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- 1. Promising probiotic treatment for inflammatory bowel disease**
- 2. Link examined between omega-3 fatty acid levels and biological aging**
- 3. Retail meat linked to urinary tract infections: Strong new evidence**
- 4. Stain repellent chemical linked to thyroid disease in adults**
- 5. High vitamin D levels linked to lower risk of colon cancer**
- 6. New study: Human running speeds of 35 to 40 mph may be biologically possible**
- 7. Low-carb diet effective at lowering blood pressure**
- 8. Study links reduced fertility to flame retardant exposure**
- 9. Magnesium supplement helps boost brainpower**
- 10. Pomegranate extract stimulates uterine contractions**
- 11. Vitamin D supplements could fight Crohn's disease**
- 12. Common antidepressant drugs linked to lactation difficulties in moms**

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Promising probiotic treatment for inflammatory bowel disease

Bacteria that produce compounds to reduce inflammation and strengthen host defences could be used to treat inflammatory bowel disease (IBD). Such probiotic microbes could be the most successful treatment for IBD to date, as explained in a review published in the February issue of the Journal of Medical Microbiology.

IBD is inflammation of the gastro-intestinal tract that causes severe watery and bloody diarrhoea and abdominal pain. It is an emerging disease that affects 20 out of 100,000 genetically susceptible people in Europe and North America. The most common manifestations of IBD are Crohn's disease and ulcerative colitis. While the exact causes are unclear, IBD is known to be the result of an overactive immune response that is linked to an imbalance of the normal types of bacteria found in the gut.

Several recent studies have identified butyric acid as a potential therapeutic agent for IBD. Some gut bacteria produce butyric acid naturally in the intestines, but in IBD patients some of these strains are heavily depleted. Trials in mice have shown that injecting one such strain *Faecalibacterium prausnitzii* into the digestive tract is effective at restoring normal levels of gut bacteria and treating the symptoms of IBD. In addition, novel identified butyrate-producing strains, such as *Butyricicoccus pullicaecorum*, have been shown to exert similar effects.

Butyric acid has well-known anti-inflammatory effects and is able to strengthen intestinal wall cells - making it an ideal therapeutic agent against IBD. In addition to butyric acid, it is hypothesized that strains such as **F. prausnitzii and B.pullicaecorum** secrete other anti-inflammatory compounds that may enhance the therapeutic effect.

Prof. Filip Van Immerseel, a medical microbiologist from Ghent University in Belgium said that a new treatment for IBD would be welcomed. "Conventional drug therapy has limited effectiveness and considerable side effects. Probiotics are live bacterial supplements or food ingredients, which when taken in sufficient numbers confer health benefits to the host," he said. Previous trials of probiotics to treat IBD using mainly lactic acid bacteria have given mixed results. **"Now we realise that lactic acid is used for growth by a certain population of bacteria that produce butyric acid, which could explain why some of the older studies had a positive outcome. Recent trials focussing on butyric acid-producing bacterial strains have been extremely promising and could lead to a new treatment for IBD."**

Developing an effective probiotic treatment for IBD will not be easy, however. "As butyric acid-producing bacteria are naturally depleted in IBD patients, we will need to identify strains that are able to colonize the gut without being outcompeted. Many bacterial species produce butyric acid and possibly other anti-inflammatory molecules so it's a case of finding which is the most robust under these conditions," said Prof. Van Immerseel.

Ralph's Note - Bring back the Natural Unprocessed Butter Milk.

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Link examined between omega-3 fatty acid levels and biological aging marker in patients with CHD

Link examined between omega-3 fatty acid levels and biological aging marker in patients with CHD
Patients with coronary heart disease who had higher omega-3 fatty acid blood levels had an associated lower rate of shortening of telomere length, a chromosome marker of biological aging, raising the possibility that these fatty acids may protect against cellular aging, according to a study in the January 20 issue of JAMA.

Several studies have shown increased survival rates among individuals with high dietary intake of marine omega-3 fatty acids and established cardiovascular disease. The mechanisms underlying this protective effect are not well understood, according to background information in the article.

Telomeres are a structure at the end of a chromosome involved in the replication and stability of the chromosome. Genetic factors and environmental stressors can shorten the length of the telomere, with telomere length becoming an emerging marker of biological age.

Ramin Farzaneh-Far, M.D., of the University of California, San Francisco, and colleagues conducted a study to determine whether omega-3 fatty acid blood levels were associated with changes in leukocyte (a

type of blood cell) telomere length in a study of 608 outpatients with stable coronary artery disease. The patients were recruited between September 2000 and December 2002 for the Heart and Soul Study, and followed up to January 2009 (median [midpoint], 6.0 years). The researchers measured leukocyte telomere length at the beginning of the study and again after 5 years of follow-up. Multivariable models were used to examine the association of baseline levels of omega-3 fatty acids (docosahexaenoic acid [DHA] and eicosapentaenoic acid [EPA]) with subsequent change in telomere length.

