The Lord is like a strong tower, where the righteous can go and be safe.
Proverbs 18:10

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Nagmamalasakit sa lalawigan

Be alert, stand firm in the faith, be brave, be strong.
1 Corinthians 16:13

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Ospital ng Imus hits full capacity; to check COVID-19 patients inside vehicles, outside ER

IMUS CITY, Cavite — Ospital ng Imus announced last April 14 that its emergency room and ward have reached full capacity for suspect, probable, and confirmed COVID-19 cases.

In a public advisory, the hospital management said COVID-19 patients who will be taken to the hospital at this time can still be checked by doctors but only outside the ER or inside the patient's vehicle.

Meanwhile, the hospital can still accommodate patients with conditions that are not related to COVID-19.

No acceptance of new patients for a week - Jonvic

TRECE MARTIRES CITY, Apr. 16 –Gov. Jonvic Remulla stated that eight provincial and city hospitals will not accept new patients for a week.

This was declared in the wake of the CoViD-19 infection among several health care workers in medical facilities.

"One week kami nag-decide hindi muna (tatanggap ng pasyente) hangga't malaman namin ang sitwasyon," said Remulla.

About 38 hospital medical staff located in the cities of Bacoor, Dasmariñas, Trece Martires, and in the municipalities of Kawit, Maragondon, and General Mariano Alvarez (GMA) tested positive of CoViD-19 disease.

Due to this, medical facilities are now understaffed and remaining health care workers will be overwhelmed with the influx of patients if the hospitals continue to accept new patients.

Moreover, private hospitals in the province are also at a critical level with occupancy rate reaching 95 percent according to the governor.

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Most differences in DNA binding compounds found at birth in children conceived by IVF not seen in early childhood

Compared to newborns conceived traditionally, newborns conceived through in vitro fertilization (IVF) are more likely to have certain chemical modifications to their DNA, according to a study by researchers at the National Institutes of Health. The changes involve DNA methylation -- the binding of compounds known as methyl groups to DNA -- which can alter gene activity. Only one of the modifications was seen by the time the children were 9 years old.

The study was conducted by Edwina Yeung, Ph.D., and colleagues in NIH's Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD). Previous studies by the research team found no differences in growth and development for this group.

"Our study found only small differences in DNA methylation at birth and these were not seen in early childhood," Dr. Yeung said. "When considered along with our previous studies finding no differences in children's growth and development, our current study should be reassuring to couples who have conceived with fertility treatments and to those considering these methods."

IVF consists of collecting eggs and sperm, fertilizing the eggs in a lab, and then transferring the resulting embryo or embryos into the uterus. Another technique, intracytoplasmic sperm injection (ICSI), consists of injecting a sperm cell directly into the egg before placing the resulting embryo into the uterus.

Methylation changes were not associated with two other fertility treatments, ovulation induction (drug treatment to release the egg from the ovary) and intrauterine insemination (insertion of semen directly into the uterus).

According to a national report in 2018, almost 75,000 IVF-conceived infants (2.0% of all infants) were born in the United States. Of these, approximately 76% were conceived with ICSI. Another study found that 3 to 7% of births resulted from ovulation induction and intrauterine insemination.

When methyl groups are added to a gene, the gene is switched off and does not produce a protein. Methyl groups are added and removed from DNA throughout life, as genes are alternately switched on and off. Changes in methylation may occur in any step of IVF.

New way to monitor and prevent nerve cell deterioration after TBI

Violent blows or jolts to the head can cause traumatic brain injury (TBI), and there are currently about five million people in the U.S. living with some form of chronic impairment after suffering a TBI. Even in a mild form, TBI can lead to lifelong nerve cell deterioration associated with a wide array of neuropsychiatric conditions. Tragically, there are no medicines to protect nerve cells after injury. Behind aging and genetics, TBI is the third leading cause of Alzheimer's disease (AD), yet the link between these two conditions is not understood.

In a new study, published online April 13, 2021 in Cell, researchers have discovered a new way to prevent brain nerve cells from deteriorating after injury, which also revealed a potential mechanistic link between TBI and AD.

