



dry eye: December 6, 2006



pass surgery



Attn: Arm - need splint,

confirm: Foot - tinea pedis?

JPHAS

Journal for Pre-Health Affiliated Students

WINTER 2006 VOLUME VI ISSUE I

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JPHAS Mission Statement

The Journal for Pre-Health Affiliated Students (JPHAS) was created in May 2001 to more fully recognize the broad spectrum of pre-health students at the University of Illinois at Chicago. JPHAS strives to offer students considering careers in health-orientated professions a valuable, informative resource and a forum to express, present, and exchange ideas. In doing so, JPHAS aspires to strengthen the network of support for pre-health students.

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Letter from the Editors

We are proud to present the Winter 2006 issue of the Journal for Pre-Health Affiliated Students (JPHAS) at the University of Illinois at Chicago.

Five years ago, the Pre-Med Journal transitioned into the Journal for Pre-Health Affiliated Students. Since then, our journal has grown into a diverse compilation of articles regarding healthcare and its delivery from many multidisciplinary perspectives. We present information, news, research, and opinions to inform our readers of developments and current issues in the healthcare industry.

Last year, most of our editorial staff graduated. Thus, this year, we faced a unique challenge of recruiting and developing our new staff. We hope that the new perspective our journal has gained as a result of this challenge advances the quality of our journal.

In addition to maintaining JPHAS as a biannual journal, we have retained this Winter issue as a general overview of many broad topics and our upcoming Spring issue will be devoted to a single theme in healthcare.

This issue is a testament to the hard work and dedication our writers, artists, and editors have devoted to its production. The cover exemplifies the wide variety of topics of interest in healthcare and reflects some of the body parts that are the subjects of certain articles in this issue. The central eye represents the important role that perception plays in all aspects of healthcare from disease to the future of the industry.

In order to produce a quality journal we require support. We sincerely thank the UIC Department of Biological Sciences, Undergraduate Student Government, and UIC Honors College for their generous contributions which made this issue possible.

We encourage and welcome responses and suggestions from all readers to improve our journal and wish that our readers will decide to take an active role and become involved in our future issues. We hope our journal furthers our readers' knowledge and interest in the healthcare industry.

Sincerely,

Shripaad Shukla and Kyaw Sint
Co-Editors-in-Chief

Uganda's Remarkable Response to the AIDS Crisis

by Priscilla Kunamalla

At the mention of AIDS, one is often faced with vague statistics and ambiguous jargon, which hardly seem to relate to the "realities" of our western world. However, in underdeveloped, third world countries, these figures represent the uncertain existence of millions who are dying without cause. I was fortunate enough to travel to Uganda in the summer of 2006 with Youth with a Mission, and consequently, my perception of AIDS and other global issues has been dramatically altered. Uganda is a land that possesses such overwhelming physical beauty, yet its people have been ravaged by decades of uncontrolled death and destruction. In this paradox, one can sense the struggle within the nation to reclaim its authority over this vicious yet preventable outbreak.

Today, the rapid increase of AIDS around the world has reached unprecedented proportions, demanding the term "epidemic" to emphasize the magnitude of its widespread effects. While its devastation is rampant in nearly every country worldwide, it has most severely infiltrated populations in African nations, specifically in sub-Saharan Africa. To put things into perspective, contemplate this: of the 36 million individuals living with HIV/AIDS today, two-thirds are in sub-Saharan Africa [1]. In effect, the virus is paralyzing countries such as Ethiopia, Kenya, South Africa, Botswana, and Namibia, causing life expectancies to drop, economies to suffer, and millions of children to be abandoned with little chance of survival. Despite this, one instance offers us a speckle of hope. The nation of Uganda, once host to the most prevalent rates of AIDS infections in the world, is now regarded as a rare success story due to the effectiveness of its HIV/AIDS control and prevention efforts. Through its extensive prevention programs, Uganda's AIDS prevalence rates have decreased from 18 percent in 1993 to 6.2 percent in 2002 [2]. The knowledge gained by examining Uganda's strategy to contain the staggering effects of HIV/AIDS is vital if our society is to have any chance at tackling the virus on a global level.

Prior to its success in decreasing rates AIDS infections, Uganda had been one of the first countries in the world to experience the horrific impacts of the disease. It is estimated that between 1966 and 1986 over one million Ugandans lost their lives to HIV/AIDS, a statistic that ranked Uganda as having the highest



The YWAM AIDS Medical Center Staff (many are HIV+ themselves). Together they manage the clinic and oversee various outreaches that the medical center facilitates. (Photo by Priscilla Kunamalla)

rates of HIV/AIDS in the world [2]. However, the late 1980's brought Yoweri Museveni, Uganda's current President, into power, which assuredly contributed to the country's response to the epidemic. President Museveni is lauded as a key figure in Uganda's successful approach to HIV/AIDS due to his public acknowledgement that HIV/AIDS is a serious threat to the nation's security as opposed to a mere "health issue," as other officials have claimed it to be. Expressing deep commitment to this cause, he encouraged all other sectors of Ugandan civilization to take an active role against the spread of AIDS. This included political programs, intervention through education, counseling, community support for AIDS victims, and increased availability of testing centers throughout the country [2,3]. Uganda's Ministry of Health, in collaboration with the United Nations' World Health Organization, pioneered the AIDS Control Program (ACP), which became the first of its kind to incorporate international, national, and local partnerships in the fight against AIDS. The ACP coordinates over 1,000 HIV/AIDS-related organizations in Uganda and aims to broaden its reach to all facets of the population. It oversees national organizations such as the Uganda AIDS Commission, the District HIV/AIDS Committee, and the AIDS Support Organization, the first community-based effort to provide direct support for AIDS patients and their families [4]. Here we see how essential a multifaceted plan is in claiming a nation back from the reigns of this deadly epidemic.

Uganda's relationship with international and non-governmental organizations (NGOs) also played a critical role in drawing international attention to AIDS. Uganda's Minister of Health Dr. Rukhakana Ruganda took a leap of faith when he appealed to delegates at the World Health Assembly for international support in Uganda's battle with HIV/AIDS. In 2004, the Uganda AIDS Commission applauded Dr. Ruganda's efforts, stating, "[His] simple words were a frank and courageous admission that would have enormous implications for Ugandans as well as many others in a fight against AIDS" [2]. Since his requests, Uganda has seen a substantial influx of support with international and non-governmental organizations (NGOs) also played a critical role in drawing international attention to AIDS. Uganda's Minister of Health Dr. Rukhakana Ruganda took a leap of faith when he appealed to delegates at the World Health Assembly for international support in Uganda's battle with HIV/

AIDS. In 2004, the Uganda AIDS Commission applauded Dr. Ruganda's efforts, stating, "[His] simple words were a frank and courageous admission that would have enormous implications for Ugandans as well as many others in a fight against AIDS" [2]. Since his requests, Uganda has seen a substantial influx of international organizations that are willing to design strategies and to provide medical aid throughout the region. Uganda's openness and accessibility encouraged organizations such as the World Bank, the World Health Organization, the United States Agency for International Development, and the United Nations Development Programme to establish bases in Uganda as sites for drug testing, research trials, and development efforts for HIV vaccinations and treatments. Consequently, in 1998, Uganda became one of the first African countries to pilot antiretrovirals (ARV's), the primary treatment drug for HIV, and in 1999, it became the first African country to test an AIDS vaccine candidate [2]. Uganda has illustrated the vital point that without the definitive action of political leaders and the backing of national and international organizations, the issues of AIDS will never be effectively resolved.