The researchers found that individuals in the lowest quartile of DHA+EPA experienced the most rapid rate of telomere shortening, whereas those in the highest quartile experienced the slowest rate of telomere shortening. "Levels of DHA+EPA were associated with less telomere shortening before and after sequential adjustment for established risk factors and potential confounders. Each 1-standard deviation increase in DHA+EPA levels was associated with a 32 percent reduction in the odds of telomere shortening," the authors write.

"In summary, among patients with stable coronary artery disease, there was an inverse relationship between baseline blood levels of marine omega-3 fatty acids and the rate of telomere shortening over 5 years."

"These findings raise the possibility that omega-3 fatty acids may protect against cellular aging in patients with coronary heart disease," the researchers write.

Public release date: 20-Jan-2010

Counterfeit Internet drugs pose significant risks and discourage vital health checks

Men who buy fake internet drugs for erection problems can face significant risks from potentially hazardous contents and bypassing healthcare systems could leave associated problems like diabetes and high blood pressure undiagnosed. That's the warning just published online by IJCP, the International Journal of Clinical Practice.

Medical and pharmaceutical experts from the UK, Sweden and USA carried out a detailed review of the growing problem of counterfeit drugs. Estimates suggest that up to 90 per cent of these illegal preparations are now sold on the internet.

The review, which covers more than fifty studies published between 1995 and 2009, provides a valuable overview of the scale of counterfeit internet drugs, with a specific focus on erectile dysfunction (ED) drugs.

These have played a key role in driving the growth of counterfeit drugs, with studies suggesting that as many as 2.3 million ED drugs are sold a month, mostly without prescription, **and that 44 per cent of the Viagra offered on the internet is counterfeit.**

"The presence of unknown pharmaceutically active ingredients and/or impurities may lead to undesirable and serious adverse events, even death" warns lead author and journal editor Graham Jackson, a London-based cardiologist.

"We discovered that 150 patients had been admitted to hospitals in Singapore after taking counterfeit tadalafil and herbal preparations that claimed to cure ED. Seven were comatose, as the drugs contained a powerful drug used to treat diabetes, and four subsequently died."

But it's not just erectile dysfunction drugs that pose a risk, as Dr Jackson points out: "In Argentina, two pregnant women died after being given injections of a counterfeit iron preparation for anaemia and 51 children died in Bangladesh of kidney failure after taking paracetamol syrup contaminated with diethylene glycol, which is widely used as car antifreeze."

Other examples include fake contraceptive and antimalaria pills, counterfeit antibiotics and a vaccine for life-threatening meningitis that only contained water.

The US-based Center for Medicine in the Public Interest estimates that the global sale of counterfeit drugs will reach \$75 billion in 2010, a 92 per cent increase in five years.

Counterfeit seizures in the European Union (EU) quadrupled between 2005 and 2007 and the number of drug fraud investigations carried out by the US Food and Drug Administration rose 800 per cent between 2000 and 2006.

ED drugs are the most commonly counterfeited product seized in the EU due to their high cost and the embarrassment associated with the underlying condition. Some estimates suggest that as many as 2.5 million men in the EU are using counterfeit Viagra.

Analysis of counterfeit ED drugs has shown that some contain active ingredients, while others contain potentially hazardous contaminants.

Pfizer, which manufactures Viagra, analysed 2,383 suspected counterfeit samples forwarded to the company by law enforcement agencies between 2005 and 2009. It found that a Hungarian sample contained amphetamine, a UK sample contained caffeine and bulk lactose and that printer ink had been used to colour some samples blue. Other samples contained metronidazole, which can have significant adverse effects when combined with alcohol."

And a study of 370 seized "Viagra" samples carried out by the Dutch National Institute for Public Health found that only 10 were genuine, with a range of other drugs present in the samples.

"As well as the risk posed by unknown ingredients, internet drugs circumvent traditional healthcare and this poses its own risks as underlying health conditions could go undiagnosed if people don't seek medical advice" says Dr Jackson.

The World Health Organization states that counterfeit medicines are a threat to communities and must be stopped and there is a general consensus that steps need to be taken to tackle the problem.

"However, obstacles to effective action include the lack of a clear worldwide consensus on what constitutes a counterfeit drug and the fact that activities that are illegal in one country may be legal in another" says Dr Jackson.

"In some cases producing counterfeit medicine can be ten times as profitable per kilogram as heroin, yet in the UK someone can face greater legal sanctions if they produce a counterfeit T-shirt.

"What is clear is that we need much greater public awareness of the risks of buying counterfeit drugs, as lives are at risk.

"It is essential that healthcare clinicians get that message across."