Republic of the Philippines
REGIONAL TRIAL COURT
Fourth Judicial Region
Branch 20
Imus, Cavite

Republic of the Philippines,
Represented by the Dept of Public Works
And Highways (DPWH)
Plaintiff

-versus-

CIVIL CASE NO. 6774-18
For: Expropriation
(Lot 3294, CAD-203-D)

JOHN DOE
Defendant,

x----------x

SUMMONS
(By Publications)

TO: JOHN DOE

GREETINGS:

WHEREAS, on March 13, 2018, plaintiff thru counsel Filed a Complaint (with Urgent Prayer for the Issuance of a Writ of Possession) which read as follows:

Republic of the Philippines
REGIONAL TRIAL COURT
Fourth Judicial Region
Branch 20
Imus, Cavite

Republic of the Philippines,
Represented by the Dept of Public Works
And Highways (DPWH)
Plaintiff

-versus-

CIVIL CASE NO. 6774-18
For: Expropriation
(Lot 3294, CAD-203-D)

JOHN DOE
Defendant,

x----------x

COMPLAINT
(With Urgent Prayer for the Issuance of a Writ of Possession)

Plaintiff REPUBLIC OF THE PHILIPPINES, represented by the DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS (DPWH), through the OFFICE OF THE SOLICITOR GENERAL (OSG), to this Honorable Court, respectfully states:

1. Plaintiff is a sovereign political entity with capacity to sue and is vested with the power and authority to condemn and expropriate private property for public use upon payment of just compensation. The Republic is exempt from payment of fees pursuant to Rule 141, Sec. 22 of the Rules of Court. It is represented herein by the DPWH, a government agency authorized to expropriate property by virtue of Republic Act No. 10752, entitled "An Act Facilitating the Acquisition of Right-of-Way Site or Location for National Government Infrastructure Projects" and may be notified through the Office of the Solicitor General (OSG) at 134 Amorsolo St. Legaspi Village, Makati City.

2. Defendant is herein denominated as John Doe, pursuant to Sec. 14, Rule 3 of the Revised Rules of Civil Procedure, since the owner of the Property is unknown and cannot be verified despite due diligence exerted to determine his/her identity/ identities and whereabouts.

3. Plaintiff has embarked on the Cavite-Laguna Expressway (CALAX) construction project to provide an efficient, fast, and safe road network and to spur national economic development, particularly in the provinces of Cavite and Laguna.

4. Plaintiff needs Seven Hundred Eleven (711) square meters of Lot 3294, CAD-203-D for the CALAX whole project is defined as the shaded portion of the Percellary Survey, hereto attached as Annex "A". The portion of the project affecting the property of defendant is delineated in the Subdivision Plan of Land of Lot 3294, hereto attached as Annex "B". There are no improvements or structures found on the subject lot, as shown by a photograph hereto attached as Annex "C"

5. The current relevant zonal valuation by the Bureau of Internal Revenue (BIR) of real properties, situated in Kawit, Cavite including the subject property, is ONE HUNDRED FIFTY PESOS (PHP 150.00) per square meter, as shown by the property valuation of the Revenue District Office in Bacoor City, hereto attached as Annex "D". The total cost of the property needed by Plaintiff, therefore, is ONE HUNDRED SIX THOUSAND SIX HUNDRED FIFTY PESOS (PHP 106,650.00).

6. The CALAX project is covered by a pending application for an Environmental compliance Certificate (ECC) pursuant to Presidential Decree No. 1586 and Department of Environment and Natural Resources Administrative Order No. 2003-30. Evidence of said application letter is a Letter dated February 24, 2017, hereto attached as Annex "E", sent by DPWH to DENR regarding its request for the issuance of an ECC and the Memorandum of Agreement between DPWH, UP Planades and MPCALA, hereto attached as Annex "F".

7. Plaintiff acquisition of the subject property is indispensable to the CALAX Project. Said Property has neither been devoted to nor expropriated for any other public use. The CALAX Project is being promoted in a manner compatible with the greatest public good and with the least injury to private property.

8. Pursuant to Section 6 of R.A. 10752, plaintiff is ready to deposit the amount of ONE HUNDRED SIX THOUSAND SIX HUNDRED FIFTY PESOS (PHP 106,650.00) the amount equivalent to 100% of the current relevant BIR zonal value of the affected area of the subject lot. The corresponding check, payable to the benefit of the person to be adjudged and determined in the same proceedings as the owner who is entitled thereto, is available and will be deposited with this Honorable Court as a requisite for the issuance of the Writ of Possession. Evidence thereof is the Special Allotment Release Order (SARO) hereto attached as Annex "G", indicating total funds earmarked for the CALAX Project.