Education, too is at the forefront of Uganda's goal to contain HIV/AIDS. Sex education programs are being implemented into the curriculum in many schools, prompting open discussions with Ugandan youth, many of whom carry deeply embedded misconceptions about the transmission of the virus and about those who contract it. Aggressive health education campaigns on televisions and radio broadcasts across the country target teenage and young adult populations as well. Uganda has also opened facilities to educate adults and older citizens in rural districts, who still believe that AIDS is a punishment from God and that sexual promiscuity does not result in AIDS [5,6]. Combined with governmental programs, these educational initiatives have caused HIV prevalence rates to decrease by over 50 percent since 1992 [7]. To its credit, Uganda's administration has recognized that education is at the heart of preventative measures against HIV/AIDS. Not only is this acknowledgement bringing gradual declines in the rates of new infections, but it also serves as a model for other nations to utilize in order to see similar results.

While government officials and educators may be employing aggressive tactics to eradicate HIV/AIDS, it ultimately requires the will of the people to turn those efforts into realities. Uganda's progress in lowering the rates of AIDS infections can be attributed to the widespread implementation of social projects that are being organized by everyday Ugandans to reach out to their communities. Information is being spread by word of mouth through theater groups, singers, and local resistance committees who have dedicated themselves to being honest and telling the public the truth about AIDS [5]. Faith based organizations such as the Islamic Medical Association of Uganda, the Protestant and Catholic churches, and other religious institutions have also advocated abstinence and monogamy which, regard-

less of religious affiliation, are key pillars in the fight against AIDS.

Through their collaborative efforts, the citizens of Uganda are proving to the world that solidarity and allegiance towards a common goal could mean the difference between the success and failure of a national endeavor to control AIDS. If Uganda's national initiatives continue to flourish, its declining rates of infection will save thousands, if not millions, of lives and can bring hope to the rest of the world that the battle against HIV/AIDS is not in vain.

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A "Women's Group" meeting in the village of Chimole, where staff/counselors from the YWAM AIDS Medical Center discuss personal health, women's issues, AIDS symptoms, AIDS prevention, and HIV testing. (Photo by Priscilla Kunamalla)

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Sleep Deprivation Takes Toll on Bodily Functions

by Robin Zhou

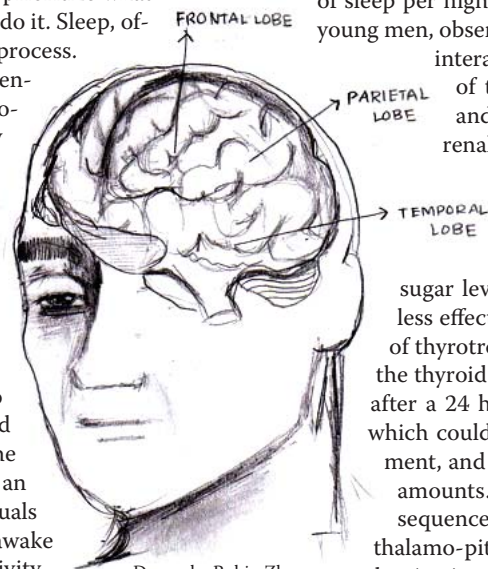
We live in a fast-paced world. Everyday, people prioritize what needs to be done in what little time they have to do it. Sleep, often times, gets pushed to the back burner in the process.

Research studies have found that this is a detrimental mistake, especially to the body's functional processes. Sleep is an essential aspect of our daily regimen, directly affecting not only the use of brain power but the function of the body's hormones and metabolism.

The most obvious consequence of sleep deprivation is its affect on the brain's cognitive processes. The human brain is very flexible. It is this flexibility that allows for another part of the brain to take over if the original part fails to function. It is also this flexibility that is activated when one's body is sleep deprived. Scientists at the University of California, San Diego conducted an experiment on thirteen healthy, young individuals who took a verbal learning test after remaining awake for 35 hours, using fMRI scans to show brain activity. Though the researchers hypothesized that the prefrontal cortex of the brain would be less efficient in fulfilling cognitive demands, their data actually revealed that the prefrontal cortex was more responsive after being sleep deprived. In addition, the temporal lobe, known as the language center, which is normally activated after normal sleep, was not activated after sleep deprivation and the parietal lobe, which is responsible for complex roles such as planning, normally not activated after normal sleep, was activated after sleep deprivation. Thus, while compared to a well rested brain, free recall was greatly inhibited in a sleep deprived brain, the better-than-expected free recall in the sleep deprived brain was attributed to the activation in the parietal lobe. The results from the study indicate that when the brain attempts verbal learning after sleep deprivation, dynamic, compensatory changes occur in brain activity. In this case, the parietal lobe, one of the most active lobes, and the prefrontal cortex are shown to take the brunt of the compensatory shift [1].

But even as part of the cortex is being overworked, results are nominal, since performance is still shown to be declining. Another experiment undertaken by the team at UCSD required that the subjects perform serial subtraction under both well-rested and sleep deprived conditions. It was demonstrated that subjects could answer more arithmetic problems correctly when well-rested than when sleep-deprived. There may be several different explanations for this. One is that the parietal lobe is not familiar with the type of work done by the temporal lobe. Thus when work is transferred to the new section of the brain, some accuracy and speed is lost in the process, leading to a deterioration of efficiency when accomplishing the task [2]. Notably, the results from the research study also showed that activation declined in the frontal and parietal lobe while completing the arithmetic test. This would indicate that the effects of sleep deprivation on cerebral activation and processes are task-specific [1].

While previous studies focused on only the cognitive consequences, later studies began to shift their focus to the physiological effects of sleep deprivation. One research study discovered that a lack of sleep



Drawn by Robin Zhou

impeded the production of metabolic and endocrine regulating hormones. Scientists at the University of Chicago followed the health of eleven young men in their twenties restricted to only four hours of sleep per night. After six days, the researchers examined the young men, observing metabolism, thyrotropic function, and the interactions between the hypothalamus, the portion of the brain which regulates metabolic processes and autonomic activities, and the pituitary and adrenal glands, which are both endocrine regulating glands. The results showed that the subjects' level of insulin, which regulates blood sugar, was reduced. In fact, it took sleep-deprived subjects 40 percent longer to regulate blood sugar levels after a meal, and subjects were 30 percent less effective in regulating insulin [3]. The concentration of thyrotropin, which regulates the endocrine function of the thyroid gland, was seen to have significantly decreased after a 24 hour period of sleep loss. The level of cortisol, which could lead to high blood pressure, memory impairment, and weakened immunity, was available in excessive amounts. The increase in cortisol level may be a consequence of negative feedback regulation in the hypothalamo-pituitary-adrenal axis which accompanies sleep deprivation. These results mirrored symptoms observed in normal 65-year-old men, indicating that lack of sleep may also mimic the aging process. This also suggests that sleep loss may increase the impact of age-related disorders such as diabetes or hypertension. [3].

One prominent aspect of physiological consequences is the damage of sleep deprivation on the body's metabolic processes. Professor Francesco Cappuccio of Warwick Medical School undertook a research study on almost 47,000 subjects and found that shorter sleeping time correlates with almost a two-fold increase in risk of obesity. Specifically, lack of sleep was seen to be accompanied by a greater body mass and a larger waistline over time. Professor Cappuccio speculated that these observations may be caused by two hormones known as ghrelin and leptin [4]. Ghrelin is a hormone that lines the fundus of the human stomach and stimulates appetite, while leptin regulates energy processes and suppresses appetite. When an individual is sleep-deprived, more ghrelin and less leptin are produced. Earlier, research at the University of Chicago produced similar results. The subjects were healthy, young men who slept only four hours a night for six days. After the testing period, researchers noted an approximate 19 percent decrease in leptin levels and a 28 percent increase in ghrelin. There was also a 24 percent increase in appetite for sugary, salty, or starchy foods. While more research is needed to fully understand and link lack of sleep to obesity, studies have already begun to set the basis for the connection between the two [5].

The trend is continual: in the past century, the hours of sleep individuals get per night have been steadily decreasing. In fact, at the moment, millions of individuals get less than six hours of sleep every night [6]. This drop in sleeping time is taking a toll on the human body, not just on mental processes but on bodily functions as well. So what are possible solutions to alleviate the consequences of sleep deprivation? One solution is to take short naps. Studies have shown that taking naps improves performance, memory retention, and overall mood. And then there is the most basic thing we could do: learn to regulate our time. Perhaps in the spectrum of our daily lives, making time for sleep is more important than we have all thought.

