



Science Notes Archive

Distribution of Potassium Iodide to Residents near Nuclear Plants.

Why? Very simple! The thyroid in your body needs iodine to function normally; that's why, for example, table salt is "iodized," or why people are taking iodine-containing supplements. If terrorists blow up a nuclear reactor, radioactive iodine will be released and, if you are close enough to be exposed, taken up by the thyroid, causing cancer. Taking enough iodide to saturate the thyroid will shut down the thyroid and prevent radioactive iodine pick-up. Any radioactive iodine that finds its way into the body will therefore be quickly excreted in the urine.

As seen on the OREILLY FACTOR and LARRY KING, even government experts agree that other nuclear incidents, from exploding a dirty bomb to a regular nuclear device, is a sad, but much bigger, risk. So, people are looking for, and buying, iodine supplements. THE POTASSIUM IODIDE IS TO BE KEPT IN RESERVE, AND ONLY TAKEN IF A NUCLEAR INCIDENT OCCURRED, AND ONLY IF YOU ARE CLOSE AND TRULY AT RISK. There are tremendous differences in the amounts of iodide (as potassium iodide) in food supplements and in radiation preparedness formulas, and there are risks in taking excess iodide. Before you buy, get some true science facts; on the internet check out the Vermont Dept. of Health info page on potassium iodide, or on www.antiagingforme.com where more details and information are posted.

Saving Eyesight: Two Stem-Cell Studies

In order to be able to see, the cells in the retina of the eye must have a normal blood supply. If the blood vessels have deteriorated and don't supply sufficient blood anymore, dark patches will form in the retina, and sight is terminated at these spots.

At the Scripps Research Institute in La Jolla, California, Dr. Martin Friedlander transplanted stem cells into the retinas of mice that had poor-quality blood vessels and where dark spots already had formed. The transplanted stem cells grew into a durable web of blood vessels and restored normal eye function (Nature Medicine, September 2002).

Earlier work has suggested that stem cells may seek out tissue damage and repair it. To study if stem cells could seek out damaged eye tissue, Dr. Maria Grant and colleagues at the University of Florida injected stem cells intravenously into animals with previously established eye damage. The stem cells did seek out damaged eye tissue and built

functional capillaries there. These findings, published in Nature Medicine (June 2002), could be especially important to people suffering from diabetic retinopathy, wherein the body reacts to disrupted retinal blood flow by quickly building leaky blood vessels that do more harm than good.

Stem Cells Form New Blood Vessels in the Legs

Poor circulation in the legs doesn't cause just severe discomfort. If circulation is severely compromised, gangrene and amputation are definite risks. In a large-scale study performed simultaneously on 45 patients at three medical schools in Japan (Kansai, Osaka, and Kurume universities), doctors injected stem cells right into the leg muscles where circulation was severely hampered. Of the patients, 69% had diabetes. The injected stem cells sprouted their own new blood vessels (Masaki et al., The Lancet, August 10, 2002).

Dr. William Li, Medical Director of the Boston-based Angiogenesis Foundation, who was not involved in the research, explained the significance of this research, which was published in the esteemed British medical journal The Lancet: "This is a truly landmark paper because of its use of stem cells to induce angiogenesis [the birth of new blood vessels]."

A Quick Review of Stem Cells

Stem cells are the original starter cells that can develop into any tissue. Stem cells were first isolated from animal embryos. Almost immediately after this breakthrough, researchers started to explore the potential of stem cells in treating heart, Alzheimer's, and Parkinson's disease; the stem cells showed great promise. However, if the donor cells have DNA different from the recipient's, then adverse immune reactions are a possible risk.

Dr. Michael West of Advanced Cell Technology, Boston, developed a procedure for making individual-specific stem cells. In this process, known as "therapeutic cloning," the DNA and mitochondria of, for example, a skin cell are extracted and injected into a denucleated egg cell. When it is mechanically stimulated to start cell division, this "cloned" cell would start dividing and forming stem cells. Some people find this method objectionable, because in its early stages, it resembles a pre-embryonic stage. I believe this is taking their argument to an extreme. In the process of creating a human embryo, there is a man and his sperm, a woman and her egg, conception, embryo development, etc. All this has little to do with modifying a person's skin cell in order to make an individual-specific stem cell that may restore eye, brain, and cardiovascular health.

