

## **Betsy says HI!!!!**

### **Announcements**

**The next LABQUEST meeting will be this Wednesday, October 8 at 12:30 in the GSA Trailer.**

### **Science Report Highlights**

Betsy and Dan thought all the items in following science report from Charles were interesting but most liked the following:

- Covid Isn't Over
- New Measles Outbreak
- Cancer In Iowa
- PFAS Toxicity
- Reusable Water Bottles
- Reclaiming Scarce Materials From Spent EV Batteries
- World Record For Holding Breath

### **Science Report**

#### **Self-Protective Measures -**

You should get your medical advice from official sources, your doctor, or your pharmacist ... not from this Report or the internet. Per FDA vaccine approvals, with the last word being from your doctor, everyone should maintain current vaccinations for the three respiratory viruses: Covid, flu and RSV (for RSV, adults [over 60](#) and children <8 months subject to pediatrician recommendation) - unless your doctor advises against it. Adults over 50 should have had the [Shingrix vaccine for shingles](#) (two doses 2 to 6 months apart, good indefinitely). Adults over 50 should have the [Pneumococcal Vaccine](#). Many states, by legislation and regulation, are making access to these vaccines less complex - [map](#).

- [Covid Isn't Over](#) - The new strain, nicknamed 'Stratus', is slightly more infectious than earlier strains, and results in about the same severity of illness. The new vaccine formulation is expected to be effective in reducing severity and risk of hospitalization, but as before, will not necessarily *prevent* infection. See the list of symptoms, and a list of states where Stratus is currently (8/26) surging, [here](#).
- [New Measles Outbreak](#) - Southwestern Utah, and bordering Arizona (near ColoradoCity), have reported (9/28) a new outbreak, most cases being unvaccinated school age children, [details](#). Measles vaccination rates in the area are about 79%. A 95% rate is needed.
- [Flood Mapping Tool](#) - The US National Oceanic and Atmospheric Administration (NOAA) National Weather Service has announced an expanded version of their Flood Information Mapping tool (FIM), now covering 60% of the US. The FIM can create a simulation of flooding, presented in an image. See a map of the expanded coverage, and an FIM simulation of flooding projected for the Tug Fork River in the area of Warfield Kentucky, [here](#). The FIM tool is available to the public on the National Water Prediction website, [here](#).
- [The Importance Of Choosing Low Fat Dairy](#) - and generally minimizing saturated fat. See recommendations from the Physicians' Committee For Responsible Medicine, [here](#). Summary: [bone health](#), skin health, prostate issues, [heart disease](#), Type 2 diabetes, Alzheimer's Disease, cancer.

- X-Ray Shielding - The walls of x-ray exposure areas must be lead shielded. They didn't do that at this Utah hospital when they installed a new imaging center in a former office across the adjoining wall from an existing diabetes clinic. See the sad result, [here](#).
- NIH BMI Calculator - Use the [NIH](#) National Heart, Lung and Blood Institute [calculator](#) to find your Body Mass Index (BMI). Above 25 - overweight. Above 30, check with your doctor, consider better nutrition, and exercise.
- Basal Metabolic Rate (BMR) - Your BMR is how many calories you burn just sitting in your chair. Use the [calculator](#) to get your BMR. Then consult the exercise table to see how many calories you can consume daily with your current exercise plan and still maintain your current weight.
- Body Roundness Index (BRI) - is a new medical screening tool for estimating *visceral* fat, [details](#). Use a calculator to get your BRI [here](#). Additional background from Harvard, [here](#). Results to your doc.