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Attention Deficit Disorder: A Cultural Construct or Biological Disorder?

by Kacie McMahon

Of all the childhood psychiatric disorders, attention-deficit disorder and attention-deficit/hyperactivity disorder, better known as ADD and ADHD, respectively, are the most commonly diagnosed. Distractibility, impulsiveness, and hyperactivity are some of the symptoms of these increasingly detected disorders. With the upsurge of patients being diagnosed with ADD and/or ADHD, there has been much speculation surrounding the validity of these disorders. Experts in both medical and psychological fields have frequently scrutinized questions as to whether ADD and ADHD are linked more to cultural constructs or are real biological disorders.

The vast majority of ADD/ADHD diagnoses are given in the United States, and within this country, according to a 1999 survey, the rates vary from 1.6% of school age children in San Juan, Puerto Rico, to 9.4% in Atlanta, Georgia [1]. With such an increased rate of children in the United States being diagnosed with ADD/ADHD, it is no wonder that questions of misdiagnoses have arisen; although, it may also be questioned whether children from upper-class families are being over-diagnosed or if children from lower-class families are just not being diagnosed at all. According to a survey released in September 2000, physicians think that as many as half of the cases of ADD/ADHD go unrecognized. There is evidence that poor and black children and those who lack private insurance or Medicaid are less likely to receive a diagnosis [1]. There are many cases in which children who need to be on stimulant therapy for ADD/ADHD are neglected, and also cases in which children are put on drugs for no good reason. Over-diagnosing leads to difficult issues when children are put on medication for ADD/ADHD just because they are acting up in class, instead of having an actual psychologi-

cal disorder. There are numerous discrepancies in diagnosing these disorders, and there is a thin line between misdiagnosing and not diagnosing at all.

The rise in diagnoses of ADD/ADHD has, in turn, caused a subsequent increase in the number of patients taking prescription stimulants. This can be cause for serious concern for those patients who have been misdiagnosed and also for those who have not been diagnosed at all. ADD and ADHD are real neurological disorders and need to be taken as seriously as any other mental illnesses. Simply prescribing unruly children stimulant drugs such as Dexedrine (dextroamphetamine) and Ritalin (methamphetamine) is problematic as demonstrated by recent studies that have been investigating the risk of addiction in these types of drugs, especially in those patients who do not need them in the first place [2]. Careful diagnoses and extensive tests can help to avoid the influx of prescription medications and, hence, derail problems with addiction. As for those patients who have been accurately diagnosed, many of their parents and physicians opt for stimulant therapy as a quick, cure-all step in treating ADD/ADHD and rarely follow up on important behavioral and cognitive therapies necessary for these disorders. Due to the complexity of these disorders, it requires much more complex therapy than simply prescribing medication; psychotherapy should be the primary focus of treatment [3].

While there is an over-abundance of patients being diagnosed with ADD/ADHD in the United States, patients in some countries are rarely diagnosed with these disorders; it really depends on where one lives in the world. The rate of stimulant use, for example, is as much as 10 times higher in the United States than in Great Britain [4]. However, within the United States, it has been noted that blacks and Hispanics are less likely to receive the diagnosis than whites. A study last year found that African American parents regard the problem chiefly as misbehavior and do not like to seek help outside the family [4]. Many patients, whether within the United States or not, do not trust their physician's diagnoses and neglect the seriousness of the disorders due to fear of stigmas. Nevertheless, despite questions regarding their validity as biological disorders, experts in the fields of ADD and ADHD believe the disorders occur in similar fashions all around the world. These disorders look the same in every way in Brazil as they do in the United States. There may be room for cultural variation; however, for the most part, symptoms look very much the same [4].

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Weight Loss Pills, A Dangerous Alternative

by Asima Ali

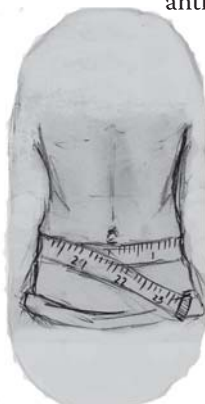
Weight loss pills are drugs designed to reduce body mass through suppressing appetite, increasing the body's metabolism, and interfering with the body's ability to absorb nutrients from food. It is suffice to say that advertisement of weight loss pills is far from lacking; from the catchy slogans to the before-and-after pictures, weight loss pills are everywhere in the media. However, increased use of the pills has produced many adverse effects on those trying to reduce their body mass...effects that, in some cases, could lead to death.

There are many chemicals that constitute weight loss pills, the most popular ones being phentermine, ephedra, and catechin-polyphenols (derived from green tea and used in conjunction with caffeine). Phentermine is a drug that functions as an appetite suppressant by altering neurotransmitters, chemicals in the brain that transmit impulses across brain cells, also known as neurons [1]. Specifically, phentermine stimulates neurons that in turn release neurotransmitters such as catecholamine and norepinephrine, which affect appetite and digestion [2]. A common phrase for the effect of neurotransmitters of this sort is the "fight or flight response." Basically, the body curbs hunger signals, which results in a suppression of appetite [2]. Phentermine was first introduced in the U.S. in 1959 and then withdrawn from markets in March 2000 by the European Commission due to the serious side effects of the drug, which include increased heart rate, increased blood pressure, stroke, high risk of heart disease, and hypertension. Currently, phentermine is available for short-term use in the U.S. and Australia [3].

Ephedrine, also known as ephedra or ma huang, is a drug designed for appetite suppression and an increase in energy. Ephedrine was first introduced in Denmark in the 1970s, but by February 2004, the Food and Drug Administration (FDA) banned it due to serious adverse effects related to the cardiovascular and central nervous systems. Some of these effects include hypertension, palpitations, tachycardia, myocardia, myocardial infraction, stroke, psychotic episodes, seizures, and death [3]. Ephedrine was once a component of products such as Metabolife, Diet Fuel, Stacker 3, Hydroxycut, and Metabolift [4]. Yet research has shown that ephedrine does not effectively promote weight loss. Its use doesn't demonstrate even a modest amount of weight loss. Nevertheless, in 2005, the U.S. District Court in Utah ruled that federal law prohibits the FDA from banning dietary supplements that contain ten milligrams or less of ephedrine [4].

Another chemical supposedly known to reduce body mass is catechin-polyphenol in green tea [5]. Due to its wide consumption in Japan and China for centuries, scientists acknowledge that it is a safe chemical that may have more benefits than simply quenching one's thirst for a soothing, warm beverage. In the

past, green tea was recognized to have antioxidant properties, capillary strengthening capabilities, antibacterial effects, and antidepressant effects [5].



Drawn by Robin Zhou

In an article in the *International Journal of Obesity*, Abdul Dullo demonstrates that green tea shows promise for reducing body mass. He states, "Our studies...raise the possibility that the therapeutic potential of the green tea extract, or indeed a combination of EGCG and caffeine, may be extended to the management of obesity" [5]. He goes on to conclude that green tea has potential to be used as a dietary supplement because it increases the burning of calories and fat, which in turn leads to weight loss. Thermogenesis is the production of heat due

to digestion, absorption, and the breaking down of food [5]. More energy by-product formed means that less fat is stored. Studies have shown that caffeinated green tea increases thermogenesis by 28 to 77 percent, depending on dosage, whereas caffeine alone doesn't produce any such increase [5].

However, these promising results have only been produced through experimentation on animals rather than humans. Thermogenesis has a more active role in rats than in humans; therefore, until further research is done, one cannot fully determine the capability of green tea as a weight loss supplement [5]. Still, green tea isn't harmful to the body in moderation, and if it is used in conjunction with exercise and healthy eating habits, it may have a higher likelihood of promoting weight loss.

