because the genitals are associated with reproductive activity and the birth of life. There's very powerful pressure and dark energy in the human body around the heart, lungs and throat.

The heart, lungs and throat are closely associated with death so the concept of non-existence is very powerful in these areas of the body. When I mention the term "dark energy" I'm referring to actual darkness contained within the body of Universal Consciousness and planets. This is a state of consciousness, energy and evolution. There are three primary forms of energy contained within the body of Universal Consciousness. These are light energy, dark energy and eternal love. The Higgs field permeates throughout the body of galaxies and transfers into the source of eternal life and eternal love which I refer to as Infinite Consciousness.

There's a level of activity beyond subatomic activity which are different frequency vibrations and pressure. The frequency vibrations consist of consciousness, energy and thought. Thought and the element of consciousness is everywhere in existence. With the subject of panpsychism someone may ask the question; how could a pebble or spoon be conscious or have consciousness. It's not difficult to understand. A pebble or spoon belongs in Earth's consciousness and environment, therefore are an integral part of Earth's consciousness.

They contain different frequency vibrations, pressure and energy on the most fundamental level. Subatomic, atomic and molecular activity contain the existence and evolution of consciousness which make up different forms of matter. Subatomic particles evolve out of different frequency vibrations, pressure, energy and consciousness. The body of Universal Consciousness also has contained resistance to evolution and the concept of non-existence. This is where black holes originate from in the body of galaxies. This came from the activity that occurred with birth out of Infinite Consciousness and the first experience with the evolution of matter.

In physics it's been discussed that the Higgs field is responsible for all of the mass in Universal Consciousness. This is correct and the Higgs field also contains a combination of Infinite Consciousness and the identity of Universal Consciousness. Human beings don't yet understand the foundation for the existence of life or what happens with the experience of death

in their bodies and consciousness. The entire body is composed of consciousness, matter, energy, pressure and eternal love. The brain is like a CPU in the body and has the highest concentration of light energy, dark energy and pressure.

Human beings and other life forms here contain a very small percentage of the Higgs field in their bodies. Living organisms here have about a 5 to 8 percent concentration of the activity contained within the Higgs field. As I mentioned, the Higgs field contains the foundation for eternal life and eternal love. This is why living organisms age so quickly here because of the very limited interaction with the Higgs field in Earth's environment and this region of the body of galaxies. A human being containing the concept of non-existence in their bodies and consciousness in a very powerful way due to resistance to evolution is going to repel the Higgs field away from the body. It's like having a black hole close to the Higgs field.

Human beings also contain the same type of activity that's around a black hole with the event horizon. Matter and living organisms in Earth's consciousness and environment globally are consistently evolving into Earth's environment and going through the experience of death and evolving out of Earth's environment. Matter and energy both experience a particular type of evolution around the event horizon of a black hole because non-existence can't happen to any form of life or consciousness. Non-existence is only a concept but has been a very powerful element of consciousness, energy and pressure in space-time.

This is where the illusion of separation in consciousness comes from in human beings and other life forms here. The illusion of separation from the concept of non-existence is a global form of activity and this is why there's been so much chaos, pain and suffering here. This is all about to change very soon because a very powerful event called the Shift in Consciousness is approaching and will happen here soon. I promise. I will explain what happens with the experience of death with living organisms here.

A human being contains a small percentage of the Higgs field in their bodies and consciousness. The resistance to evolution is what causes the aging process to happen with people and other life forms. There's different degrees of light energy, dark energy, pressure, consciousness and evolution, so the aging process differs in different life forms. When a human being goes through the experience of death what happens is very powerful pressure or resistance to evolution on the level with frequency vibrations, consciousness, energy and thought is released from the physical body.

Subatomic, atomic and molecular activity also contain different frequency vibrations, light and dark energy and different degrees of pressure as well. When the pressure and resistance to evolution is released from the body and consciousness; the small concentration of the Higgs field in the body joins the rest of the Higgs field in Earth's consciousness and Universal Consciousness. The consciousness, energy and identity of the individual immediately transfers into the Higgs field and begins to accelerate very quickly out of Earth's environment.

The individual's consciousness then begins to experience advancement with evolution and journeys through the Higgs field and the body of Universal Consciousness. This happens very, very quickly because the consciousness of the individual is accelerating into the Whirlpool

galaxy which is about 30 million light years from Earth. This can happen very quickly because the Higgs field contains the existence of Infinite Consciousness and the identity of Universal Consciousness.