9. Pursuant to Section 112 of C.A. 141, as amended, the taking for public use of an easement of a right of way is subject to the payment of just compensation for any improvements affected, thus, plaintiff posted a notice on the subject area. This is evidence by a photograph of the notice, hereto attached as Annex "H"

10. Plaintiff is exempt from paying the docket, filing, and other legal fees pursuant to Section 22, Rule 141 of the Revised Rules of Court.

ALLEGATIONS IN SUPPORT OF THE URGENT PRAYER FOR THE ISSUANCE OF WRIT OF POSSESSION

11. In Capital Steel Corporation vs. Provident Industrial Authority, the Supreme Court held that the issuance of a writ of possession is a ministerial duty that the Honorable Court upon plaintiff's compliance with the guidelines set forth by law, thus:

> Upon compliance with the requirements, a petitioner in an expropriation case, in this case the respondent, is entitled to a writ of possession as a matter of right and its becomes the ministerial duty of the trial court to forthwith issue the writ of possession. No hearing is required and the court neither exercises an discretion or judgement in determining the amount of the provisional value of the properties to be expropriated as the legislature has fixed the amount under Section 4 of R.A. No. 8974 (Emphasis supplied)

12. It is also imperative for the protection of the interest of the government vis-a-vis its real rights over the subject property that the corresponding Order of Expropriation be issued and entered in the Primary Entry Book of the Registry of Deeds of Cavite City and, thereafter, be annotated in the space provided in its Registration Book pursuant to Section 69 of P.D. 1529, otherwise known as the Property Registration Decree, which states:

> Section 69. Attachments – An attachment, or a copy of any writ, order of process issued by a court of record, intended to create or preserve any claim, status, right, or attachment upon registered land shall be filed and registered in the Registry of Deeds for the province or city in which the land lies, and, in addition to the particulars required in such papers for registration, shall contain a reference to the number of the certificate of title to be affected and the registered in the Registry of Deeds for the province of city in which the land lies, and, in addition to the particulars required in such papers for registration, shall contain a reference to the number of the certificate of title to be affected and the registered owner of owners thereof, and also if the attachment, order, process or lien is not claimed on all the land, or any certificate of title a description sufficiently accurate for identification of the land or interest to be affected. A restraining order, injunction or mandamus issued by the court shall be entered and registered on the certificate of title affected, free of charge.

13. To ensure that the subject property is free from statutory liens, it is necessary that defendant be required to present proof of payment of the corresponding realty taxes before this Honorable Court orders the release in their favor of any amount deposited by plaintiff.

PRAYER

WHEREFORE, plaintiff respectfully prays that the Honorable Court:

1. ISSUE a Writ of Possession upon plaintiff's deposit of the amount equivalent to the replacement cost of structures or improvements, if any;

2. ISSUE an Order of Expropriation,
(a) Condemning the affected area of the subject lot for public use and for the public purpose set forth herein, and
(b) Directing the Register of Deeds of Cavite City to register the Order of Expropriation issued by this Honorable Court in the Corresponding Certificate of Title, if any, the Primary Entry Book, and the Registration Book;
3. SET a hearing for the presentation of defendants proof of identity and ownership of the subject lot after fifteen (15) days from service of summons upon them, and at said hearing;
(a) Direct defendant to submit sufficient proof of their identity and ownership of the subject lot, as well as updated payment of all requisite taxes and fees to the relevant local and national government agencies, including but not limited to real property taxes on the subject lot; and
(b) Release the check deposited with this Honorable Court to defendant, subject to clearance from plaintiff of defendant's satisfaction or completion of the requirements of proof of identity, ownership, and payment of relevant government taxes and fees, in accordance with Section 6 of R.A. 10752 and its IRR, and Commission on Audit requirements;
4. ISSUE an order directing the Register of Deeds of Cavite City to register and annotate the Writ of Possession issued by this Honorable Court in the corresponding Certificate of Title, if there is any, the Primary Entry Book, and the Registration Book;
5. AUTHORIZE and ORDER the payment of just compensation to defendant after deducting the sum due for capital gains tax, unpaid real property taxes and other taxes and fees due the Government, if any, and/or ORDER defendant to return to plaintiff whatever amount it may have received in excess of the just compensation as determined by this Honorable Court;
6. ORDER defendant to turnover to plaintiff the corresponding owner's duplicate Certificate of Title, should there be any, over the subject lot; and
7. Accordingly, DIRECT the Register of Deeds of Cavite City to effect the transfer ownership of the affected area of the subject lot to plaintiff and to issue the corresponding Certificate of Title in the name of the Republic of the Philippines.