Dietary supplements such as weight loss pills may not be lacking in advertisement, but they do lack in evidence of effectiveness. Drugs that have been deemed safe and effective today may not be so in the future, as was the case with ephedrine. The same drugs can lead to serious health problems, an uncomfortable lifestyle, and even death. Exercise and a healthy diet should always be the first weight loss routine initiated before considering a dietary supplement.

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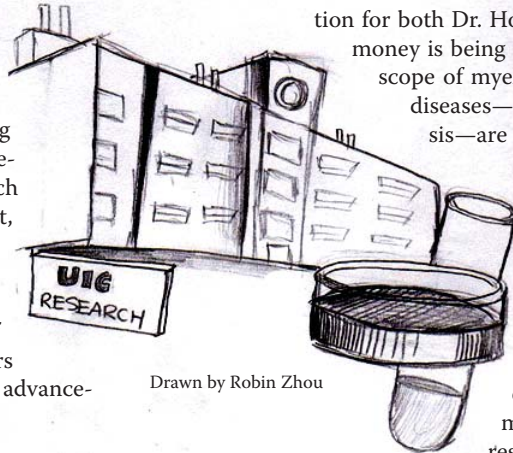
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UIC's Stem Cell Research

by Nishit Shah

Five years ago, the first seeds of controversy emerged in a growing debate about stem cells, research, and funding. However, even with financial setbacks, research has progressed across America due to a number of generous grants, revealing a great amount of potential. Within the Midwest, Illinois has taken a leading role in the study and progression of stem cell research, and a leading participant in this research is the University of Illinois at Chicago. In fact, UIC is one of 88 Carnegie Research I universities, a title reserved for U.S. universities that have received the highest amounts of federal science research funding. With the help of various state and national grants, researchers at UIC are continuously discovering scientific advancements in a number of different disciplines.



Drawn by Robin Zhou

Stem cell research at UIC continues to be at the forefront of medicine. This is largely due to the limited funding provided by the federal government and the increased efforts of the newly created Illinois Regenerative Medicine Institute (IRMI). Governor Rod R. Blagojevich launched the IRMI in summer 2005 to provide state funding and support for stem cell research. Providing large amounts of grant money, this institute has allowed for an increase in stem cell research at Illinois state institutions. Recently, the IRMI gave three researchers at UIC funding to extend research within their respective fields [1].

Accumulating an overall total of \$2.25 million, the stem cell grant money will allow further research in topics ranging from pancreatic islet transplantation to spinal cord reconstruction [1]. This money, received on August 19, 2006, also contributed towards the financing of the Center for the Development of Stem Cell Therapies for Human Diseases, a new institution created solely to explore stem cell therapy and research, one of only a few in the United States. Dr. Jasti Rao, professor and head of cancer biology at UIC College of Medicine at Peoria, was awarded \$1.1 million to study and research the behavior of cord blood stem cells in cancer and spinal cord injury [1]. Cancer cells react quite differently to stem cells, and early manipulation has identified the possibility of shrinking tumors, thus slowing down cancers. Dr. Rao's research in stem cell reactivity resonates very closely to his work with cancer, specifically Glioma tumors, which occur when glial cells of the central nervous system become cancerous, destroying neural pathways and axons [2].

Researchers are also studying human umbilical cord stem cells in a multitude of processes. For example, researchers are trying to transform umbilical stem cells into liver beta cells. The absence of beta cells leads to diabetes, so to be able to transform stem cells into beta cells may give some diabetic patients the ability to produce insulin again. An earlier grant also allowed the study of umbilical cord cells in the recreation of cardiovascular tissue [3].

The largest grant ever imparted to UIC in the medical field, however, has been towards the prevention of over-proliferation of cells without using stem cell transplants. The National Cancer Institute granted \$19.6 million to Dr. Ronald Hoffman, professor of oncology, on Sep-

tember 6, 2006. Dr. Hoffman will not only participate but also lead an international team in clinical research in two myeloproliferative (blood) disorders related to bone marrow failure [2]. Currently, the only treatment is a bone marrow stem cell transplant [4]. An impressive distinction for both Dr. Hoffman and the University of Illinois, the grant money is being used in a number of different areas under this scope of myeloproliferative disorders. Even though the two diseases—polycythemia vera and idiopathic myelofibrosis—are relatively rare, the research study includes different topics that make it more relevant. [5]

This is only the tip of the iceberg. The research discussed above represents the pinnacle of new studies and is a shining example of UIC's ability as a research institution. However, researchers also pursue opportunities in various fields of psychology, neuroscience, biology, and biochemistry. Furthermore, many undergraduate students participate in research, often taking advantage of the Honors College's list of undergraduate research opportunities [6]. Coupled with the high amount of undergraduate research is the UIC Research Symposium, established in 1999 [7]. The importance given to undergraduate research at UIC is unique and allows students to collaborate with professors.

With such a large focus on research, UIC has a range of studies underway. The tissue-engineering wing at the College of Dentistry, for instance, has presented an opportunity for both undergraduate and graduate students to receive training in stem cell research procedures and protocols, ultimately dealing with the synthesis of skeletal materials in the regeneration of bone, cartilage, and teeth [8]. An exciting new field of study, this is only one of many upcoming opportunities that involve the UIC community and its commitment to research.

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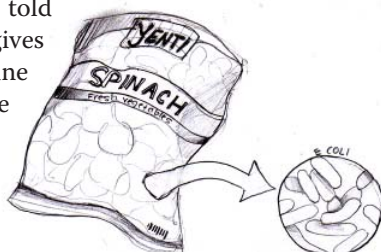
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Contamination of Spinach by E. Coli

by Pratik Shah

From a young age, we are told the benefits of spinach. It gives strength and keeps our immune system healthy. However, the latest outbreaks of E. coli have been linked to contaminated spinach by researchers across the globe. How can this be so?



Drawn by Robin Zhou

Has spinach lost its good reputation? Spinach is still the heart-healthy vegetable Popeye had once promoted so enthusiastically with great amounts of vitamin K, A, manganese and folate [3]. Spinach has also been found to contain at least 13 different anti-cancer compounds, which function as antioxidants [3]. When did such a food get placed on the list of the most unpopular vegetables?

In August 2006, a major outbreak of E. Coli spread through the United States and parts of Canada through contaminated spinach, resulting in 3 dead and 193 sick. The Canadian Food Inspection Agency issued recall orders and blocked U.S. spinach imports after learning of the outbreak [1]. The contaminated spinach was found to have originated from 3 counties in California's Salinas Valley and San Bautista, California.

According to the FDA, E. coli is a bacterium that can cause diarrhea and eventually lead to kidney failure and death. It lies in the intestines of cattle and other animals and is linked to contamination by fecal material. E. coli causes an estimated 73,000 infections in the United States each year, including 61 deaths annually, according to the Center of Disease Control [4].

Not only has this epidemic affected consumers but also businesses as well. Many chain stores have allegedly produced contaminated spinach due to their process of packing spinach. Like most food, spinach travels from the field to a central facility where it is mixed with spinach from other fields in order to be processed. If any of the spinach is tainted, the threat to people is amplified as leaves are washed, dried, bagged, and shipped throughout the country [2].

The encouraging news is that the Food and Drug Administration has recently lifted a two-week consumer warning on fresh spinach after being informed of the possibility that environmental-law violations could have been the reason for the woman's death. The FDA, the state of California, the Centers for Disease Control and Prevention, and the United States Department of Agriculture are continuing to investigate the causes of this outbreak in order to control its current spread as well as prevent future outbreaks. Such investigations include continuous inspections and sample collections in facilities, the environment

and water, as well as studies of animal management and water use [3].

The main way consumers can protect from such a disaster is to take careful precautions. Thoroughly washing and cleaning leaves before use is important not only for spinach but for all fruits and vegetables. Also, making sure of the condition of the spinach before purchase is important not only for customers but also for the store especially if they are notified by customers of potentially contaminated spinach.