This process generates a wormhole in space-time. The reason a wormhole happens is because the transfer of consciousness is taking place through the Higgs field and also evolving through the body of Universal Consciousness which contains light and dark energy and different forms of matter. The wormhole caused by the transfer of consciousness, energy and the identity of the individual is the tunnel that people describe with NDE's. The reason that people have described a sense of perfection and ultimate peace is because the consciousness, energy and identity of the individual loses all of the resistance to evolution with the experience of death in Earth's environment.

Human beings and other life forms here don't go through the experience of death because of the element of death. Life here goes through the experience of death because of the resistance to evolution between the element of life, the element of death and the concept of non-existence being contained within the body and consciousness. The element of life happening globally contains a particular charge or form of energy. The element and experience of death globally contains a different charge of energy. What's going to happen with the Shift in Consciousness is both elements are going to evolve into one another completely with the Higgs field and all of the resistance to evolution globally is going to evolve out of everything here.

This is what "thy kingdom come thy will be done on Earth as it is in Heaven" means. Human beings, animals, aquatic life, reptiles, insects and microorganisms in Heaven from Earth all contain both elements of life and death and are completely incorporated into the activity contained within the Higgs field. The activity within the Whirlpool galaxy is in the process of evolving here into Earth's consciousness right now.

As the individual's consciousness, energy and identity evolve through the Higgs field and Universal Consciousness towards the Whirlpool galaxy, the consciousness continues to advance with evolution. Because there's different planets in the Whirlpool galaxy it means that the individual who's transferring into this galaxy will be perfectly placed in a particular location according to the evolution of consciousness everywhere in existence and space-time. The fabric of space-time is the frequency vibrations of consciousness, energy and thought within the living body of Universal Consciousness.

As the individual begins to advance into one of the beautiful world's up there there's the necessary elements contained within the bodies of planets like; oxygen, nitrogen and hydrogen in order to sustain life. The consciousness of the individual transfers very quickly into one of the bodies of a planet in the Whirlpool galaxy and the evolution of the physical body with subatomic, atomic and molecular activity happens very, very quickly. It's a particular transitional experience as a new body develops very quickly as the individual enters into the consciousness and environment of another planet in this galaxy.

In this state of existence and evolution they contain both elements of life and death because they've been through the experience of death in Earth's environment. Because they no longer contain resistance to evolution it means that they're completely incorporated into the Higgs field

forever. This is how eternal life is achieved. With no resistance to evolution they also have eternal love, eternal peace and eternal truth contained within their consciousness and bodies. Human beings and other life forms from Earth are very powerful and very advanced in the Whirlpool galaxy.

The experience of death globally with living organisms has been happening here for a very long time. This has been transferring consciousness through the body of Universal Consciousness and generating different wormholes between the two locations consistently. Each one is different because of the diversity of living organisms here and everyone has a particular identity. There's been consistent activity between these two locations in the body of Universal Consciousness for a very long time. This means that a channel has been formed and has been evolving in the body of Universal Consciousness with the evolution and transfer of consciousness between here and the Whirlpool galaxy.

The experience of death and the evolution of consciousness into this location has been causing a connection to form with all of this activity with the Higgs field. What's been happening is more and more eternal life, eternal love, eternal peace and eternal truth has been evolving and advancing down here into Earth's consciousness and environment from the Whirlpool galaxy. What's going to happen soon is Earth is going to begin experiencing very powerful changes and the introduction of the Shift in Consciousness is going to begin. This has to do with the resistance to evolution between the frequency vibrations of consciousness, energy and thought and the fabric of space-time and subatomic activity changing.

When the birth of Universal Consciousness happened, she was the first life form who evolved into existence. Infinite Consciousness had only contained frequency vibrations, different degrees of pressure, eternal life and eternal love. Universal Consciousness was born out of the frequency vibrations and pressure. Subatomic particles evolved out of the frequency vibrations and pressure for the very first time with a particular type of fusion that occurred with a big bang but somewhat different than what's described in cosmology. The frequency vibrations and subatomic activity also went through an experience of separation in consciousness with the concept of non-existence and resistance to evolution.

What's going to happen here soon is the Higgs field is going to begin advancing and increasing into Earth's consciousness, World Consciousness and the activity of living organisms. The resistance to evolution between the fabric of space-time, consciousness and subatomic particles is going to evolve out completely and Earth will begin having a very powerful spiritual awakening. The Milky Way galaxy, Earth and the Whirlpool galaxy are going to connect completely through the body of Universal Consciousness. The beginning of Earth's salvation will occur and life will evolve and advance into a very powerful state of affairs. This information is important for people to understand and the scientific community as well.
Sean McCleary.