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Retail meat linked to urinary tract infections: Strong new evidence

McGill researcher discovers strong evidence of link between eating contaminated chicken and the E. coli that cause urinary tract infection

Chicken sold in supermarkets, restaurants and other outlets may place young women at risk of urinary tract infections (UTI), McGill researcher Ameer Mangani has discovered.

Samples taken in the Montreal area between 2005 and 2007, in collaboration with the Public Health Agency of Canada and the University of Guelph, provide strong new evidence that E. coli (Escherichia coli) bacteria originating from these food sources can cause common urinary tract infections.

Eating contaminated meat or food does not directly lead to a UTI. While some E. coli such as O157:H7 can cause serious intestinal disease, these E. coli bacteria can live in the intestine without causing problems. In women however, the bacteria can travel from the anus to the vagina and urethra during sex, which can lead to the infection.

The research team is also investigating whether livestock may be passing antimicrobial-resistant bacteria on to humans. This is due to the use of antibiotics to treat or prevent disease in the animals and to enhance their growth, which may lead them to develop resistance to the medication. When animals are slaughtered and their meat is processed for sale, the meat can be contaminated with these bacteria.

“These studies might open the door to discussions with policymakers,” Manges said, “about how antibiotics are used in agriculture in Canada. It’s certainly something we need to continue studying”.

The public should not be alarmed. Manges advises that consumers should cook meat thoroughly and prevent contamination of other foods in the kitchen. Although some infections caused by these E. coli are resistant to some antibiotics, the infections can still be treated. Manges hopes that understanding how these bacteria are transmitted will help reduce infections. She also hopes more attention will be focused on how meat is produced in Canada. Her research is part of a broader study concerning food safety and is financed through funding by the Government of Canada, Public Health Agency of Canada, in collaboration with the Laboratory for Foodborne Zoonoses, specifically the Canadian Integrated Program for Antimicrobial Resistance Surveillance, and also the Division de l’inspection des aliments, Ville de Montréal.

Public release date: 21-Jan-2010

Stain repellent chemical linked to thyroid disease in adults

A study by the University of Exeter and the Peninsula Medical School for the first time links thyroid disease with human exposure to **perfluorooctanoic acid (PFOA)**. **PFOA is a persistent organic chemical used in industrial and consumer goods including nonstick cookware and stain- and water-resistant coatings for carpets and fabrics.**

Published in the journal Environmental Health Perspectives, The study revealed that people with higher concentrations of PFOA in their blood have higher rates of thyroid disease. The researchers analysed samples from the US Centers for Disease Control and Prevention's nationally representative National Health and Nutrition Examination Survey (NHANES).

Tamara Galloway, a professor Ecotoxicology at the University of Exeter and the study's senior author, says: "Our results highlight a real need for further research into the human health effects of low-level exposures to environmental chemicals like PFOA that are ubiquitous in the environment and in people's homes. We need to know what they are doing."

"There have long been suspicions that PFOA concentrations might be linked to changes in thyroid hormone levels," adds study author, David Melzer, a professor of Epidemiology and Public Health at the Peninsula Medical School. "Our analysis shows that in the 'ordinary' adult population there is a solid statistical link between higher concentrations of PFOA in blood and thyroid disease."

PFOA is a very stable man-made chemical that excels at repelling heat, water, grease, and stains. It is used during the process of making common household and industrial items including nonstick pots and pans, flame-resistant and waterproof clothing, wire coatings, and chemical-resistant tubing. PFOA can also be formed by the break-down of certain other highly fluorinated chemicals used in oil and grease-resistant coatings on fast-food containers and wrappers and in stain-resistant carpets, fabrics, and paints.

The study included 3966 adults aged 20 and older whose blood serum was sampled between 1999 and 2006 for PFOA and other perfluoroalkyl acid (PFAA) compounds, including perfluorooctane sulphonate (PFOS). **The researchers found that the individuals with the highest 25% of PFOA concentrations (above 5.7ng/ml) were more than twice as likely to report current thyroid disease than individuals with the lowest 50% of PFOA concentrations (below 4.0ng/ml).** The most specific analysis included 163 women and 46 men who reported having current thyroid disease and who were taking thyroid medication at the time the blood samples were taken. The models used in the analysis were adjusted for potential confounding factors, such as age, gender, ethnicity, smoking, and body mass index.

Previous animal studies carried out by other scientists have shown that the compounds can affect the function of the mammalian thyroid hormone system. This is essential for maintaining heart rate, regulating body temperature and supporting many other body functions, including metabolism, reproduction, digestion and mental health.

The findings are important because research has shown that PFAAs are found in water, air and soil throughout the world, even in remote polar regions. PFOA and PFOS have also been detected in the blood of people from across the globe, as well as in wildlife including birds, fish, and polar bears.