Other just and equitable reliefs are likewise prayed for.

Makati City for Imus, Cavite, February 26, 2018.

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Solicitor General
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IBP Lifetime No. 015360; 8-18-16
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Roll No. 57361/IBP No. 009153, 06-09-17
MCLE Compliance No. V-0008846

OFFICE OF THE SOLICITOR GENERAL
134 Amorsolo St. Legaspi Village,
Makati City.
Tel. No. 8186581 loc. 329
Telefax 895-46-82

EXPLANATION
(Pursuant to Section 11, Rule 13 of the 1997 Rules of Civil Procedure)
The foregoing complaint is being served by registered mail; personal service not being practicable due to lack of manpower.

CAMILLE R. BUHAIN
Solicitor General

VERIFICATION AND CERTIFICATION

I, ENGR. ALEX G. BOTE, Director, Public-Private Partnership Service (PPPS), Department of Public Works and Highways, with office address at 3rd Floor, DPWH Main Building, Port Area, Manila, after having been duly sworn in accordance with law, depose and state that:

1. I am authorized to initiate the present complaint for Expropriation pursuant to Department Order No. 65, Series of 2017, in relation to the DPWH Secretary' Special Order No. 38 Series of 2017;
2. I have caused the preparation and filing of the aforesaid complaint and have read and understood all the allegations contained therein, and the same are true and correct as of my personal knowledge and/or based on authentic records;
3. I have not commenced any action or filed any claim involving the same issue in any court, tribunal, or quasi-judicial agency; and 4. Should I thereafter learn that a same or similar action has been filed or pending, I undertake to promptly report such fact to the Honorable Court within five (5) days from knowledge thereof.

IN WITNESS WHEREOF, I have set my hand and affixed my signature this 26th day of February 2018 in Makati City, Philippines.

ENGR. ALEX G. BOTE
Director
Public-Private Partnership Service DPWH

SUBSCRIBED AND SWORN to before me this 26th day of February 2018 at Makati City with affiant exhibiting to me this DPWH ID No. 95Z0012,a photocopy of which is attached hereto.

Melizza F. Favonto-Mendoza
State Solicitor

WHEREAS on December 03, 2020, Plaintiffs through the Office of the Solicitor General filed a Motion for leave of Court to Serve Summons by Publication which this Court granted in its Order dated December 9, 2020.

NOW, THEREFORE, defendant are required to file with this Court, within thirty (30) days from the last date of publication of this Summons, their Answer to the Petition.

City of Imus, Cavite, March 19, 2021

(Sgd) MARIE JEAN MANIÑGAS
Branch Clerk of Court

Publication: DIYARYO KABITENYO
Dates: April 19, 26 and May 3, 2021

Dietary cocoa improves health of obese mice; likely has implications for humans

Supplementation of cocoa powder in the diet of high-fat-fed mice with liver disease markedly reduced the severity of their condition, according to a new study by Penn State researchers, who suggest the results have implications for people.

Cocoa powder, a popular food ingredient most commonly used in the production of chocolate, is rich in fiber, iron and phytochemicals reported to have positive health benefits, including antioxidant polyphenols and methylxanthines, noted study leader Joshua Lambert, professor of food science in the College of Agricultural Sciences.

"While it is typically considered an indulgence food because of its high sugar and fat content, epidemiological and human-intervention studies have suggested that chocolate consumption is associated with reduced risk of cardio-metabolic diseases including stroke, coronary heart disease and Type 2 diabetes," Lambert said. "So, it made sense to investigate whether cocoa consumption had an effect on non-alcohol-related fatty liver disease, which is commonly associated with human obesity."