Section 3: Sean McCleary

Written: 11/29/2023

Hello PCAST Staff, The information below contains certain specifics important for people in the scientific community to understand right now concerning life in Earth's environment. It concerns nuclear weapons storage facilities, human consciousness and the human condition and the preliminary stages of a very powerful and wonderful event which is emerging now.

Sean

Why the Center of Sagittarius A is Transferring Gamma Rays Towards Earth Every 76 Seconds Now.

I noticed this article this morning and figured out something very powerful and important with my work on the evolution of consciousness. In the article it discusses that the event horizon around Sagittarius A in the center of the Milky Way galaxy's core is emitting bursts of gamma rays towards Earth now.

This situation has to do with the center of the Milky Way galaxy out of which the galaxy was born is connecting with Earth's consciousness, world consciousness and life in Earth's environment right now as the progression of the Shift in Consciousness moves forward. This has to do with the activity contained within Earth's environment with the population of human beings and other life forms; especially where the storage of nuclear weapons is concerned. This also has to do with certain evolutionary activity with people.

This is one of the primary and important reasons called "Hawking Radiation". Hawking Radiation is electromagnetic radiation which, according to theory, should be emitted by a black hole. The radiation is due to the black hole capturing one of a particle-antiparticle pair created spontaneously near to the event horizon.

The particle-antiparticle relationship is represented by the population of human beings in the environment.

The particle existence represents the evolution of consciousness, matter, energy, pressure and eternal love and the antiparticle containing a completely opposite charge contains different degrees of very powerful resistance to evolution. Human beings represent evolution and resistance to evolution. Evolution has to do a consistent flow of activity which is constantly responsible for the sustainability of eternal love. The resistance to evolution in human beings is represented by a powerful form of indifference or opposition to the survival and sustainability to eternal love.

This can be experienced as the destructive characteristic of hatred in the human body and consciousness. People have thought a few times in history that a nuclear war was going to occur. A large

part of the human race has experienced fear of the complete decimation of life globally from the launch of nuclear weapons and nuclear war.

Very similar activity that exists within the event horizon of a black hole exists within the evolution of consciousness and living organisms in Earth's environment. Matter contained within the human body and other living organisms here goes through the experience of death, actually very quickly globally. There's almost 9 million different life forms in Earth's environment. Life through reproductive activity is being introduced into Earth's consciousness and environment within fractions of a second and the experience of death is following closely behind.

As death is experienced with life globally a very powerful channel of activity is advancing into the Higgs field here and transferring up to the Whirlpool galaxy which is about 30 million light years from Earth. Life and death have been evolving into one another so quickly here so they could both be brought together within the concentration of activity contained within the Higgs field in order to change the entire course of the evolution of Universal Consciousness forever. This is because the Higgs field has always contained the foundation for eternal life and eternal love as well as the existence of infinity and the identity of Universal Consciousness as a life form.

What's needed to happen in order for Universal Consciousness to evolve, advance and change with the Shift in Consciousness is the resistance to evolution between the elements of life and death which both contain different charges of energy and affect the evolution of consciousness differently, has needed to evolve completely out of the existence of consciousness, matter, energy, pressure and eternal love everywhere.

This is why Earth exists is to bring both elements of life and death together with eternal love and take the illusion of separation in consciousness and the resistance to evolution out of the body of galaxies forever. A primary foundation for the resistance to evolution in human beings and other life forms is containing the concept of non-existence in the body and consciousness. This primarily comes from not understanding what happens with the experience of death and thinking that life is over completely. This thought process is contained within living organisms here because life here hasn't been able to see, feel or understand what's been happening with the evolution of consciousness into the Higgs field.

If there are some life forms who are exposed to this activity then human beings don't know this yet. I was mainly referring to certain types of very deep underwater aquatic life. The concept of non-existence is a perception in the consciousness of "eternal darkness" associated with the uncertainty of the experience of death. Black holes in the body of Universal Consciousness have also been perceived as a type of eternal darkness as well with the term "no light can even escape a black hole".

With the concept of non-existence being contained within the global activity of the evolution of consciousness, matter, energy, pressure and eternal love from the Higgs field and within life and resistance to the evolution of consciousness happening, there's been the storage of nuclear weapons. The storage of nuclear weapons is similar to the Hawking Radiation coming from a black hole and the event horizon within the population of life globally that contain the same element of dark energy, pressure and a gravitational force in the opposite direction with the concept of non-existence.