The main source of human exposure to PFOA and PFOS remains uncertain but is believed to be through diet. However, people may also be exposed through the PFAAs used in consumer goods such as textiles, footwear, furniture, and carpets, which can contaminate indoor air and dust.

Although more research is needed to understand the mechanism by which PFOA and

PFOS may affect human thyroid functioning, it is plausible that the compounds could disrupt binding of thyroid hormones in the blood or alter their metabolism in the liver. However, this new evidence does not rule out the possibility that having thyroid disease changes the way the body handles PFOA and/or PFOS. The presence of the compounds might also prove to be simply a marker for some other factor associated with thyroid disease.

Thyroid diseases, particularly hypothyroidism, are much more common in women than men. However, in terms of the link between PFOA and thyroid disease, the researchers found no evidence of a statistically different effect between the sexes. The researchers also found a link between thyroid disease and higher concentrations of PFOS in men, but not in women.

Although previous studies of people living in communities near where PFOA and PFOS are manufactured did not find an association between exposure to these chemicals and thyroid hormone functioning, the largest study of such exposed communities is currently underway. (The 'C8' study of communities near DuPont's Washington Works plant, including Marietta, OH, and Parkersburg, WV, both in the US).

Public release date: 21-Jan-2010

High vitamin D levels linked to lower risk of colon cancer

Research: Association between pre-diagnostic circulating vitamin D concentration and risk of colorectal cancer in European populations: A nested case-control study
High blood levels of vitamin D are associated with a lower risk of colon cancer, finds a large European study published on bmj.com today. **The risk was cut by as much as 40% in people with the highest levels compared with those in the lowest.**

Several previous studies have already suggested a link between vitamin D and colorectal cancer, but the evidence has been inconclusive with limited information from European populations.

So, researchers from across Europe set out to examine the association between circulating vitamin D concentration as well as dietary intakes of vitamin D and calcium with colorectal cancer risk in Western European populations. Colorectal cancer is the combination of colon and rectal cancer cases.

Their findings are based on the European Prospective Investigation into Cancer Study (EPIC), a study of over 520,000 subjects from 10 Western European countries.

Between 1992 and 1998, participants completed detailed dietary and lifestyle questionnaires and blood samples were collected. The subjects were then tracked for several years, during which time 1,248 cases of colorectal cancer were diagnosed and these were matched to 1,248 healthy controls.

Participants with the highest levels of blood vitamin D concentration had a nearly 40% decrease in colorectal cancer risk when compared to those with the lowest levels.

However, some recent publications have suggested maintenance of blood vitamin D levels at 50 nmol/l or higher for colorectal cancer prevention. Thus, the authors also compared low and high levels of blood vitamin D concentration to a mid-level of 50-75 nmol/l. This comparison showed that while levels below the mid-level were associated with increased risk, those above 75 nmol/l were not associated with any additional reduction in colon cancer risk compared to the mid-level.

Although the results support a role for vitamin D in the etiology of colorectal cancer, the authors caution that very little is known about the association of vitamin D with other cancers and that the long term health effects of very high circulating vitamin D concentrations, potentially obtained by taking supplements and/or widespread fortification of some food products, have not been well studied.

With respect to colorectal cancer protection, it is still unclear whether inducing higher blood vitamin D concentration by supplementation is better than average levels that can be achieved with a balanced diet combined with regular and moderate exposure to outdoor sunlight, they say.

The findings of previous randomised trials have been inconsistent. As such, new trials should be carried out to evaluate whether increases in circulating vitamin D concentration can effectively reduce colorectal cancer risk without inducing serious adverse events, they conclude. Currently, the best recommendation to reduce ones risk of colorectal cancer is to stop smoking, increase physical activity, reduce obesity and abdominal fatness, and limit intakes of alcohol and red and processed meats.

Public release date: 21-Jan-2010

New study: Human running speeds of 35 to 40 mph may be biologically possible

New evidence identifies critical variable imposing biological limit to running speed
Jamaican sprinter Usain Bolt's record-setting performances have unleashed a wave of interest in the ultimate limits to human running speed. A new study published in the Journal of Applied Physiology offers intriguing insights into the biology and perhaps even the future of human running speed.

The newly published evidence identifies the critical variable imposing the biological limit to running speed, and offers an enticing view of how the biological limits might be pushed back beyond the nearly 28 miles per hour speeds achieved by Bolt to speeds of perhaps 35 or even 40 miles per hour.

The new paper, "The biological limits to running speed are imposed from the ground up,"

was authored by Peter Weyand of Southern Methodist University; Rosalind Sandell and Danille Prime, both formerly of Rice University; and Matthew Bundle of the University of Wyoming.

"The prevailing view that speed is limited by the force with which the limbs can strike the running surface is an eminently reasonable one," said Weyand, associate professor of applied physiology and biomechanics at SMU in Dallas.