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American Red Cross Fined \$4.2 million

by Irena Jatskiv

Since Clara Barton founded the American Red Cross in 1881, the organization has been guided by its continuous dedication to humanity [1]. Within the last decade, however, the Red Cross has floundered in regards to its historic expectations.

Over the years there has been an ongoing battle between the Food and Drug Administration (FDA) and the American Red Cross (ARC). On September 8, 2006, the FDA charged the American Red Cross \$4.2 million for failing to carry out several procedures in the vital screening process in collecting the donors' blood. The violations included breaches of Good Manufacturing Practice (GMP), which means that the Red Cross was consciously failing to ask appropriate questions of the prospective donors. Although the Red Cross accumulates 45 % of blood donated in the US each year for transfusions and there have been no linked reported cases, the FDA fears that failure to follow numerous precautions increases the chances of patients receiving contaminated blood, which could be potentially fatal [2].

As a result of investigation the FDA uncovered that this was not the first blood recall; the new fine arises from Red Cross recalls in the US between 2003 and 2005 (which could have been prevented). Previously as a legal binding decision, ARC was fined \$5.7 million for having insufficient and outdated blood safety systems. The Red Cross promised to be responsive to the matter; however, they have lapsed yet again. By avoiding imperative safety measures, the ARC continued to increase the risk of dispensing Human Immunodeficiency Virus (HIV) or other transmittable viral agents [3].

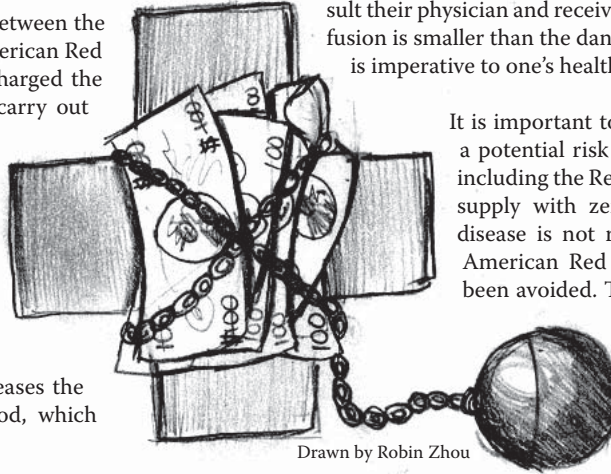
In 2005, the Canadian Red Cross (CRC) pleaded guilty to distributing contaminated blood supplies which infected thousands of Canadians with HIV and hepatitis C (an infection of the liver that is caused by an RNA virus, which if not treated by a liver transplantation could be fatal). The CRC dispersed tainted blood in the 1980's and by 1997, there were 1,000 people infected with HIV and about 20,000 others that had contracted hepatitis C through the blood products and transfusions. In total, over 3,000 people have died since receiving the CRC's tainted blood. Dr. Pierre Duplessis, head of the CRC, issued an apology to the affected persons and stated that the organization takes complete responsibility for distributing contaminated blood to those that relied on their charity and assistance. After receiving much criticism and legal power struggles because of the tainted-blood scandal (which led to a myriad of lawsuits), the CRC was stripped of its role and was entirely replaced by a new Canadian government organization [4].

In compensation, the ex-CRC has set aside \$1.2 million for medical research, as well as scholarships for family members of those affected. The CRC has paid victims \$55 million in separate funds [5].

The ARC helps in wars, fire, floods, volcanoes, hurricanes, tsunamis, tidal waves and droughts-yet it is most recognized for the encouragement of civilian blood donation, but the blood donation process was haphazardly handled and as a result the FDA fined the Red Cross [1].

To correct their mistake the Red Cross will not use donated money to pay off the fine- as an alternative, the organization will depend on work-

ing funds which include revenue gained from the sales of blood products. Furthermore, the ARC has to comply with FDA rules by improving their training and data-processing methods. Because blood products always carry a degree of risk, it is vital that a grand industry such as the ARC complies with all federal laws and FDA regulations. As this issue is settled, the FDA continues to advise care providers and consumers about protections; patients who are in need of a transfusion should consult their physician and receive it. The danger of receiving a transfusion is smaller than the danger of failing to receive one when it is imperative to one's health [2].



Drawn by Robin Zhou

It is important to keep in mind that there is always a potential risk for inaccuracy on anyone's behalf, including the Red Cross'. After all, achieving a blood supply with zero risk of transmitting infectious disease is not realistically possible. However, the American Red Cross' recent blunder could have been avoided. The ARC should not avoid learning from the awful mistakes of others; after all, thousands of innocent people became victims of the CRC tainted-blood scandal. The ARC should learn from their past mistakes as well as from the others and most importantly aim to uphold the organization's dedication to humanity which the founder intended 125 years ago.

The mishap however, should not discourage donating blood; the American Red Cross has agreed to determinedly comply with the FDA regulations to prevent events equivalent to those of the Canadian Red Cross from occurring, thus making both donating and receiving blood safer than ever. Needles and bags used to collect blood are used only once and then discarded, literally making spread of infection to the donor impossible. Samples of the donated blood are sent to one of nine Red Cross National Testing Laboratories to be tested for transmissible diseases. In the labs, the blood is separated into its components: red blood cells, platelets and plasma. The products are placed in isolated, temperature-controlled refrigeration divisions until the test results are received (12-18 hours) and lastly, the blood is either released for distribution or destroyed. Respectively remember that a pint of blood may help up to 3 people; there is no alternative for human blood; and every 3 seconds, someone needs a blood transfusion. The process is simple, encouraged for everyone, and irrefutably saves thousands of lives [6].

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Research Necessary for Treating the Negative Symptoms of Schizophrenia

by Esther Reach

Mental illness is a prevalent occurrence across America. Approximately 26.2% of Americans over the age of 18 suffer from a mental illness [2]. Among the many different forms of mental illnesses, schizophrenia may be the one most frequently overlooked and misunderstood. Schizophrenia is a disorder in the brain that affects an array of functional characteristics. These include memory, attention, executive function, and working memory [3]. Since these specific functions are necessary for normal living, there has been a greater emphasis on developing pills to correct these flaws.

There is a wide variety of symptoms for schizophrenia. A schizophrenic may be withdrawn, find it hard to know what is real and what is not, and have trouble expressing their emotions in social circumstances [4]. Symptoms, of course, are not limited to these previously mentioned - they often differ between different sufferers. The symptoms observed in schizophrenics can be further distinguished into two different groups - positive and negative symptoms. Positive symptoms are defined as symptoms that are additions to the person's personality while the negative symptoms are that which take away from the person's personality [4]. For example, delusions and hallucinations are considered positive symptoms because they are qualities that are added to the patient. Social withdrawal and lack of drive are considered negative symptoms because they take something away from the patient [4].

It is believed that schizophrenia is caused by both genetics and environmental influences. It has also been shown that anyone may get this mental illness - it is not exclusive to age, sex, or race [5]. Though schizophrenia is not specific to a certain type of people, there is one common ground amongst those who suffer. This common ground can be found in the brain. Sufferers of schizophrenia have a chemical imbalance in this organ [4].

Fortunately, though schizophrenia is a serious mental disorder, treatments exist to help those with the illness cope with their problems. Among the different ways of treating schizophrenia is medication. There have been great strides in this field of research. However, some experts believe that most of the treatments focus too much on positive symptoms and not enough on negative symptoms. Marder of UCLA writes that "Although effective medications for managing the positive symptoms of schizophrenia have permitted many patients to live in the community, these medications often fail to improve social and vocational function. As a result, some experts believe that research into new treatments should focus instead on the functional outcomes of patients by improving cognitive abilities and social competence." [6] Though schizophrenics may be able to live in communities after treatment, it may not mean that they can deal with others. Living in communities could mean that they can live without disturbing the general public. They still may not know how to interact with others and continue to live isolated lives. This is why experts say that treatments should take bigger strides towards treating negative symptoms because the illness will only persist if they are not treated.