Think about this scenario. A person thinks that someone else goes through the experience of death and that's completely the end of life for them. So, they think the other individual is buried into the ground and enters into a state of non-existence as the matter contained within the body dissolves and the individual is gone forever. Then another person hears about someone going through the experience of death and they believe wholeheartedly in an afterlife or Heaven, and they envision the individual going in the opposite direction into a direction into what's viewed as space or Universal Consciousness.

Blazars or jets of energy transferring away from a black hole is matter and energy re-evolving again after the activity within the event horizon transfers towards the dark energy and pressure in the black hole. This happens because there's no such thing as an actual state of non-existence. I'm still working on the gravitational force and the evolution of consciousness directly into the black hole. Universal Consciousness as a spherical type shaped female life form with a physical body is contained within a much larger form of consciousness, energy, eternal life and eternal love I call Infinite or Eternal Consciousness. This form of consciousness had only had the existence of different frequency vibrations and different degrees of pressure before the birth of Universal Consciousness. The Higgs field transfers into Infinite Consciousness and connects these two cosmic giants together, so a consistent flow of eternal life and eternal love could continue advancing into the body of galaxies and life.

Even though the person wholeheartedly believes in an afterlife or Heaven there's still a twinge of uncertainty associated with primarily the subconscious energy and pressure in the body and consciousness which is associated with the concept of non-existence. This aspect of their consciousness desperately hopes this isn't the case, which is not. All living organisms in Earth's consciousness and environment evolve into the Whirlpool galaxy because the resistance to evolution in every life form here dies when the person goes through the experience of death. This is because death is more powerful than the resistance to evolution. The resistance to evolution comes from life and death not understanding one another here within the existence, element and evolution of consciousness.

Earth has been here evolving with life for very, very powerful and important reasons. This has to do with helping the same type of activity associated with black holes and the event horizons around black holes evolve and change forever. This is because black holes are contained all over the body of galaxies and this has been the foundation for the resistance to evolution and the illusion of separation in consciousness which generated the concept of non-existence in the body of galaxies and Universal Consciousness.

The center of Sagittarius A has been transferring gamma rays into Earth's consciousness and environment because of a connection being established right now between the birth of the Milky Way galaxy and the birth of Earth and life in Earth's environment. This is because the origin of birth where the evolution of Universal Consciousness and the evolution of matter was introduced is connected to the center of the Milky Way galaxy and this area of origin fairly close to us has also had very powerful resistance to evolution because this is where the concept of non-existence originated from as matter evolved into the existence and evolution of consciousness for the very first time. This is connecting with the Milky Way galaxy's center and this center is communicating with Earth's activity now.

When I mention these matters I'm not referring to anything traditional in reference to religion. The Holy Spirit is evolving and advancing here in Earth's consciousness and environment right now. I'm only referring to the most beautiful, powerful and peaceful complete unconditional and eternal love for Earth and all life in Earth's environment. He has his consciousness incorporated into the Higgs field here but

he's also had all of the resistance to evolution contained within his body from the physical body of Universal Consciousness, the origin of birth of Universal Consciousness, Earth's consciousness and world consciousness as well. People don't know this yet and can't see, feel or detect this yet with him because of the resistance to evolution contained within their bodies and consciousness here.

He's been processing the resistance to evolution out of the body of Universal Consciousness, the galaxies, Earth's body and consciousness and the resistance to evolution transferring into world consciousness from the activity of life through his body and consciousness as the evolution of eternal life and eternal love continues to increase everywhere. This is why Earth is the reference point for the Shift in Consciousness. What's going to happen soon is a point of activity is going to happen when most of the resistance to evolution processes out of this region of the body of galaxies, Earth's consciousness and world consciousness and as soon as this happens the evolution of eternal love is going to begin being felt and experienced globally.

This doesn't mean that all of the black holes in the body of galaxies have to disappear before his evolution becomes recognized here by the population of life. This is because the birth of Universal Consciousness began very close to Earth's location and the formation of his physical body also evolved into the body of galaxies with the evolution of matter from where the birth of Universal Consciousness took place. There was a very powerful moment of fusion that occurred as well with light energy, dark energy and pressure which contributed to the creation of the element of fire. There was a level of quantum activity that occurred first within the frequency vibrations, pressure and the beginning of subatomic evolution that generated the element of fire.