"If one considers that elite sprinters can apply peak forces of 800 to 1,000 pounds with a single limb during each sprinting step, it's easy to believe that runners are probably operating at or near the force limits of their muscles and limbs," he said. "However, our new data clearly show that this is not the case. Despite how large the running forces can be, we found that the limbs are capable of applying much greater ground forces than those present during top-speed forward running."

In contrast to a force limit, what the researchers found was that the critical biological limit is imposed by time — specifically, the very brief periods of time available to apply force to the ground while sprinting. In elite sprinters, foot-ground contact times are less than one-tenth of one second, and peak ground forces occur within less than one-twentieth of one second of the first instant of foot-ground contact.

The researchers took advantage of several experimental tools to arrive at the new conclusions. They used a high-speed treadmill capable of attaining speeds greater than 40 miles per hour and of acquiring precise measurements of the forces applied to the surface with each footfall. They also had subjects perform at high speeds in different gaits. In addition to completing traditional top-speed forward running tests, subjects hopped on one leg and ran backward to their fastest possible speeds on the treadmill.

The unconventional tests were strategically selected to test the prevailing beliefs about mechanical factors that limit human running speeds — specifically, the idea that the speed limit is imposed by how forcefully a runner's limbs can strike the ground.

However, the researchers found that the ground forces applied while hopping on one leg at top speed exceeded those applied during top-speed forward running by 30 percent or more, and that the forces generated by the active muscles within the limb were roughly 1.5 to 2 times greater in the one-legged hopping gait.

The time limit conclusion was supported by the agreement of the minimum foot-ground contact times observed during top-speed backward and forward running. Although top backward vs. forward speeds were substantially slower, as expected, the minimum periods of foot-ground contact at top backward and forward speeds were essentially identical.

According to Matthew Bundle, an assistant professor of biomechanics at the University of Wyoming, "The very close agreement in the briefest periods of foot-ground contact at top speed in these two very different gaits points to a biological limit on how quickly the

active muscle fibers can generate the forces necessary to get the runner back up off the ground during each step."

The researchers said the new work shows that running speed limits are set by the contractile speed limits of the muscle fibers themselves, with fiber contractile speeds setting the limit on how quickly the runner's limb can apply force to the running surface.

"Our simple projections indicate that muscle contractile speeds that would allow for maximal or near-maximal forces would permit running speeds of 35 to 40 miles per hour and conceivably faster," Bundle said.

Public release date: 25-Jan-2010

Low-carb diet effective at lowering blood pressure

DURHAM, NC — In a head-to-head comparison, two popular weight loss methods proved equally effective at helping participants lose significant amounts of weight. But, in a surprising twist, a low-carbohydrate diet proved better at lowering blood pressure than the weight-loss drug orlistat, according to researchers at Veterans Affairs Medical Center and Duke University Medical Center.

The findings send an important message to hypertensive people trying to lose weight, says William S. Yancy, Jr., MD, lead author of the study in the Jan. 25 Archives of Internal Medicine, and an associate professor of medicine at Duke. "If people have high blood pressure and a weight problem, a low-carbohydrate diet might be a better option than a weight loss medication."

Yancy added, "It's important to know you can try a diet instead of medication and get the same weight loss results with fewer costs and potentially fewer side effects."

Studies had already indicated that a low-carbohydrate diet and prescription-strength orlistat combined with a low-fat diet are effective weight loss therapies. But the two common strategies had not been compared to each other, an important omission now that orlistat is available over-the-counter. In addition, few studies provide data on these treatments for overweight patients with chronic health issues.

That's what made these findings particularly interesting, says Yancy, a staff physician at the Durham VA where the research was conducted. The 146 overweight participants in the year-long study had a range of health problems typically associated with obesity -- diabetes, high blood pressure, high cholesterol and arthritis.

"Most participants in weight loss studies are healthy and don't have these problems," he said. "In fact they are often excluded if they do."

The average weight loss for both groups was nearly 10 percent of their body weight. "Not many studies are able to achieve that," says Yancy, who attributes the significant weight

loss to the group counseling that was offered for 48 weeks. In fact, he says "people tolerated orlistat better than I expected. Orlistat use is often limited by gastro-intestinal side effects, but these can be avoided, or at least lessened, by following a low-fat diet closely. We counseled people on orlistat in our study fairly extensively about the low-fat diet."

In addition to achieving equal success at weight loss, the methods proved equally effective at improving cholesterol and glucose levels.

But Yancy said it was the difference in blood pressure results that was most surprising.

Nearly half (47%) of patients in the low-carbohydrate group had their blood pressure medication decreased or discontinued while only 21 percent of the orlistat plus low-fat diet group experienced a reduction in medication use. Systolic blood pressure dropped considerably in the low-carbohydrate group when compared to the orlistat plus low-fat diet group.