This study has several strengths, Lambert explained. It used a commercially available cocoa product at a "physiologically achievable dose" -- meaning its equivalent could be duplicated by humans.

The chillest ape: How humans evolved a super-high cooling capacity

Humans have a uniquely high density of sweat glands embedded in their skin — 10 times the density of chimpanzees and macaques. Now, researchers at Penn Medicine have discovered how this distinctive, hyper-cooling trait evolved in the human genome. In a study published April 14, 2021 in the Proceedings of the National Academy of Sciences, researchers showed that the higher density of sweat glands in humans is due, to a great extent, to accumulated changes in a regulatory region of DNA — called an enhancer region — that drives the expression of a sweat gland-building gene, explaining why humans are the sweatiest of the Great Apes.

"This is one of the clearest examples I've ever seen of pinpointing the genetic basis for one of the most extreme and distinctively human evolutionary traits as a whole," said the study's senior author, Yana Kamberov, PhD, an assistant professor of genetics at Penn Medicine. "This kind of research is important not only because it shows how evolution actually works to produce species diversity but also because it gives us access into human biology that is often not possible to gain in other ways, essentially by learning from tweaking the biological system in a way that is actually beneficial, without breaking it."

Scientists broadly assume that humans' high density of sweat glands, also called eccrine glands, reflects an ancient evolutionary adaptation. This adaptation, coupled with the loss of fur in early hominins, which promoted cooling through sweat evaporation, is thought to have made it easier for them to run, hunt, and otherwise survive on the hot and relatively treeless African savannah, a markedly different habitat than the jungles occupied by other ape species.

Kamberov found in a 2015 study that the expression level of a gene called Engrailed 1 — EN1 in humans — helps determine the density of eccrine glands in mice. EN1 encodes a transcription factor protein that, among many other functions, works during development to induce immature skin cells to form eccrine glands. Because of this property, Kamberov and colleagues hypothesized that perhaps one way in which humans could have built more sweat glands in their skin is to evolve genetic changes that increased the production of EN1 in the skin.

The activity of a gene is often affected by nearby regions of DNA called enhancer regions, where factors that activate the gene can bind and help drive the gene's expression. In the study, Kamberov and her team identified an enhancer region called hECE18 that boosts the production of EN1 in skin, to induce the formation of more eccrine glands. The researchers showed that the human version of hECE18 is more active than that of ape or macaque versions, which would in turn drive higher levels of EN1 production.

Kamberov and her colleagues also teased apart the individual mutations that distinguish human hECE18, showing why some of them boost EN1 expression — and showing that rolling back those mutations to the chimp version of hECE18 brings the enhancer activity down to chimp levels.

Prior studies of evolved human-specific traits, such as language, generally have tied such traits to complex genetic changes involving multiple genes and regulatory regions. In contrast, the work from Kamberov and her team suggest that the human "high-sweat" trait evolved at least in part through repeated mutations to just one regulatory region, hECE18. This means that this single regulatory element could have repeatedly contributed to a gradual evolution of higher eccrine gland density during human evolution.

While the study is mainly a feat of basic biology that shines a light on human evolution, it also should have some long-term medical relevance, Kamberov said.

Suppression of COVID-19 waves reflects time-dependent social activity, not herd immunity

Scientists at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory and the University of Illinois Urbana-Champaign (UIUC) have developed a new mathematical model for predicting how COVID-19 spreads. This model not only accounts for individuals' varying biological susceptibility to infection but also their levels of social activity, which naturally change over time. Using their model, the team showed that a temporary state of collective immunity — what they coined "transient collective immunity" — emerged during early, fast-paced stages of the epidemic. However, subsequent "waves," or surges in the number of cases, continued to appear because of changing social behaviors. Their results are published in the Proceedings of the National Academy of Sciences.

The COVID-19 epidemic reached the United States in early 2020, rapidly spreading across several states by March. To mitigate disease spread, states issued stay-at-home orders, closed schools and businesses, and put in place mask mandates. In major cities like New York City (NYC) and Chicago, the first wave ended in June. In the winter, a second wave broke out in both cities. Understanding why initial waves end and subsequent waves begin is key to being able to predict future epidemic dynamics.