### Vaccine and Therapeutic News -

- Glioblastoma Multiforme - [AstraZeneca](#) (Cambridge UK) is sponsoring a [Phase 1 multicenter study](#) to assess the safety and pharmacokinetics of ascending doses of its ATM inhibitor ([radiosensitizer](#)) medication AZD1390, in combination with radiation therapy, in patients with glioblastoma multiforme and brain metastases from solid tumors. The key breakthrough is the ability of the medication to penetrate the blood/brain barrier to reach cancer cells located in the brain. Once there, it inhibits repair of the double-strand DNA breaks characteristic of radiation exposure, making standard-of-care radiotherapy more effective. Early preliminary results of the Phase 1 clinical trial were released last year on 4/9/24, [here](#). Hopeful.
- Colorectal Cancer - A clinical trial done by the Swedish researchers at the Karolinska Institutet and Karolinska University Hospital showed that aspirin reduced ([by 55%](#)) the postoperative recurrence of colorectal cancers with the the PIK3CA mutation (40% of the total). [Publication](#). [Background](#).
- Breast Cancer - [Eli Lilly](#) (Indianapolis IN) has [announced](#) FDA approval of its orally administered medication [Inluriyo](#) (imlunestran) for the treatment of estrogen receptor-positive, human epidermal growth factor receptor 2-negative, ESR1-mutated advanced or metastatic breast cancer.
- Pancreatic Cancer - [Oncolytics Biotech](#) (Calgary, Alberta Canada) will be meeting with FDA in November to propose a three-arm human trial for its medication 'Pelareorep' for this indication. Pelareorep also has promise for [other types of cancer](#). Promising
- Preparing For A Colonoscopy - Not a walk in the park, but there are 5 things that doctors and nurses say may make it easier, [here](#).
- Hepatitis B Vaccine - See why the World Health Organization (WHO) recommends vaccination for this virus *at birth*, [here](#).
- Autism, Acetaminophen (Tylenol) And Treatment With Leucovorin (Folinic Acid) - See a statement from The Autism Research Institute (ARI) on these topics, edited by ARI's Chief Science Officer, [here](#). According to the ARI, Autism Spectrum Disorder (Autism) consists of several subtypes with no single cause and no single treatment benefiting everyone. Leucovorin may help some patients.

### Other Health Science News -

- First mRNA Vaccine Manufacturing Facility In UK - was [opened](#) by [Moderna](#) (Cambridge MA) this month at the Moderna Innovation and Technology Centre, its new vaccine manufacturing and research and development facility in Oxfordshire, UK - on the Harwell Science and Innovation Campus. Promise of more R&D progress, as well as improvements in vaccine manufacturing tech.
- FDA Advice On Being Prepared For An MRI Exam - [here](#).
- Progress On Correcting Hair Loss - UCLA researchers have identified a molecule, PP405, that they say can reawaken hair follicles by inhibiting the protein that is keeping the cells dormant, [details](#). Early human trials in 2023 were promising. Now a company, [Pelage Pharmaceuticals](#) (Los Angeles CA), has been formed to pursue the matter with FDA in [further trials](#). Hair loss affects more than 80% of men and 40% of women over their lifetimes. [Publication](#)
- Human Eggs Created In Lab - using adult skin cells. The newly created eggs then carry the genes of the skin cell donor. The field is called *vitro gametogenesis*. [Details](#) and a [publication](#). Consider the possibilities ... and implications. It's going to be complicated.
- Cancer In Iowa - occurs at the second highest rate in the US, and Iowa is one of only 2 states in the US where *cancer rates are increasing*. Pesticides and nitrates have been shown to cause cancer. A recently completed [report](#) shows that two Iowa rivers providing drinking water for 600,000 Iowans are contaminated with animal waste, chemicals related to agriculture, and [nitrates](#) well in excess of safe levels. The report also makes recommendations for action that isn't happening [Details](#). Can you connect the dots?
- PFAS Toxicity - In addition to general toxicity, PFAS is now known to cause changes in gene activity. [New research](#) has specifically linked PFAS to a spectrum of health disorders: multiple cancers, neurological disorders and autoimmune diseases. [Details](#)
- Agricultural Pesticide Chlorpyrifos - Newly [published](#) research has established a clear connection between the exposure (including prenatal exposure) of children to this pesticide, and widespread molecular, cellular, and metabolic effects in their brains. Agricultural interests have [prevented EPA from placing a ban on Chlorpyrifos](#), but you can decide to **buy organic**. States could also act.
- Valley Fever - This deadly fungus has been spreading out from its original desert and valley range in the Southwest, and is now turning up in AZ, CA, NV, UT, TX, NM, CO and at the intersection of WA, OR and ID. Details, symptoms, and a map [here](#). Its spores are spread by dust and wind, with the peak disease season being Fall and Winter. Pets can get the disease [John McK.]
- FDA Finds More Lead In Ground Cinnamon - [Update](#).
- What Does This 58 Year Old Doctor Eat - and not eat, to achieve her goal of leading a long and healthy life. [Details](#), but no sugar. Tune-up: low fat dairy, fermented dairy, fatty fish, eggs thoroughly cooked (boiled, not fried).
- Osteoarthritis (OA) - The three main causes are 1) Overused/overstressed joints, 2) Inflammation, 3) Genetics. Details, including who is most at risk, [here](#).
- Cat Osteoarthritis (OA) - The [Zoetis](#) (Parsippany NJ) monoclonal antibody medication for this indication, [Portela \(relfovetmab\)](#), is nearing approval in the EU ... expected this year. When approved, it will be the first long-acting anti-NGF mAb therapy available for cats - up to three months of OA pain relief with a single injection. [Devin S]
- Reusable Water Bottles - must be washed routinely. In a study of students' [water bottles at Purdue University](#), 60% were found to have unacceptable levels of colonizing bacteria, and 1 in 3 had excessive levels of fecal coliform bacteria. [Publication](#).
- 2 Medical Devices Everyone Should Have At Home - digital thermometer, fingertip pulse oximeter. Routinely measuring three biomarkers ... temperature, pulse rate and blood oxygen level ... will give you a quick, easy, painless, non-invasive [early alert when something is](#)