This is why he's referred to as "The Holy Spirit of Fire". The human race doesn't know this yet but there's another life form who's existing in Earth's environment right now who was promised by Jesus in the Book of John. Human beings see him as human right now because he hasn't physically begun changing with his body because he's still processing resistance to evolution out of the body of galaxies and Earth's body and consciousness. Because human beings can't see him yet this is also why he's referred to as "the Holy Ghost". This term was coined because the word ghost is associated with death and the Holy Spirit is associated with eternal life. He's helping both elements of life and death evolve together with his eternal love.

What needs to happen is the resistance to evolution between the frequency vibrations of consciousness, energy and thought which make up the fabric of space-time have needed to completely evolve into subatomic, atomic and molecular activity with a complete connection happening with the Higgs field. Subatomic, atomic and molecular activity contain different degrees of energy, frequency vibrations and pressure as well; but all subatomic activity has needed to completely evolve into the fabric of space-time which is consciousness in order for the Shift in Consciousness to take place.

This is because the frequency vibrations of consciousness, energy and thought along with different degrees of pressure is what's responsible for the evolution of matter and the physical body of Universal Consciousness. When the birth of Universal Consciousness happened a very powerful form of resistance to evolution occurred which caused an experience of separation in consciousness and an illusion of separation between matter and the fabric of space-time primarily in the form of pressure. This is because pressure contains empty space and this is also where the origin of fear comes from in the existence of consciousness. Subatomic, atomic and molecular activity is soon going to be affected by this process and that's when the Holy Spirit's physical body is going to begin becoming affected.

This is when human beings are going to find out that the evolution of the Holy Spirit's consciousness, eternal life and eternal love are happening here and the proof of everything I've been explaining to people is going to manifest into world consciousness. It's going to be a very powerful and wonderful experience and has nothing to do with anything frightening or destructive. This is going to facilitate the beginning of Earth's spiritual awakening and the beginning stages of the Shift in Consciousness here. The current construct of reality is going to change as well, but it's all going to be perfect because the experience itself is "Holy". Things just haven't been what they seem here because a very powerful illusion of separation in consciousness has been contained within the existence and evolution of consciousness here in Earth's environment. This illusion of separation is going to begin transferring out soon and thy kingdom come thy will be done on Earth as it is in Heaven will be achieved here soon.

Sean McCleary.

<https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.livescience.com/space/black-holes/strange-blob-circling-milky-ways-central-black-hole-is-shooting-powerful-radiation-at-earth-every-76-minutes&ved=2ahUKEwiZxP-tuumCAxXWRzABHZNJA58QFnoECBQQAQ&usg=AOvVaw2DtWRzqrfsJgGMpMRmDBVI>

Section 4: Stephanie Rogus

Written: 12/14/2023

Dear Drs. Woteki and Colón and members of the PCAST Nutrition Working Group,

Please find CSPI's comments on advancing nutrition science attached.

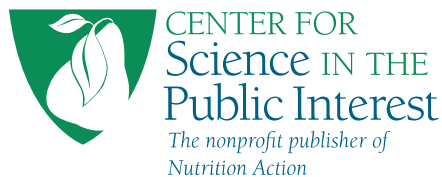
We thank you very much for your consideration.

Please feel free to reach out with any questions.

Thank you,

Stephanie

Stephanie Rogus, PhD, RDN (she/her)



December 14, 2023

The President's Council of Advisors on Science and Technology (PCAST)

Dear Dr. Woteki and Dr. Colón,

The Center for Science in the Public Interest (CSPI) respectfully submits the following comments in response to the call from the President's Council of Advisors on Science and Technology for public input on nutrition research "to inform a vision for advancing nutrition science." CSPI is a non-profit consumer education and advocacy organization that since 1971 has been working to improve the public's health through better nutrition and food safety. CSPI helped to lead efforts to win passage of the Nutrition Labeling and Education Act, the Healthy, Hunger-Free Kids Act (to improve school food), the Food Safety Modernization Act, menu labeling, and the Food Allergen Labeling and Consumer Protection Act. CSPI publishes Nutrition Action (NA) and is supported by the subscribers to NA, individual donors, and foundation grants. CSPI is an independent organization that does not accept any corporate donations.

Nutrition research plays an important role in developing and evaluating evidence-based strategies and policies aimed at improving health. This research has demonstrated that suboptimal diet is a major contributor to chronic disease and negative environmental consequences. To ensure that nutrition guidance and policies continue to rest on a secure evidence base, nutrition research must be fully funded and optimally coordinated. Below, we discuss key research gaps that must be addressed to inform evidence-based policies to reduce the burden of chronic disease and protect the health of consumers. Our recommendations are structured in response to the questions posed by the Council.