Freedom for Children With "Bubble Boy" Disease

A very small percentage of children are born with severe combined immunodeficiency disorder (SCID). One of those children was known as the "Bubble Boy." He was forced to live in a sterile bubble because his immune system functioned so poorly that he was unable to handle the weakest of bacterial attacks. Most recently, two children from Italy and Israel who had a

severe form of SCID—caused by a gene flaw that blocks production of an enzyme (ADA) that is essential to make disease-fighting immune cells—were cured with modified stem cells. Scientists first did gene therapy on stem cells to include the missing enzyme ADA. Then they injected the modified stem cells intravenously into the two children. The treatments were successful. The children were released with healthy, fully functioning immune systems just a few months later (Maria Grazia Roncarolo, *Science*, June 2002). Want to know more about the science of cloning and stem cells? Read a magnificent review article, supported with great pictures, in *MIT Technology Review* (September 2002, pp. 81–85).

Environmental Laws Are There for a Reason

In Northern California's Klamath River, 30,000 chinook salmon died from gill rot. An analysis of available data clearly showed that this devastating loss to the fishing industry could have been prevented if environmental policymakers had been paying attention to how ecosystems work. How so?

First, studies conducted by the California Department of Fish and Game clearly showed that young salmon need a good amount of water to survive and to swim up the Klamath River to reproduce. Yet in March, executives at the U.S. Interior and Agriculture Departments decided to divert a huge amount of water from the river to farmers. As a result, the river's volume of water was reduced by 20% to 30%, making it impossible for the salmon to swim upriver. Forced into shallow waters, which are perfect incubators for disease, they were quickly killed by gill rot. A natural phenomenon? Just bad luck? Neither! Such environmental disasters—from the beaching of whales (that later die from brain hemorrhages) in the Canary Islands to the destruction of thousands of acres of prime forest by fire in Arizona and other Western states—occur on a regular basis and can always be traced back to our violation of ecosystem principles.

Anti-Radiation Pill for Cancer Prevention

As you may recall, the U.S. government gave potassium iodide pills to all 34 states with nuclear reactors. Its reason? If terrorists were to attack a nuclear reactor and dangerous radiation were to be released, taking a potassium iodide pill would help prevent one of the possible outcomes: cancer. It does so by saturating the thyroid, which prevents the uptake of radioactive iodine and, hence, cancer.

Even though California received 400,000 anti-radiation pills last summer, state health officials still can't decide how best to distribute them, thus putting Californians at increased risk should their nuclear facilities be compromised. The earliest distribution would be sometime in January 2003. The bungling by state officials in storing the pills so far away from where they might be needed has so upset the *Los Angeles Times* that it pondered the state's position: "Just how stupid can Californians be? The way the state figures it, they are too stupid to follow simple instructions that would save their lives in a nuclear disaster. That

attitude is more than insulting; it endangers people who need to protect themselves.”

For more details about potassium iodide pills as a protection against radiation, check out the KI Fact Sheet under “Potassium Iodide” at www.antiagingforme.com.

President Supports Plan to Offer Smallpox Vaccine to Public

Most likely due to a study that demonstrated a tremendous number of flaws in the Centers for Disease Control and Prevention’s (CDC) approach to dealing with a terrorist-initiated smallpox attack, President Bush is considering approving a plan to offer smallpox vaccines to all Americans, although strictly on a voluntary basis.

In the study, as described in the weekly magazine Science News, “Scientists from the Massachusetts Institute of Technology and Yale University applied the CDC approach to a hypothetical smallpox attack in which 1,000 people suddenly become infected in a city of 10 million. They found 367,000 cases of smallpox and 110,000 deaths would result.” Further, as the scientists reported in the Proceedings of the National Academy of Sciences, the outbreak “would take nearly a year to quell.” In the new plan, inoculations will most likely start with military and health-care personnel. Thank you, Mr. President!