[up](#). According to the [Mayo Clinic](#), the blood oxygen level range for a healthy adult is 95-100%. [CC]

- [Are Your Stools Healthy?](#) - Check the Bristol Stool Chart, [here](#). Ideally you should be a Type 3 or 4. This simple check, that you can routinely do yourself in a few seconds, may help catch a problem early, and could provide important information for your doctor. [Details](#).

## Practical Nutrition -

- [Is Honey Or Maple Syrup Healthier?](#) - Both are 'added sugar', best used in moderation. They also offer vitamins, antioxidants and minerals that refined sugar doesn't. Which you choose depends on your nutritional goals. Get nutritional run-downs on each from a registered dietitian, [here](#). Summary ... Honey for antioxidants and immune support ... Maple syrup if insulin response and a lower glycemic index are the priorities.
- [Avocado Scanners](#) - test the ripeness of avocados using an infrared beam. They are [already in grocery stores in the EU](#), and are being tested in the UK. Mashing avocados to test ripeness is so yesterday.
- [Aronia Berries](#) - are native to North America, and are available frozen or dried at the right grocery stores. They have excellent antioxidants/vitamins/minerals, and make a good addition to smoothies. Details, benefits, and a nutritional run-down [here](#). [CC]
- [Two Anti-inflammatory Foods](#) - often recommended by nutritionists: spinach and pomegranates. [Details](#), and tasty recipes. Most nutritious when eaten raw
- [Greek Yogurt Or Cottage Cheese](#) - both are healthy, and provide good protein. See the nutritional rundowns by a registered dietitian [here](#). Summary: Yogurt has twice the calories of cottage cheese. Cottage cheese has 5 times the Sodium of Greek yogurt (has the edge). Tune-up: Choose unflavored versions of each, and add your own fresh fruit or berries ... *maybe* even a small dash of honey.
- [7 Ways To Bake A Potato](#) - were tested in this kitchen experiment, and the simplest way turned out to produce the best result, [here](#). Tune-up: For the initial oil coating, use avocado oil. Baking at 425° F exceeds the smoke temperature of the olive oil used in the test
- [Almonds](#) - have been found to lower LDL cholesterol, [here](#). And ... there's a video on what to eat for breakfast.
- [Artificial Sweeteners Connected To Declines In Memory And Thinking Skills](#) - especially for those with diabetes or [younger than 60](#). The [12,700 person study](#) covered 7 sweeteners: aspartame, saccharin, acesulfame-K, erythritol, xylitol, sorbitol and tagatose. All but tagatose correlated with cognitive decline. [Publication](#)
- [Misleading Words For Sugar](#) - High-fructose corn syrup, sucrose, barley malt, dextrose, maltose and rice syrup are all [forms of sugar](#). Certain blood alcohols sometimes used as sweeteners, such as Erythritol and Xylitol, are made by the body and occur naturally in certain foods - but in very small amounts. They have recently been [linked to heart disease and stroke by Cleveland Clinic researchers](#), and should be avoided as food additives. Chemical sugar substitutes to be avoided: acesulfame potassium, advantame, allulose, aspartame, brazzein, lactitol, maltitol, mannitol, neotame, rebaudioside A (reb-A), saccharin, sorbitol, thaumatin and trehalose.
- [Is Your Favorite Food Ultra-Processed?](#) - and if so, what's a good substitute. View the Northeastern University [TrueFood Dashboard](#).
- [Most Nutritious Vegetables and Fruits Rank-Ordered by CDC](#) - See the list [here](#). Chinese cabbage = bok choy.