Here's where modeling can help. But classical epidemiological models were developed almost 100 years ago. While these models are mathematically robust, they don't perfectly capture reality. One of their flaws is failing to account for the structure of person-to-person contact networks, which serve as channels for the spread of infectious diseases.

'Classical epidemiological models tend to ignore the fact that a population is heterogenous, or different, on multiple levels, including physiologically and socially,' said Alexei Tkachenko, a physicist in the Theory and Computation Group at the Center for Functional Nanomaterials (CFN), a DOE Office of Science User Facility at Brookhaven Lab. "We don't all have the same susceptibility to infection because of factors such as age, preexisting health conditions, and genetics. Similarly, we don't have the same level of activity in our social lives. We differ in the number of close contacts we have and in how often we interact with them throughout different seasons. Population heterogeneity — these individual differences in biological and social susceptibility — is particularly important because it lowers the herd immunity threshold."

Herd immunity is the percentage of the population who must achieve immunity in order for an epidemic to end.

"Herd immunity is a controversial topic," said Sergei Maslov, a CFN user and professor and Bliss Faculty Scholar at UIUC, with faculty appointments in the Departments of Physics and Bioengineering and at the Carl R. Woese Institute for Genomic Biology. "Since early on in the COVID-19 pandemic, there have been suggestions of reaching herd immunity quickly, thereby ending local transmission of the virus. However, our study shows that apparent collective immunity reached in this way would not last."

"What was missing prior to this work was that people's social activity waxes and wanes, especially due to lockdowns or other mitigations," added Nigel Goldenfeld, Swanlund Professor of Physics and director of the NASA Astrobiology Institute for Universal Biology at UIUC. "So, a wave of the epidemic can seem to die away due to mitigation measures when the susceptible or more social groups collectively have been infected — what we call transient collective immunity. But once these measures are relaxed and people's social networks are renewed, another wave can start, as we've seen with states and countries opening up too soon, thinking the worst was behind them."

Ahmed Elbanna, a Donald Biggar Willett Faculty Fellow and professor of civil and environmental engineering at UIUC, noted transient collective immunity has profound implications for public policy.

A mother's fat intake can impact infant infectious disease outcomes

A team of UBC Okanagan researchers has determined that the type of fats a mother consumes while breastfeeding can have long-term implications on her infant's gut health.

Dr. Deanna Gibson, a biochemistry researcher, along with Dr. Sanjoy Ghosh, who studies the biochemical aspects of dietary fats, teamed up with chemistry and molecular biology researcher Dr. Wesley Zandberg. The team, who conducts research in the Irving K. Barber Faculty of Science, explored the role of feeding dietary fat to gestating rodents to determine the generational effects of fat exposure on their offspring.

"The goal was to investigate how maternal dietary habits can impact an offspring's gut microbial communities and their associated sugar molecule patterns which can be important in immune responses to infectious disease," says Dr. Gibson, who studies gut health and immunity as well as causes of acute or chronic diseases like inflammatory bowel disease.

Their study suggests that the type of fat consumed during breastfeeding could differentially impact an infant's intestinal microbial communities, immune development and disease risk.

The three main classes of fatty acids include saturated (SFA), found in meats and dairy products, monounsaturated fats (MUFA), found in plant-based liquid oils, and polyunsaturated fatty acids (PUFAs), found in some nuts, fish and shellfish. PUFAs are further characterized as either n-3 PUFAs or n-6 PUFAs, based on the number and positions of double bonds in the acyl chain.

Previous research has determined both n-3 PUFAs and n-6 PUFAs can have a negative impact on intestinal infections such as Enteropathogenic E. coli, Clostridium difficile, salmonella and gastrointestinal illnesses from eating poorly prepared or undercooked food or drinking contaminated water. In contrast, diets rich in MUFAs and SFAs have been shown to be largely protective against these infections.

Dr. Gibson's latest research states the beneficial properties of milk fat, or saturated fats, during the pre-and postnatal period might improve protection against infectious intestinal disease during adulthood particularly when a source of n-3 PUFAs are combined with saturated fats.

"Our findings challenge current dietary recommendations and reveal that maternal intake of fat has tranagenerational impacts on their offspring's susceptibility to intestinal infection, likely enabled through microbe-immune interactions," says Dr. Gibson.