Two Fuel-Cell Toyotas Go to University of California Campuses

In a continuing effort to establish its low-pollution technology as an industry standard, Toyota Motor Company has announced that two California universities will be its first customers to receive hydrogen fuel-cell autos.

If you haven’t taken a test ride yet in one of the hybrid cars by Toyota or Honda, please consider doing so. This magnificent, close-to-zero-pollution technology is best appreciated by firsthand experience.

Hormone Replacement May Prevent Alzheimer’s

New research published in the Journal of the American Medical Association indicates postmenopausal hormone replacement may be effective for the prevention of Alzheimer’s, if not for its treatment when the drugs are used for 10 years or more. These findings by Veterans Administration researchers add more fuel to the debate over the value—or risks—of hormone replacement.

Bioterrorism: Smallpox

In the past issue of the Journal of Longevity, I expressed doubts about the Department of Health and Human Services’ approach to smallpox, a virus that could theoretically be used by terrorists. Even though the United States now has the potential to inoculate 215 million people, Health and Human Services Secretary Tommy Thompson has restricted access to the vaccine. He and the Centers for Disease Control and Prevention (CDC) believe that the risk of side

effects, which is approximately one death per million doses, outweighs the possibility of terrorists having the capacity to spread the virus. If the virus were to be released, the CDC would quickly send vaccine to the affected area and vaccinate people according to a special plan (vaccines, the CDC tells us, are still effective after infection with the virus), and the outbreak would quickly be quelled.

Unfortunately, I see two major flaws in this approach: First, it takes from 20 to 24 days to show symptoms characteristic of smallpox; yet vaccines are effective for only three to four days after infection. Among those who don't get the vaccine on time, 30% would die; the rest would suffer tremendously and be scarred for life: As described in the weekly magazine Science News, "Scientists from the Massachusetts Institute of Technology and Yale University applied the CDC approach to a hypothetical smallpox attack in which 1,000 people suddenly become infected in a city of 10 million. They found 367,000 cases of smallpox and 110,000 deaths would result." Further, as the scientists report in the Proceedings of the National Academy of Sciences, the outbreak "would take nearly a year to quell."

Second, and more critical, the risk evaluation that weighed vaccine side effects against the possibility of terrorists having the capacity to spread virus was not done by experts on terrorism but by physicians, who based their conclusions on naturally occurring smallpox outbreaks. The risk evaluation also fails to take into account the possibility of virus being spread simultaneously in various localities, or the fact that some in the population may have been vaccinated in their youth and thus would experience fewer side effects.

What do you think of this policy? Ready to call your senators and representatives in Congress and demand that smallpox vaccinations be made available to those who wish to take them voluntarily? You can find their telephone numbers and email addresses online at www.firstgov.gov/Contact/Elected.shtml or by telephoning the Capitol switchboard at (202) 224-3121. For more facts about smallpox and its consequences, vaccines, and terrorism, check out: www.antiagingforme.com/html/defeat_terrorism4.html.

Long-Term HRT Study Halted Unexpectedly

Doctors frequently prescribe hormone replacement therapy (HRT) to postmenopausal women to improve general well-being, increase calcium absorption, and reduce hot flashes. To study the effectiveness of long-term HRT, the government funded an eight-year study but, because of some negative findings, halted it three years early.

The outcomes of interest were: increased incidence of breast cancer (26%), stroke (41%), heart attack (29%), and blood clots in the veins or lungs (111%). Decreases were shown in the incidence of colorectal cancer (37%) and hip fracture (34%). Of 10,000 women in a year, HRT would lead to eight more cases of breast cancer and seven more heart attacks.

Yet, questions remain:

1. Breast cancer. In the 1950s, doctors found that among women with a high incidence of breast cancer, estrogen would linger in the body instead of being metabolized. B vitamins metabolized the estrogens. Question: Did the women in the trial have sufficient vitamin B complex in their diets? Most likely not! Conclusion: Add B vitamins to their diet and continue the study.

2. Heart attack. High homocysteine levels are directly connected to increased risk of heart attack yet often can be decreased with folic acid. Question: Did the women in the trial have sufficient folic acid in their diets? Most likely not! Conclusion: Add folic acid to their diets and continue the study. (Similar nutritional factors are known to thin the blood, reducing blood clots.)