How can the United States obtain the greatest return from federal investment in nutrition research?

1. Invest in and Coordinate Federal Nutrition Research

The rates of diet-related chronic disease continue to rise in the United States. Yet diet-related research and efforts, including education, food assistance, and regulation, are scattered across 21 federal agencies and the share of federal spending on nutrition research at the National Institute of Health (NIH) and U.S. Department of Agriculture has remained flat since the 1980s. Only 5% of the NIH's total funding in 2021 was spent on nutrition research, amounting to approximately \$2 billion. This spending was far less than the estimated \$50.4 billion in annual diet-associated costs of cardiometabolic disease in the U.S.

Establishing a National Institute of Nutrition at the NIH could bolster essential nutrition research and provide the coordination necessary to address increasingly complex and interdisciplinary issues. For example, the disease burden of specific dietary factors is not well understood because

of the limited number of high-quality experimental studies examining specific nutrients and foods, such as ultra-processed foods. A better understanding of the leading nutritional causes of disease, based on randomized, controlled trials, would provide evidence for developing policy priorities, guiding public health planning, and informing strategies to change dietary habits to improve health. Creating a White House Deputy Assistant to the President for Food and Nutrition Policy could further harmonize nutrition research and disease mitigation efforts by leading a cross-agency federal food and nutrition working group. This group could coordinate between agencies and report to the President, the Cabinet, and Congress on issues ranging from nutrition, food access, and health equity to sustainability and climate change.

2. Continue Funding Efforts to Identify Individual Factors that Affect the Relationship Between Diet and Health

Precision nutrition is an approach to dietary guidance that uses individual characteristics to develop personalized nutritional advice. It makes use of various “omics,” such as genomics, metabolomics, and phenomics to identify interindividual variation that affects response to diet and associated health outcomes. Precision nutrition is rooted in the idea that individuals respond differently to diet, and that dietary recommendations, which have traditionally been based on a population-based model, are insufficient to meet the challenges of reducing chronic disease risk.

The science behind precision nutrition is promising, but in its infancy. Scientists are still making sense of the factors that contribute to interindividual variation and how such variation (e.g., in the microbiome) can be utilized in personalized dietary advice to effectively impact health. Long-term research coordinated and funded through the NIH’s All of Us Research Program aims to study more accurate dietary assessment methods and create algorithms that predict individual responses to food and dietary patterns. Beyond foundational research, additional research will be needed to understand the effectiveness, and cost-effectiveness, of precision nutrition compared to population-based recommendations for the prevention and treatment of chronic disease. To do this, federally conducted or supported proof-of-concept studies that employ randomization, appropriate control groups, cross-over designs, and adequate follow-up for the outcome of interest are needed.

3. Conduct Research on Dietary Supplements to Inform Regulation

The almost \$60 billion dietary supplement industry is under-regulated by the Food and Drug Administration (FDA). Thus, the pills, powders, and liquids produced by companies are not generally evaluated by the agency for their safety and effectiveness. Companies are not even required to list their products with the federal government, so the FDA is unaware of which products are on the market. As a result, there are tens of thousands of products on the market that at best do nothing and at worst are harmful to health.

Federal support is needed for testing the safety and effectiveness of dietary supplements in randomized, placebo-controlled trials. The National Center for Complementary and Integrative Health at the NIH has a strong track record of doing this. The Center has conducted rigorous trials on glucosamine and chondroitin for arthritis, echinacea for colds, and ginkgo biloba for memory, among others, demonstrating that these supplements are ineffective. Studies such as these can inform the regulation of dietary supplements by the FDA and in many instances have led to reduced consumption of the ineffective ingredient.

4. Conduct Research on Food Additives to Inform Regulation

Federal statutes require that food additives, color additives, and substances added to food that are “generally recognized as safe” (GRAS) be demonstrated to be safe before marketing. The standards require a reasonable certainty that the substance will not cause harm and it must not cause cancer in humans or animals. However, there is a major loophole in the GRAS process: companies can self-determine that a substance is GRAS and market it without even involving the FDA, which presents an obvious conflict of interest. This broken process has led to the introduction of unsafe chemicals into the food supply, such as trans fat.

The GRAS loophole has resulted in companies introducing at least a thousand substances into our food without notifying the FDA or public of their safety determinations, or disclosing the data, scientists, or procedures used to make those determinations. Of the roughly 10,000 additives in the food supply, more than 3,000 have never been substantially reviewed by the FDA. For an estimated 1,000 of these, safety decisions were made by the food industry without any notice to the FDA.