Global consumption of unsaturated fatty acids has increased significantly between 1990 and 2010, she adds, while people are consuming lower amounts of saturated fats during pregnancy because of recommendations to reduce saturated fat intake.

"Although it has been known for decades that high-fat diets can directly alter inflammatory responses, recent studies have only just begun to appreciate how fatty acid classes may have discrete effects on inflammation, and can shift host responses to an infection," says Dr. Gibson.

Dietary fatty acids can impact inflammatory processes including defensive inflammatory responses following an intestinal infection. This can affect the severity of disease, making dietary fatty acids an important consideration in predicting disease risk, Dr. Gibson explains.

Researchers believe it's a combination of dietary fat-host interactions with the intestinal bacteriome that can determine the severity of these infections. The intestinal bacteriome, Dr. Gibson explains, is established during infancy and plays a critical role in aiding immune system maturation and providing a barrier against colonization with potential pathogens.

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Inside the protein channel that keeps bacteria alive

Almost all bacteria rely on the same emergency valves — protein channels that pop open under pressure, releasing a deluge of cell contents. It is a last-ditch effort, a failsafe that prevents bacteria from exploding and dying when stretched to the limit. If we understood how those protein channels worked, antibiotic drugs could be designed to open them on demand, draining a bacterium of its nutrients by exploiting a floodgate common to many species.

But these channels are tricky to operate in the lab. And how precisely they open and close, passing through a sub-conducting state and ending in a desensitized state under the influence of mechanical forces, remains poorly understood. Now, new research from the laboratory of Rockefeller's Thomas Walz introduces a novel method to activate and visualize these channels, making it possible to explain their function. The findings shed light on key membrane proteins in bacteria, and the same method can be used to improve our understanding of similar channels in humans.

"We were actually able to see the entire cycle of the protein channel passing through a series of functional stages," Walz says.

Walz has long focused upon MscS, a protein embedded in bacterial membranes that opens in response to mechanical force. MscS proteins exist in a closed state while resting in a thick membrane. Scientists once suspected that, when fluid build-up causes the cell to swell and puts tension on the membrane, it stretches so thin that its proteins protrude.

Scientists identify severe asthma species, show air pollutant as likely contributor

Asthma afflicts more than 300 million people worldwide. The most severe manifestation, known as non-Th2, or non-atopic childhood asthma, represents the majority of the cases, greater than 85%, particularly in low-income countries, according to Hyunok Choi, an associate professor at the Lehigh University College of Health. Yet, whether non-Th2 is a distinct disease (or endotype) or simply a unique set of symptoms (or phenotype) remains unknown.

"Non-Th2 asthma is associated with very poor prognosis in children and great, life-long suffering due to the absence of effective therapies," says Choi. "There is an urgent need to better understand its mechanistic origin to enable early diagnosis and to stop the progression of the disease before it becomes severe."

Studies show that nearly 50% of the children whose asthma is poorly controlled are expected to emerge as severe adult cases. Yet, a one-size-fits-all treatment approach, currently the norm for asthma, is ineffective and, says Choi, and partially responsible for asthma's growing economic burden.

"The primary reason for lack of therapeutic and preventive measures is that no etiologic, or causal, driver has ever been identified for the non-Th2 asthma," says Choi.

Now, for the first time, an epidemiological study, led by Choi, has shown that not only is non-Th2 a distinct disease, its likely inducer is early childhood exposure to airborne Benzo[a] pyrene, a byproduct of fossil fuel combustion. Choi and her colleagues are the first to demonstrate air pollution as a driver of the most challenging type of asthma, the severe subtype which is non-responsive to current therapies.

The team describes their results in an article recently published online in Environmental Health Journal called "Airborne Benzo[a] Pyrene May Contribute to Divergent Phenotypes in Children."

What is termed asthma is an umbrella word for multiple diseases with common symptoms. Asthma has been broadly classified as two major sets of symptoms: T helper cell high (Th2-high) and T helper cell low (non-Th2). Th2-high is associated with early-childhood allergies to common pollutants such as pet dander, tree pollens, or mold. In contrast, non-TH2 is not related to an allergic response.