3. Hormones. Were the study participants given natural hormones? Answer: No! The estrogen used actually is an extract from pregnant mare urine. Conclusion: Prescribe a true regimen of natural hormone replacement and continue the study.

I believe the purpose of this government-sponsored (incomplete) study was to prove the value of synthetic drug hormone replacement. It is unfortunate that taxpayers' dollars were not more wisely spent on comparing synthetic drug HRT versus natural hormones in order to offer women safe alternatives instead of dire warnings.

New Peptide Blocks Anthrax Action

When inhaled, anthrax spores unleash three proteins that combine to form a toxin (triad). First, a protein called protective antigen (PA) binds to a receptor on the cell surface. An enzyme then cleaves this protein. The part still stuck to the cell surface, chemically defined as PA63, then serves as a docking anchor for lethal factor and edema factor, the other two anthrax proteins. As lethal factor enters, it destroys the cell by chopping up its constituent proteins, creating the symptoms of anthrax.

In a wonderful breakthrough chronicled in the October 2001 issue of Nature Biotechnology, John Collier of Harvard Medical School synthesized an apparently nontoxic molecule that inhibits this poisoning mechanism by preventing natural anthrax proteins from binding to PA63: polyvalent inhibitor (PVI). In tests, injected PVI protected animals even against 10 times the minimum lethal dosage of anthrax.

Cloning: Great Science Totally Misunderstood

Recent headlines such as “U.S. Scientists Use Cloning to Create Human Embryos”—from the November 26, 2001 issue of the Los Angeles Times—have caused alarm by leading readers to conclude that researchers have learned how to produce a cloned baby. Nothing could be further from the truth—nor would it make any sense. Using stem cells to repair failing body parts is easier than cloning a human being for those spare parts. However, ethics aside, stem cells derived from animals or other humans possess DNA different from that of the recipient, raising concerns over their possible rejection. Using a person’s own stem cells would be ideal, but the question remains how to reproduce them.

This issue is the one researchers at Advanced Cell Technology in Boston were tackling. Whereas, according to the most conservative definition, embryos comprise at least 150 cells, these scientists were producing “blastocysts,” which consist of only a few cells. They certainly weren’t manufacturing human beings!

I’ll even give you a reality-based example showing how harmless their research was. If I rub one of my hands quickly and vigorously against my other forearm for a few seconds, I scrape off—kill—several thousand skin cells. Of course, this is no big deal; my body will promptly replace them. However, opponents of cloning would call me a mass murderer because each of those skin cells theoretically could be chemically stimulated to divide to form a blastocyst, which theoretically could be chemically triggered to become an embryo-like bunch of cells, which theoretically could be coaxed to develop into a humanlike embryo. But am I really a murderer?

These scientists were able merely to stimulate a person’s skin cells to start dividing and, hopefully down the road, grow into stem cells. Those stem cells, which would run no risk of rejection (because they would contain the person’s own DNA), could be used to activate the body’s defenses and treat many diseases, from Parkinson’s to Alzheimer’s to heart disease. Scientists have even been able to grow a kidney from stem cells. Now, that’s medicine!

Mad Cow Disease Now Detectable

Until the recent discovery by Dr. Gideon Shaked and his colleagues at the Department of Neurology at Hadassah University in Israel—published in the August 24, 2001 issue of the Journal of Biological Chemistry—there had been no way to test for mad cow disease. Only once it was too late to do something about it would the disease become totally obvious in cows, and thousands of them would have to be destroyed. The risk was too great for people who consumed meat from infected cows long before the disease progressed to this final, visible stage, so many quit eating beef.

This situation makes the work of Dr. Shaked so valuable. He and his

team identified a protease-resistant peptide in the urine of animals infected with mad cow disease: UPrP(Sc). This peptide can be detected well before the appearance of clinical symptoms, and further development of this test will make it possible to identify infected animals not only before they can transmit the disease to other animals but also before they either are slaughtered for meat or are mistakenly killed and burned because they're believed to be infected.