"I expected the weight loss to be considerable with both therapies but we were surprised to see blood pressure improve so much more with the low-carbohydrate diet than with orlistat," says Yancy, who says the mechanism is unclear. "While weight loss typically induces improvements in blood pressure, it may be that the low-carbohydrate diet has an additional effect." That physiologic effect may be the subject of future studies.

The bottom line, says Yancy, is that many diet options are proving effective at weight loss. But it's counseling patients on how to best follow the options that appears to be making the biggest impact. "It is clear now that several diet options can work, so people can be given a choice of different ways to lose weight. But more importantly, we need to find new ways to help people maintain their new lifestyle."

Public release date: 26-Jan-2010

Study links reduced fertility to flame retardant exposure

Berkeley – Women with higher blood levels of PBDEs, a type of flame retardant commonly found in household consumer products, took longer to become pregnant compared with women who have lower PBDE levels, according to a new study by researchers at the University of California, Berkeley.

The study, to be published Jan. 26 in the journal *Environmental Health Perspectives*, **found that each 10-fold increase in the blood concentration of four PBDE chemicals was linked to a 30 percent decrease in the odds of becoming pregnant each month.**

"There have been numerous animal studies that have found a range of health effects from exposure to PBDEs, but very little research has been done in humans. This latest paper is the first to address the impact on human fertility, and the results are surprisingly strong," said the study's lead author, Kim Harley, adjunct assistant professor of maternal and child

health and associate director of the Center for Children's Environmental Health Research at UC Berkeley's School of Public Health. "These findings need to be replicated, but they have important implications for regulators."

PBDEs, or polybrominated diphenyl ethers, are a class of organobromine compounds that became commonplace after the 1970s when new fire safety standards were implemented in the United States. The flame retardants are used in foam furniture, electronics, fabrics, carpets, plastics and other common items in the home.

Studies have found widespread contamination of house dust by PBDEs, which are known to leach out into the environment and accumulate in human fat cells.

Studies also suggest that 97 percent of U.S. residents have detectable levels of PBDEs in their blood, and that the levels in Americans are 20 times higher than in their European counterparts. According to the researchers, ***residents in California are among those experiencing the highest exposures, most likely due to the state's relatively stringent flammability laws.***

The researchers measured PBDE levels in blood samples from 223 pregnant women enrolled in a longitudinal study at the Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS) that examines environmental exposures and reproductive health.

The median concentrations of the four PBDE chemicals in the analysis were slightly lower in this study population than in the general U.S. population, possibly because many of the participants had grown up in Mexico where PBDE exposures are limited, said the authors of the study. The median number of months it took to get pregnant was three, with 15 percent of the participants taking longer than 12 months to conceive.

When the analysis was limited to women who were actively trying to become pregnant, the researchers found that they were half as likely to conceive in any given month if they had high levels of PBDE in their blood. "We aren't looking at infertility, just subfertility, because all the women in our study eventually became pregnant," said Harley. "Had we included infertile couples in our study, it is possible that we would have seen an even stronger effect from PBDE exposure."

It is not entirely clear how PBDEs might impact fertility. A number of animal studies have found that PBDEs can impair neurodevelopment, reduce thyroid hormones, and alter levels of sex hormones. Both high and low thyroid hormone levels can disrupt normal menstrual patterns in humans, but this study did not find a link between PBDE exposure and irregular menstrual cycles.

Because the participants were mostly young, Mexican immigrant women who lived in an agricultural community, the researchers controlled for exposure to pesticides in their analysis. The researchers also controlled for other variables known to impact fertility,

such as irregularity of menstrual cycles, frequency of intercourse, pre-pregnancy body mass index, use of birth control pills in the year before conception, smoking, and alcohol and caffeine consumption.

There are some 209 different possible formulations of PBDEs, but only three mixtures – pentaBDE, octaBDE and decaBDE – have been developed for commercial use as flame retardants. The mixtures are distinguished by the average number of bromine atoms attached to each molecule. Like many other studies, the most prevalent PBDEs in the blood of women participating in the UC Berkeley study were four components of the pentaBDE mixture.

Penta- and octaBDE have both been banned for use in several U.S. states, including California, but they are still present in products made before 2004. Last month, the U.S. Environmental Protection Agency (EPA) announced an agreement with three major manufacturers of decaBDE to phase out its production by 2013.

"Although several types of PBDEs are being phased out in the United States, our exposure to the flame retardants is likely to continue for many years," said the study's principal investigator, Brenda Eskenazi, UC Berkeley professor of epidemiology and of maternal and child health at the School of Public Health. "PBDEs are present in many consumer products, and we know they leach out into our homes. In our research, we have found that low-income children in California are exposed to very high levels of PBDEs, and this has us concerned about the next generation of Californians."