## Environmental Science News -

- EV Batteries, Grid-Scale Storage And More -
  - Reclaiming Scarce Materials From Spent EV Batteries - Two European companies, [Syensqo](#) (Brussels Belgium) and [Cylib](#) (Aachen Germany) have [announced](#) a partnership to extract high-purity lithium hydroxide and other scarce materials from the shredded electrodes (black mass) of used EV batteries - including batteries using various battery chemistries, *on a single line*. Elegant chemical engineering, and a step forward for the circular economy. [Background](#).
  - Massive EV Project In Ho Chi Minh City Vietnam - The city plans to transition 400,000 cars to EVs by 2028, and has proposed a facility that would reclaim up to 95% of the metal in their used batteries for reuse in new batteries. [Details](#).
  - Electrolyzers And Batteries Reduce Nextgen Energy Costs - Researchers at Leibniz University (Germany) lay out the details, [here](#). We have the tech. Do we have the courage to take the necessary steps?
  - 1 Million Homes Powered From A Single Battery - BlackRock's [Akaysha Energy](#) (Victoria Australia) is building the Waratah Super Battery in Australia. When complete it will be the [world's largest](#) in terms of energy storage - 850 MW, 1,680 MWh, power for 1 million homes for 1 hour. Australia is moving to [shut down coal-fired power plants by 2035](#).
  - The World's Largest Wind (500 MW), Solar (5MW), Hydrogen Storage, Electrolysis (240 MW), And Green Ammonia Plant - running as a [single closed-loop energy system](#), will also include the world's first [large-scale turbine \(30 MW\) designed to run entirely on hydrogen](#). The plant is located in the Otok High-Tech Industrial Development Zone, Inner Mongolia, northern China. The future is now.
  - Solid-State Battery Technology - [Microvast Holdings](#) (Stafford TX) is making progress in developing this technology ... faster charging, safer, longer life-span, smaller and lighter than conventional lithium-ion tech. The company expects to complete the 2 GWh expansion of its existing factory in Huzhou, China by the end of this year. [Details](#). Promising, doesn't go boom.
  - EV Battery Engineering Holy Grail - [SK On](#) (Seoul S. Korea) has opened the first pilot plant for *all*-solid-state EV batteries ahead of the company's original schedule, with plans to manufacture them at scale in 2029. Greater EV range, faster charging, safer. [Details](#)
  - Battery Powered, Autonomous Warehouse Robots - [Symbotic](#) (Wilmington MA) has a line of AI-guided robots that greatly improve the efficiency of warehouse operations. Their video explains it well, [here](#). The company is currently [transitioning](#) from powering its robots from ultracapacitors, to [high-energy-density battery systems](#) from [Nyobolt](#) (Cambridge UK). [Six times the energy capacity, 40% lighter](#).
  - iPhone Battery Life - See a bar chart comparing battery life for various iPhones, [here](#). The batteries have gotten better, and the phones have become more energy efficient.
- Revolution Wind - Construction on Orsted's large wind farm offshore from Connecticut and Rhode Island, now 80% complete, will be [allowed to continue](#) now that a federal court has lifted the 8/22 stop work order from the US Bureau of Ocean Energy Management.
- World's Largest Bug Farm - The French company [Innovafeed](#) (Paris France) has a facility that uses 10 billion black soldier fly larvae to recycle food into animal feed, oil, and fertilizer as an alternative to conventional animal feed like fishmeal and soy ... which contribute to ocean overfishing and deforestation. The company is now teaming up with [ADM](#) (Chicago IL) and

[Cargill](#) (Washington DC) to expand operations into the US, with a major facility planned for Decatur, Illinois. [Details](#)