Research has been conducted on the link between cognitive function and schizophrenia with the effects of antipsychotic medication. There are two types of medication: conventional and atypical. Research shows that atypical antipsychotic monotherapy can help reduce the effects of schizophrenia [3]. Atypical, as compared with conventional medication, focuses not only on positive symptoms, but also the negative symptoms [4], allowing a greater range of improvements. In an experiment conducted on the relationship between cognition and the illness, the patients were divided up into two groups, differing in the type of medication they received, conventional or atypical. The experiment showed that the group using the atypical medicine attested a greater performance in visual memory, delayed recall, and executive function [3]. With the use of atypical antipsychotic medication, cognition can be improved in schizophrenia patients.

The improvement in cognitive function through the use of medication in schizophrenic patients has been an important breakthrough. There are now initiatives being taken in research of this area. Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) is one of the many endeavors in researching further uses of drugs for schizophrenia [7]. With research showing a great progress in maintaining the mental illness, there can be hope for its prevention.

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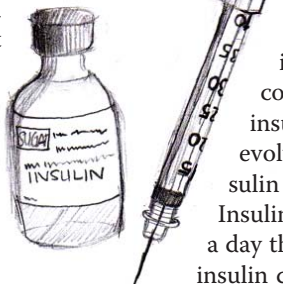
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Novel Treatments for Diabetes

by Aarti Sharma

Diabetes has a patchy history tracing back to the third Egyptian dynasty, but was usually regarded as a low-priority affliction, the progress towards its treatment as imperceptible as the prevalence of the disease itself. However, in recent years, the word 'diabetes' in modern society and medical circles has attained an infamy comparable to that of cancer, AIDS, and heart disease due to its almost epidemic 50% increase in the last decade. Fortunately, thanks to unrelentless research and creative potential put forward by scientists, engineers, and nutritionists unfazed by lack of current federal funding, the invention of new treatments and technology to counteract this disease have, at least, in part, managed to match the alacrity at which it has increased.



Drawn by Robin Zhou

Crudely stated, diabetes is characterized by chronic elevated blood sugar levels due to either lack of response to (Type II) or inability to produce (Type I and/or II) the hormone insulin, which facilitates the uptake of glucose from the bloodstream into most body tissues. In order to rectify these conditions, patients with Type I (a.k.a. insulin-dependent) diabetes traditionally hypodermically inject themselves with an artificial form of recombinant insulin. Type II diabetics have traditionally attempted to control their blood sugar levels through changes in diet, exercise, weight loss, and also through ingestion of oral antidiabetic drugs. Patients with either type are expected to closely monitor their blood sugar with customary finger pricks every 3-4 hours, depending on the sensitivity of their condition. [1]

The first significant treatment that has gained credibility in the recent past is an inhaled version of insulin. Instead of being subcutaneously injected, the insulin is delivered via nasal aerosol followed by absorption by and dispersal by way of the lungs. This method of delivery has been proved to have the same therapeutic effectiveness as traditionally injected insulin. Also, the level of discomfort associated with the inhalation process in comparison with that of shots is considerably less – this is where the main appeal of the product lies. Injections, in addition to being cumbersome in both process and material, are reasonably painful; inhalation, on the other hand, requires much fewer modules and presents almost no discomfort to the patient. However, like any other revolutionary treatment, long-term effects on the holistic body are still awaiting quantification, and other factors like financial stipulations must still be discussed before the onset of large-scale marketing. [2]

Another interesting new development is the Glucowatch®. This was created primarily to alleviate the acute inconvenience and pain that accompanied the process of finger-pricking to monitor diabetic blood sugar. The Glucowatch, which is precisely what it sounds like – a device strapped onto the wrist that provides a noninvasive measurement of blood sugar by extraction of glucose through intact skin, is designed to take readings every ten minutes and give alarms when sugar levels are too extreme. [4] However, although this gadget was invented to assuage the burden of tradi-

tional glucose monitoring, it is not intended to completely replace it; in other words, it should be used primarily as a supplemental indicator.

A third, and perhaps essentially the most important, novel gadget for diabetics includes the newly FDA-approved Minimed Paradigm pump. The 'insulin pump' itself was conceptualized and developed in the 1960's – originally created to 'alleviate' the inconveniences associated with conventional methods of insulin delivery. However, its purpose has significantly evolved – it is now hoped to almost exactly imitate the insulin producing beta cells of a functional human pancreas. Insulin pumps deliver rapid- or short-acting insulin 24 hours a day through a catheter placed under the skin. The types of insulin doses include 1.) 'boluses' after meals and high blood glucose readings and 2.) a 'basal' rate, which continuously 'pumps' a specific amount of insulin. Despite the technology, however, manual programming and calculation of dosages was still required. Enter the new phenomenon of the Paradigm 712 pump: this device almost eliminates any need for human manipulation. This has been accomplished through incorporation of a glucose monitoring system and BolusWizard® calculator within the pump itself, which calculates recommended dosages for the patient based on the carbohydrate content of the meal, amount of insulin still active in the body, and level of blood sugar. "This provides additional flexibility to patients whose bodies may be sensitive to the effects of insulin." [4]

These new technological and medical advances are groundbreaking for the reasons that they significantly alleviate the inconveniences and discomfort associated with traditional methods of supervising diabetes, while simultaneously providing more sensitive ways of actually treating it. If the rapidity at which these treatments are materializing are any indication of the efficiency of diabetes research, perhaps a cure for this epidemic is not completely unforeseeable.

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An Alternative Method for Stem Cell Production: A More Ethical Approach?

by Katrina Cruz

Stem cell research has the potential to cure a sizable range of diseases common to humans. However, some feel that the current methods it employs violate not only their personal code of ethics, but also certain human rights. For this reason, stem cell research remains one of the leading controversies in science. Though the scientific and religious communities make up the two main opposing sides of the debate, the decisions made about policies on stem cell research concerns most people and involves everyone across the globe. As a result, many attempts have been made to find alternative methods of conducting stem cell research. Many possible "ethical" solutions have been formulated, all of which continue to be debated on. Researchers now show that a procedure based on one of the proposals (the Morula Proposal) can be carried out not only in animals, but in humans as well. It is up to individuals to decide whether this solution meets their ethical standards.

Of the three types of stem cells (embryonic, adult, and umbilical), embryonic stem cells are especially important because of their capability of growing into almost any tissue [4 FIX]. This means they could be grown into replacement organs for people with diseases such as diabetes and Parkinson's [3 FIX]. Despite its prospective medical contributions, many oppose research on stem cells for fear that it breaks a code of ethics. Some religious groups, including many Christians, consider today's method of stem cell research to be unethical for it involves the killing of humans in the form of embryos (especially for the purpose of mere scientific gain). In a Christian point of view, an egg that is fertilized, and becomes a human embryo, is considered to be a living being that is to be treated according to Christian ethics (which does not include the murder of other human beings). Hence, Christians believe that the destruction of human embryos is equivalent to the murder of a person that is already born. Some human rights activists also fear that stem cell research might entail unethical experimentation on humans.

Today, embryonic stem cell research involves creating stem cells from human embryos, which do get destroyed when they reach their 100-cell (blastocyst) stage after five days of development. In 2001, the U.S. president, George W. Bush, voiced his opposition to research on stem cells by limiting funding to then-existing cell lines [1]. Since the implementation of this policy, the scientific community has become doubly interested in finding alternative methods of creating embryonic stem cell lines.