Keeping up with the ever-expanding range of chemicals in our environment is challenging, the researchers noted. As PBDEs are being phased out, they are being replaced with other brominated compounds. "We know even less about the newer flame retardant chemicals that are coming out," said Harley. "We just don't have the human studies yet to show that they are safe."

A 2007 state assembly bill that would have banned all brominated and chlorinated chemical flame retardants from household furniture and bedding sold in California failed to pass.

Public release date: 27-Jan-2010

Magnesium supplement helps boost brainpower

Supplement enhances learning abilities, memory in rats

CAMBRIDGE, Mass.—Neuroscientists at MIT and Tsinghua University in Beijing show that increasing brain magnesium with a new compound enhanced learning abilities, working memory, and short- and long-term memory in rats. The dietary supplement also boosted older rats' ability to perform a variety of learning tests.

Magnesium, an essential element, is found in dark, leafy vegetables such as spinach and in some fruits. Those who get less than 400 milligrams daily are at risk for allergies, asthma and heart disease, among other conditions. In 2004, Guosong Liu and colleagues at MIT discovered that magnesium might have a positive influence on learning and memory. They followed up by developing a new magnesium compound — magnesium-L-threonate (MgT) —that is more effective than conventional oral supplements at boosting magnesium in the brain, and tested it on rats.

"We found that elevation of brain magnesium led to significant enhancement of spatial and associative memory in both young and aged rats," said Liu, now director of the Center for Learning and Memory at Tsinghua University. "If MgT is shown to be safe and effective in humans, these results may have a significant impact on public health." Liu is cofounder of Magceutics, a California-based company developing drugs for prevention and treatment of age-dependent memory decline and Alzheimer's disease.

"Half the population of the industrialized countries has a magnesium deficit, which increases with aging. If normal or even higher levels of magnesium can be maintained, we may be able to significantly slow age-related loss of cognitive function and perhaps prevent or treat diseases that affect cognitive function," Liu said.

HOW THEY DID IT: To understand the molecular mechanisms underlying this MgT-induced memory enhancement, the researchers studied the changes induced in functional and structural properties of synapses. They found that in young and aged rats, MgT increased plasticity among synapses, the connections among neurons, and boosted the density of synapses in the hippocampus, a critical brain region for learning and memory.

Susumu Tonegawa at MIT's Picower Institute for Learning and Memory helped carry out the initial behavioral experiments that showed that magnesium boosted memory in aged rats. Min Zhou's laboratory at the University of Toronto helped demonstrate the enhancement of synaptic plasticity in magnesium-treated rats.

NEXT STEPS: This study not only highlights the importance of a diet with sufficient daily magnesium, but also suggests the usefulness of magnesium-based treatments for aging-associated memory decline, Tonegawa said. Clinical studies in Beijing are now investigating the relationship between body magnesium status and cognitive functions in older humans and Alzheimer's patients.

Public release date: 27-Jan-2010

Pomegranate extract stimulates uterine contractions

The team identified beta-sitosterol – a steroid that can inhibit the absorption of cholesterol in the intestine – as the main constituent of pomegranate seed extract. The research suggests that pomegranate extract could be used as a natural stimulant to encourage the uterus to contract during labour.

Pomegranate juice is thought to have a number of health benefits, from lowering cholesterol and blood pressure to protecting against some cancers, but until now there has been no evidence to demonstrate its effects on the uterus. Researchers investigated pomegranate seed extract – more highly concentrated than pomegranate juice – and its effect on uterine smooth muscle samples.

Professor Sue Wray, from the University's Department of Physiology, said: "Previous study has suggested that the pomegranate's antioxidant and anti-inflammatory properties have a positive impact on health. We wanted to understand its effect on uterine contractions to help us explore new ways of treating women who may experience difficult labours. **Currently the only available drug to treat women with a poorly contracting uterus is oxytocin, a hormone which only works approximately 50% of the time.**

"It is important for us to investigate how the uterus works and what happens when it does not contract normally so that women experiencing problems during labour do not have to undergo major surgery to deliver a healthy baby."

Dr Sajeera Kupittayanant, from Suranaree's Institute of Science, explains: "We found that beta-sitosterol was the main constituent of pomegranate extract, a steroid present in many plant species, but particularly rich in pomegranate seed. We added the extract to uterus tissue samples from animals and found that the muscle cells increased their activity. Our work suggests that the increase is due to a rise in calcium, which is necessary in order for any muscle to contract, but is usually affected by hormones, nerve impulses and some drug treatments.

"The next step is to investigate how beta-sitosterol in pomegranate extract could increase calcium, but it could prove to be a significant step forward in identifying new ways of treating dysfunctional labour."