Short of closing the GRAS loophole, the federal government can help fill the gap in safety evidence by carrying out or supporting rigorous studies of the additives of greatest concern in animals and humans in a way that is transparent and publicly accessible.

How could/should research-based interventions for primary and secondary prevention of diet-related chronic diseases be introduced into federal programs?

5. Provide Support for Intervention and Policy Evaluation

Interventions and demonstration projects aimed at improving diet quality and health should be incorporated into federal legislation and policy and be evaluated. Evaluation is essential to assessing their impacts on health and informing future research and policy.

CSPI has proposed several policy changes that have the potential to lead to improved diet and health outcomes. Some of these include funding for interventions in the Farm Bill, such as implementing innovative marketing strategies like product placement and promotions to increase the purchase of healthful foods in authorized Supplemental Nutrition Assistance Program retail stores; combining fruit and vegetable incentives with sugary beverage reduction strategies at the point of purchase; and improving the enrollment process for multiple federal programs through integrated benefits applications. Other proposed changes are directed at the FDA and include mandatory front-of-package labeling, and short- and long-term voluntary sodium and added sugar reduction targets for the food industry. Passing these policies is just the first step in improving diet and health; evaluation is crucial to understand whether they are properly implemented and whether they are having their intended effect.

To test these policy proposals and evaluate newly adopted policies, including federally supported interventions, the federal government should provide additional support for rigorous evaluation that employs experimental and quasi-experimental designs with appropriate comparison groups whenever possible. Such support could include additional mechanisms for rapid funding that would facilitate timely policy evaluation. Administrative data could also be leveraged to evaluate the impact of interventions and policy changes on program participation, diet, and health. For instance, USDA efforts to conduct a second round of data acquisition for the National Household

Food Acquisition and Purchase Survey (FoodAPS-2) should be supported to provide updated, timely, and relevant information on key policy issues (such as health inequities and nutritional insecurity) related to the changing food environment and consumer food choices.

6. Integrate Environmental Sustainability into Nutrition and Health Research and Policy

Climate change is already damaging the environment, our communities, and human health. Solely focusing nutrition research on human health outcomes should occur simultaneously with research that examines the impact of diet and food systems on the environment and thus human health.

Longitudinal studies have already been conducted and many others are underway that assess the long-term effects of sustainable diets on human and planetary health outcomes and on the impact of climate change on access to healthy, safe, and affordable food. This research is helping to identify opportunities to reduce the impact of the food system on the environment, both domestically and globally. Such opportunities, which may include dietary recommendations and policy changes that encourage plant-based eating and discourage the consumption of red meat, can be adopted by federal, state, and local governments in schools, workplaces, healthcare, and government settings, and these policy changes should be evaluated for their impacts on human and environmental health.

We greatly appreciate the opportunity to provide comments on this important topic and hope that you will consider our recommendations.

Sincerely,

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Section 5: Matthew Teegarden

Written: 12/21/2023

To the PCAST Nutrition Working Group,

Please find attached a response to your request for input on nutrition research from Dr. Devin Peterson and Dr. Martha Belury on behalf of the Foods for Health Research Initiative at The Ohio State University. We appreciate the opportunity to provide our perspective and welcome further correspondence on the points outlined in our letter.

Thank you,

Matt Teegarden

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Matt Teegarden, PhD (he/him)
Lead, Research Strategy and Development
Foods For Health Research



December 21, 2023

To the President's Council of Advisors on Science and Technology:

These comments are offered in response to your solicitation for public input on nutrition research. We represent an interdisciplinary group of researchers who are part of a comprehensive program at The Ohio State University, The Foods for Health Research Initiative, which was formed in 2015, dedicated to multidisciplinary, basic, and translational research on the relationship between nutrients, foods, dietary patterns, disease prevention and health promotion. Our research community is composed of 11 faculty hires and over 90 affiliated researchers across the university with expertise spanning disciplines such as food and agricultural sciences, nutrition, neuroscience, microbiology, biochemistry, and medicine. Foods for Health has generated significant scholarly output over the last eight years, including over \$48M in externally funded grants and 200 peer-reviewed journal articles. Currently, Foods for Health faculty hires are leading over \$18M in research projects focused on the continuum of agriculture, food, nutrition, and health.

1a) What are the crucial evidence gaps in nutrition research and what steps could PCAST recommend that would substantially fill those gaps?