A few of the main solutions that have been proposed include The Parthenote Proposal, The Morula Proposal, The Organ Transplant Proposal, and The Alternate Nuclear Transfer (ANT) Proposal [2]. While these proposals sound promising, the viability of some these methods in humans have yet to be proven. Advanced Cell Technology, Inc. of Alameda, Calif, known for cloning a short-lived human embryo in 2001 and for playing a prominent role in the field of stem cell research, announced in August that they have successfully carried out in humans one of the four alternative methods

[1]. Until the recent breakthrough, the Morula Proposal had only been proven viable in mice. This proven method is based on a fertility clinic procedure, pre-implantation genetic diagnosis (PGD), in which the genes of a single cell (blastomere) extracted from an embryo is analyzed for the coding for diseases. Only the healthy embryos are returned to the mother's womb. Similarly, the Morula Proposal suggests a method of creating human stem cells by taking only a single cell from an embryo. The difference is that the embryo from which the blastomere is taken has developed only up to the early 8-10 cell stage, called a morula. The single cell extracted from the embryo is then made to divide so that it can then be used for creating stem cells [2].

Unlike in the current methods of creating stem cell lines, instead of using a whole embryo for growing stem cells, thus completely eliminating its potential to grow into a normal human being, an embryo (now one cell incomplete) is implanted in the womb, where it continues to divide as normal and grow into a normal human. According to researchers, around 1,500 of these embryos have matured into seemingly healthy babies across the U.S. [1]. This soothes concerns about whether children that grow from these types of embryos might develop health problems in the future. However, one could still see this method as unethical when one considers that the single cell obtained could potentially grow into an embryo itself when implanted back into the womb [2].

Skeptics outnumber supporters, though White House spokeswoman, Emily Lawrimore, has voiced (in a prepared statement) that researchers are moving in the right direction [1]. It appears that any breakthrough, every step made towards proving the functioning of the four proposals aforementioned might bring all who are concerned with stem cell research closer than ever to reaching a compromise.

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One Body, Two Skeletons

by Simrata Bamrah

Many people believe in the myth of unused muscle turning into fat, but the actual concern for a select few is the transformation of body parts into bone. The disease Fibrodysplasia Ossificans Progressiva characterizes the abnormal transformation of soft connective tissue into bone. Just imagine what would happen if the soft, flexible parts of your body became rigid and stiff.

The disease is formally called Fibrodysplasia Ossificans Progressiva and FOP for short. As the name would imply it involves a progressive transformation of soft connective tissues, such as tendons, ligaments, joints and skeletal muscle into bone [1]. In a normal body, bones come together at joints, which allow for movement and mobility of the human body with the assistance of the other soft tissues. Since these structures are changed into bone, they no longer could perform their functions; therefore, FOP's major attribute is impairing mobility. The bone formed is not any different from the normal bone, but its formation is strange in its location and timing [1]. There is no set standard to how this disease proceeds and the pace is unpredictable.

In general, a person with FOP would seem quite normal, but the signs of FOP could first be seen at birth. The most common indicator of FOP for a newborn is significantly big toes. [2]. Over the next twenty years of their life, through a process called heterotopy ossification fibrous, nodules on the neck, back and shoulders may develop [1]. As the disease continues to progress more and more of the body's soft tissues ossify.

The effects of the disease follow a general pattern of occurrences. It strikes the upper body foremost by deforming the soft tissue of the back and shoulder area. It then proceeds in vandalizing the lower part of the body by impairing the hips and knees [1]. More specifically it could cause locking of the jaw and other body parts, causing malfunction.

Along with the rate of progression being unpredictable, this disease is quite unique to each case as to when bone may generate. The process of the bone generation is referred to as a flare-up. A flare-up could be triggered by dramatic trauma or even the simplest offsets. For instance, it is just as possible that falling with great force onto the ground is as likely as an injection by a needle is to offset new bone formation [2]. Also, the occurrences of new bone development may be dormant at some times and then active at other times as a result for the same type of trauma [1]. The reasoning for this is unclear.

The bones themselves do not seem to cause pain to the patients, but it is this process that does. It causes the tissues to swell and thus creating discomfort or even a fever to develop. Medication could be prescribed for these side effects, but there is no treatment for FOP itself [1]. One may reason that a treatment

for the disease itself is to remove the excess bone as it forms; however this would only make the situation worst. This procedure would cause agitation, and in turn the regeneration of even more bone [1,2].

Finding the roots of FOP had been difficult for many scientists because it deals with a mutation of a single gene out of the entire genome. The disease was found to be an autonomic dominant disorder [3]. It took a while before scientists could figure it was hereditary because the disease significantly lowers the reproductive fitness of FOP patients, hence indicating that sufferers of FOP usually do not have offspring [3]. The main pioneer of the discovery was Frederick Kaplan. He was able to specifically determine that the genetic mutation causes an overproduction of bone morphogenic protein-4, which is abbreviated BMP-4 [4]. Perhaps with further studies scientist will be able to manipulate this gene to correct the abnormal characteristic of FOP. This discovery allowed scientists to pinpoint the gene that correlates with bone production in general, and will help with other diseases of the bone, such as osteoporosis [2].

Fibrodysplasia Ossificans Progressiva is a rare disease that affects the normal body tissue of a person by changing it into bone. This change in structure creates a second skeleton that may encage a person's normal skeleton. This restricts or even inhibits the mobility of those affected. As a result it creates a huge strain on a patient's life because it only gets progressively worse as there is no treatment or cure. Research has taken a positive turn to isolate the source of the disease. It is a single gene out of a billion that calls for the overproduction of a bone morphogenic protein. This discovery will now allow scientists to find a way to change the path of new bone formation and help with treating other bone diseases.

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Aromatherapy to Decrease Perception of Size

by Amy Ye

Nutritionists, dieticians, and health experts recommend having a balanced intake of grains, vegetables, fruits, dairy, protein, and fats. These are allocated on the basic food pyramid which also highlights the number of servings per food group that the average person should intake [1]. The amount of energy in food is measured by calories (1000 calories or 1 kilocalorie). While the average person requires only 1,200 to 2,000 calories per day, the average American adult eats around 2,000 to 3,600 calories per day. To contribute more to the obesity factor that has swept across America, over 50% of these calories are from fats and simple carbohydrates [1]. Contributing to this epidemic, Americans have shown a decline in physical activity. Body mass index (BMI), determined by dividing the mass of the person in kilograms by the height of the person in meters squared (kg/m^2), provides approximate estimates of weight categories. Persons with BMI's under 18.5 are underweight, persons with BMI's from 18.5 to 25 are of normal weight, persons with BMI's from 25 to 30 are overweight, and persons with BMI's above 30 are obese [1]. From 1986 to 2002, demographic studies noted a 2.4 and 1.82 increases of BMI units in women and men respectively [2]. The average BMI for females and males in 2002 were 25.7 and 26.8 respectively [1]. To compensate for the growing size of the average American individual, diets have been created to "help" one reach the ideal figure of a New York runaway model. However, with knowledge of the olfactory sensory system and the brain, researchers have been able to develop alternatives to diets.

As America enters into the twenty-first century as an obese country, media portrays models with stick-thin figures, defined as the current trend and style. To compensate for the discrepancy between the actual weight of an average American and the size of the building modeling industry, more and more have turned to some sort of diet to reach to the size of the svelte. Scientists specialized in olfactory have developed short term solutions that will allow one to look great, and improve their lifestyle overtime rather than using crash diets to meet certain expectations, which is detrimental to one's health [2, 3].

According to a study performed by Dr. Alan R. Hirsch, Jennifer R. Hoogeveen, Anne M. Busse and Elizabeth T. Allen, a floral-spice odor was proven to make women appear thinner. The smell was tested on a five feet nine inches, 245-pound woman. After 199 males estimated her weight, calculations showed that men perceived the woman to weigh at most twelve pounds lighter than how they saw her without being influenced by any odor [3, 4]. In the study, a woman of five feet nine inches and 245-pounds was used as the model and 199 men, ages 12 to 61 were gathered to estimate the weight of the model based upon the different odor smelled. Three different odors were assessed: citrus-floral, sweet pea and lily of the valley and floral-spice.

Tests were performed indoors and the distance between the model and the men were far apart so that the model could not see what the estimations were, and close enough so that people with normal odor detection abilities could perceive the odor. Along with having to estimate the woman's weight, subjects also had to identify if the smell was hedonically positive or not [4].