The research, published in *Reproductive Sciences*, will support work being conducted at a new centre dedicated to improving experiences in pregnancy and childbirth for women across the world. The Centre for Better Births will bring together researchers and clinicians to improve understanding in areas such as premature labour, recurrent miscarriage and prolonged labour.

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Vitamin D supplements could fight Crohn's disease

Canadian research team publishes findings in *Journal of Biological Chemistry*

Montreal, January 27, 2010 – A new study has found that Vitamin D, readily available in supplements or cod liver oil, can counter the effects of Crohn's disease. John White, an endocrinologist at the Research Institute of the McGill University Health Centre, led a team of scientists from McGill University and the Université de Montréal who present their findings about the inflammatory bowel disease in the latest *Journal of Biological Chemistry*.

"Our data suggests, for the first time, that Vitamin D deficiency can contribute to Crohn's disease," says Dr. White, a professor in McGill's Department of Physiology, noting that people from northern countries, which receive less sunlight that is necessary for the fabrication of Vitamin D by the human body, are particularly vulnerable to Crohn's disease.

Vitamin D, in its active form (1,25-dihydroxyvitamin D), is a hormone that binds to receptors in the body's cells. Dr. White's interest in Vitamin D was originally in its effects in mitigating cancer. Because his results kept pointing to Vitamin D's effects on the immune system, specifically the innate immune system that acts as the body's first defense against microbial invaders, he investigated Crohn's disease. "It's a defect in innate immune handling of intestinal bacteria that leads to an inflammatory response that may lead to an autoimmune condition," stresses Dr. White.

What Vitamin D does

Dr. White and his team found that Vitamin D acts directly on the beta defensin 2 gene, which encodes an antimicrobial peptide, and the NOD2 gene that alerts cells to the presence of invading microbes. Both Beta-defensin and NOD2 have been linked to Crohn's disease. If NOD2 is deficient or defective, it cannot combat invaders in the intestinal tract.

What's most promising about this genetic discovery, says Dr. White, is how it can be quickly put to the test. "Siblings of patients with Crohn's disease that haven't yet developed the disease might be well advised to make sure they're vitamin D sufficient. It's something that's easy to do, because they can simply go to a pharmacy and buy Vitamin D supplements. The vast majority of people would be candidates for Vitamin D treatment."

"This discovery is exciting, since it shows how an over-the-counter supplement such as Vitamin D could help people defend themselves against Crohn's disease," says Marc J. Servant, a professor at the Université de Montréal's Faculty of Pharmacy and study collaborator. "We have identified a new treatment avenue for people with Crohn's disease or other inflammatory bowel diseases."

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Common antidepressant drugs linked to lactation difficulties in moms

According to a new study accepted for publication in The Endocrine Society's Journal of Clinical Endocrinology & Metabolism (JCEM), women taking commonly used forms of antidepressant drugs may experience delayed lactation after giving birth and may need additional support to achieve their breastfeeding goals.

Breastfeeding benefits both infants and mothers in many ways as breast milk is easy to digest and contains antibodies that can protect infants from bacterial and viral infections. The World Health Organization recommends that infants should be exclusively breastfed for the first six months of life. This new study shows that certain common antidepressant drugs may be linked to a common difficulty experienced by new mothers known as delayed secretory activation, defined as a delay in the initiation of full milk secretion.

"The breasts are serotonin-regulated glands, meaning the breasts' ability to secrete milk at the right time is closely related to the body's production and regulation of the hormone serotonin," said Nelson Horseman, PhD, of the University of Cincinnati and co-author of the study. "Common antidepressant drugs like fluoxetine, sertraline and

paroxetine are known as selective serotonin reuptake inhibitor (SSRI) drugs and while they can affect mood, emotion and sleep they may also impact serotonin regulation in the breast, placing new mothers at greater risk of a delay in the establishment of a full milk supply."

In this study, researchers examined the effects of SSRI drugs on lactation using laboratory studies of human and animal cell lines and genetically modified mice. Furthermore, an observational study evaluated the impact of SSRI drugs on the onset of milk production in postpartum women. In this study of 431 postpartum women, median onset of lactation was 85.8 hours postpartum for the SSRI-treated mothers and 69.1 hours for mothers not treated with SSRI drugs. Researchers commonly define delayed secretory activation as occurring later than 72 hours postpartum.

"SSRI drugs are very helpful medications for many moms, so understanding and ameliorating difficulties moms experience can help them achieve their goals for breastfeeding their babies," said Horseman. "More human research is needed before we can make specific recommendations regarding SSRI use during breastfeeding."

**These reports are done with the appreciation of all the Doctors, Scientist, and other Medical Researchers who sacrificed their time and effort. In order to give people the ability to empower themselves. Without the base aspirations for fame, or fortune.
Just honorable people, doing honorable things.**