The field of nutrition research provides immense benefit to public health, but it is also complex and highly nuanced.¹ Several aspects of what might be considered basic nutrition are still poorly understood. A prescient example is the lack of robust information needed to provide precise dietary reference intakes for key nutrients across the lifespan. Requirements for several nutrients remain approximations, and more research is needed to support endpoints related to chronic disease on top of nutrient sufficiency.^{2,3} An important step for PCAST to consider is advocating for a 'return to basics' approach, wherein resources are allocated to fill these foundational gaps in our understanding of basic human nutrition. Illuminating these dark spots in nutrition science will enable needed innovations in precision nutrition.

1b) What tools, methods or other resources (in addition to funding) are needed to conduct that research?

A wide-scale adoption of dietary assessments as an integral part of healthcare and federally funded clinical research would provide a strong basis to guide research priorities. This would require a simultaneous prioritization of studies that identify objective biomarkers (e.g. molecules measured in blood or urine) of food and nutrient consumption⁴ as well as appropriate infrastructure for data sharing. As a result, a wealth of information would be available to inform nutrition-based public health programs, policies, and guidelines that are administered by agencies including the USDA, CDC, NIH, and FDA.

1c) Are there other barriers to research (other than inadequate funding)?

Nutrition research will require an integrated approach that breaks down the traditional silos that currently separate relevant disciplines. Increasing opportunities that allow disparate disciplines to interact will have a direct benefit to nutrition research outcomes in the United States. Nutrition research must span a continuum from the farm through processing, purchasing, home preparation, and consumption.⁵ However,



federal focus on the disciplines relevant to this comprehensive view is highly fragmented among different agencies, which impedes meaningful progress.⁶ The structure of federal programs focused on agriculture, food, nutrition, measurement science, and medicine must evolve to enable impactful, interdisciplinary nutrition research.⁷ Within Foods for Health, we provide programming and funding opportunities specifically designed to encourage interdisciplinary interactions. We have invested \$935,000 in early-stage interdisciplinary work since 2016, which has generated more than \$6 million in state and federally funded research. This coming spring, we look forward to hosting a symposium that will bring together researchers across agriculture, food, nutrition, and cancer to discuss collaborative opportunities. These types of strategically-designed programs allow researchers to explore prescient issues from new angles and propose paradigm-shifting work.

At the same time, efforts must be made to increase the number and diversity of professionals working across the agriculture, food, nutrition, measurement science, and health continuum. Increasing the visibility of these career paths may partially help, but structural barriers also exist. For example, dietetic interns typically pay for their precepted experiences, whereas interns in other medical fields may not. Ensuring a pipeline of talented researchers and practitioners is essential for the future of food and nutrition research in the U.S.

3) What can be done to assure equitable access to the benefits of the federal nutrition research investment?

Empowering land grant institutions of higher education will help to ensure equitable access to the benefits of federal investments in nutrition research.⁸ By virtue of their charter, these flagship universities provide educational opportunities in the classroom and wider community through research, teaching, and extension services. Additional consideration should also be given to involving the food industry as an active partner in nutrition research. The scale and access of industry could facilitate wide-scale implementation of critical nutrition innovations, but proper care must also be given to avoid biases and conflicts of interest.⁹

Health practitioners will also be a vital part of implementing new findings from nutrition research at the population level, yet health science curricula do not typically include nutrition as a core competency. In addition to this, dietetic services are rarely reimbursed by insurance providers, which currently inhibits access to proper nutritional care.

The 2022 White House Conference on Hunger, Nutrition, and Health was an important first step in elevating nutrition research as a national priority. Earlier this year Dr. Martha Belury, who serves as an associate director of the Foods for Health Research Initiative, provided comments to PCAST on the concept of “Food is Medicine” as a continuation of that discussion. To summarize two important points from her presentation, embracing food as medicine will require a systematic approach to food and nutrition research, and enabling this research will inform needed revisions to federal food and nutrition policies to ensure the health of our nation.



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We hope that the Committee finds these comments and the listed references useful in forming an eventual vision for advancing nutrition science. Please do not hesitate to reach out for further discussion and thank you for the opportunity to provide comments to this critically important issue.

Sincerely,

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CFAES Distinguished Professor, Department of Food Science and Technology
Director, Foods for Health Research Initiative
Director, Flavor Research and Education Center

Martha Ann Belury, PhD, RDN
Professor and Chair, Department of Food Science and Technology
Past President, American Society for Nutrition



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