- [Bright Orange Nurse Shark With White Eyes](#) - A six foot shark was recently spotted near Costa Rica's Tortuguero National Park with a coloring not seen before in the Caribbean. [Video](#).
- [The Chicago River](#) - was once so polluted it sometimes caught fire. Now fish have come back, a [giant snapping turtle](#) called '[Chonkosaurus](#)' (Chonk) has taken up residence, kayakers are giving tours, and the city is planning the first open water swim in a century. Environmentalists credit federal regulations, the city's efforts to clean-up its combined sewer overflow issues, and a floating wetland project called [The Wild Mile](#), sponsored by Urban Rivers (video [here](#)). What's on the bottom now, video [here](#). Well done! [Bill McC.]
- [The Anacostia River](#) - For more than a century Washington Gas operated the East Station plant at the edge of the river near the present baseball stadium. Toxic chemicals, such as polynuclear aromatic hydrocarbons, volatile organic compounds, benzene and heavy metals, leaked from the site into the water, and became embedded in sediment near the foot of the 11th Street Bridge. The company and the DC Attorney General have now reached a clean-up [settlement agreement](#). See a news video [here](#). Progress.
- [A Canopy Of Living Vines](#) - in Jerez de la Frontera lowers the street temperature by as much as 14° F. In the Andalusian town of Alhaurín de la Torre, street shade is from crocheted blankets. Southern Spain is looking for cooling shade in new/old ways. [Details](#).
- [Flash Droughts In Spain](#) - caused record wild fires this past August, driven by a process called 'accelerated evapotranspiration'. Details and a map, [here](#).
- [Two US Natural Gas Pipelines](#) - [Enbridge](#) (Calgary Alberta Canada) has [announced](#) that it will proceed to increase capacity by an incremental 75 Mmcfd for gas customers in the US Northeast via the Algonquin Reliable Affordable Resilient Enhancement project. It will also partner with [ONEOK](#) (Tulsa OK) to build the new [Eiger Express Pipeline](#) (2.5 Bcf/d, 450 miles, 42" diameter) to connect the TX/OK Permian Basin to the Katy Texas hub (near Houston) serving the Gulf Coast LNG market.
- [Successful Test Of Natural Gas Pipeline To Carry Hydrogen](#) - UK energy company [SGN](#) has conducted the first test of this kind on an 18.6 mile segment of the UK's high pressure natural gas pipeline system. Now they will make a plan for the other 7,000 miles.
- [Fairy Circles](#) - point the way to underground Hydrogen deposits, [according to researchers](#) at the University of Vienna, and could reduce the initial cost of developing Hydrogen deposits by showing energy companies like [OMV](#) (Vienna Austria) where, and how deeply, to dig before they start. [Details](#) and a photo.
- [Walkable City Centers](#) - First it was several hundred streets in Paris. Now, on a somewhat more cautious scale, Alexandria Virginia is permanently closing a *third* block of King Street to autos, in favor of creating a pedestrian mall. Video [here](#). More details [here](#).

## Other Science News -

- [World Record For Holding Breath](#) - A Croatian freediver held his breath for [29 minutes!](#) [Video](#) [closed captions on]. Suggested reading: *Stranger in a Strange Land*, Robert Heinlein. [CC]
- [Joby Aviation](#) (Santa Cruz CA) And [Uber Technologies](#) (San Francisco CA) Hook-Up - order your eVTOL air taxi or seaplane ride [from your Uber app](#), maybe as soon as next year. The US Department of Transportation's Federal Aviation Agency (FAA) has issued a [Request for Proposals](#) to accelerate the development of eVTOL aircraft operations in the US. Joby Golf [here](#). Joby partners with [Uber Technologies](#) (San Francisco CA), [here](#).

- eVTOL Integration Pilot Program - The Department of Transportation and the Federal Aviation Administration have been directed to ensure that mature eVTOL (electric vertical take off and landing) aircraft can begin operations in select markets *ahead of full FAA certification*. [Details](#)
- World's Highest Bridge - The [Huajiang Grand Canyon Bridge](#) in Guizhou China is more than 2,000 feet above ground over the Beipan River. The Empire State Building would fit comfortably beneath it! Now open after 3 years of construction. Narrated [Video](#).
- Darth Vader's LightSaber - was sold at auction recently for \$3.6 million. [Photo](#).

Nice Thing - [full screen]

Collection of Lightsaber Duels - In chronological order of appearance, both live action and anim , [here](#).