Results showed that there was a major decrease in perception of the model's weight with the floral-spice odor than with no odor or other smells. The subjects' views of the model's weight decreased as much as twelve pounds lighter than they originally thought her to be without the presence of odors. Statistically, this was a 7% decrease in the estimated weight with the floral-spice odor when compared with estimations without odor [4].

Based upon this study, odors do have an impact upon the way humans perceive each other. This conclusion will be useful to further studies about the impact of smell and appearance. When models in future studies can feel better about themselves, their appearances change also. While aromatherapy may serve as a short-term solution to boost self-esteem and to lower the appearance of one's size, a healthy life-style is of more importance, and is better in the long run [3, 4].

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Social Anxiety Disorder

by Nooreen Ibrahim

Feeling shy or anxious in a social situation is a common feeling for many people. Going on a first date, meeting new people, facing change, going on an interview can make anyone feel shy or anxious. Most people only initially feel this way, until the feel-



ing passes and they can go on with their lives normally. However, there are people that cannot continue on with a normal life. Their anxiety is taken to a heightened level. People who cannot overcome that initial feeling of anxiety, and get so anxious about social situations that it begins to interrupt ones life have Social Anxiety Disorder.

Social Anxiety Disorder is an excessive, constant fear of social or performance situations in which embarrassment can occur. This disorder is the third most common psychiatric disorder. Social Anxiety Disorder is not very widely known, and because of this it is not diagnosed as readily as it should be and accurate treatment for Social Anxiety Disorder is not yet available. Treatment consists of a trial and error process when it comes to taking medication. Anxiety, heart rate speeding up, blushing, trembling, difficulty speaking, stomachache, and ones mind going blank are among the many physical symptoms of the relatively unknown disorder [2]. Some signs of Social Anxiety Disorder are an extreme fear of a situation in which you have to meet new people or others may scrutinize you and the feared social situations are experienced with intense anxiety or avoided entirely [1].

Social Anxiety Disorder usually begins in childhood, or around the ages of 14 and 16. However the disorder can also begin later or earlier than these ages (When the disorder doesn't surface until after the age of 14 and 16 it is usually due to a severely embarrassing or anxious social situation). This disorder usually stays with a person throughout life and affects about 15 million Americans adults.

Understanding how Social Anxiety Disorder works is a key role in to trying to find a treatment for it. What researchers understand so far is that failure of neurotransmitter function in the brain plays a key role in Social Anxiety Disorder. There are three main neurotransmitters that cause Social Anxiety Disorder, which are dopamine, serotonin, and GABA. The degree of which each affects the disorder varies with the individual.

Dopamine has many functions in the brain, the main one being of motor functions. Shortage of dopamine in ones brain can lead to Parkinson's Disease (which is caused by low levels of dopamine), a disease in which one slowly loses motor ability. People with So-

cial Phobia have a 5 time greater risk of developing Parkinson's Disease later in life [2].

Scientists are making an effort to understand how the brain affects Social Anxiety Disorder. Using brain imaging technology and neurochemical techniques scientists have found out that amygdala and the hippocampus play a major role in anxiety disorders [3]. The amygdala is the part of the brain that alerts the rest of the brain that a threat is present and can generate a fear or anxiety response. The hippocampus makes threatening events into memories. These are the few connects that have been observed thus far by scientists.

Using the knowledge that is available to them so far, scientists have come up with some treatments. The treatment that involves no drugs at all is the psychological treatment. They consist of Cognitive Behavioral Therapy and Cognitive Group Behavior Therapy. These therapy groups are available at University Clinics or Health Centers. There are many medical treatments for Social Anxiety Disorder, however the treatments vary individual to individual. There are many antidepressants such as SSRI, Effexor (this is a serotonin and norepinephrine reuptake inhibitor), moclobomide and MAOI (this is the most powerful and effective antidepressant for social phobia) [2]. Benzodiazepines are also available which consist of Klonopin, and Xanax (works well with women) [1]. Benzodiazepines are the fastest acting and best-tolerated drugs used for the acute use of Social Anxiety Disorder. Side effects of long term Benzodiazepine use are the depression may be aggravated, reduces mental sharpness and reduces motivation. These are just some of the many drugs available for treatment. Treatment may consist of therapy and medication for some people or just medication for others. The person with the anxiety disorder and their attending physician decides the treatment.

The life of a person with Social Anxiety Disorder can be very difficult; however with treatment life can be made a little better for these people. Unfortunately there is no treatment that works all the time for everyone. People with Social Anxiety Disorder will have to make the best of what is available to them at the moment, and hopefully in the near future there will be more discoveries about Social Anxiety Disorder that will be able to help the millions of people that suffer from the condition.

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Robot-Assisted Surgery: New Age of Healthcare

by Vinay Soni

The advances in technology have evidently changed many aspects of our lives, such as our work, education, and even the way we contact others; but one might ask, how have technology helped our healthcare system? Before the dawn of technology, mostly everything was done by hand, but with the introduction of robotics, we see a difference in our lives, for the better. This is no different in surgery. Surgeons mostly operate using manual tools and their own hands, but with the introduction of complex cases, more precision is needed to ensure the success of the surgery, and the safety of the patient and the doctors: this is where technology comes in. Robotics, along with artificial intelligence, has provided society capabilities that we sometimes wish we could do, but as with every other benefit, there are some drawbacks to the use of robots in surgery.

Before we can start with the pros and cons of robot-assisted surgeries, we must know what kinds of robots exist, and the history of the emergence of these robots. The introduction of robot-assisted surgeries is a recent phenomenon, dating back 20 years, and during this time, this technology has come to vary in its capabilities and purposes [1]. One of the few new robotic surgical techniques emerging during the late 1980s was the minimally invasive surgery (MIS) [1]; MIS is “a procedure in which the surgeon literally ‘minimizes the invasiveness of the surgery’..to reduce the trauma to the surrounding tissues” [2]. While this is just an example of the new technological developments in techniques in healthcare, many more robots or robotic technologies have different purposes as well, varying in involvement in surgeries.

To ensure that the robots are not a burden to the surgeons and the surgery, tradeoffs are created between the autonomy and the role of the robot, resulting in the taxonomy of robots for healthcare; this taxonomy places robots in passive, restricted, and active roles. Robots that are considered to have passive roles, such as the CT scan, are limited in scope, or its involvement is low risk, while those that are considered to have active roles, such as the da Vinci surgical system, are intimately involved with in the procedure and carry high responsibility and risk [1]. To date, the robotic systems that exist, in order of passive to active roles, are: CT scan, CyberKnife, AESOP, RoboDoc, Acrobat, NeuroMate, and the da Vinci system [1]. While these are some of the robots involved in our healthcare, there are more technological advancements occurring today, such as the telepresence or telesurgery, which allows surgeons to see and be involved with surgeries that are far away [2]: a surgeon can even do a surgery in Chicago while in New York! Here we see many different advances that created many different robots for varying use, but before we can say anything about these robots, we need to see the advantages and disadvantages of robots in healthcare.

Robots are wonderful because their capabilities outstretch the capabilities of humans in several factors. According to Camarillo and colleagues, “Robots have a number of advantages over hu-

mans in performing rote manipulation tasks” [1], meaning that they are consistent in their results and it is this consistency that surgeons require to ensure the well-being of all the patients. Not only are robots undeviating, but they are stable and accurate, and can multitask efficiently [1]. For example, the MIS “reduces the occurrence of bacterial infections and blood transfusions,” and decreases the recovery time and pain experienced by the patient [2]. All of these characteristics make robotic surgery efficient and more reliable than surgery completed by humans. One might think that robots should administer surgeries instead, but one must realize that there are some drawbacks with robotics as well.

Although robots are extremely beneficial to any user, they do provide problems for healthcare. Robots are useful in structured environments, such as industry; however, “in surgery the environment is less structured...highlighting some of the weaknesses in current robotic devices, such as substantial loss of force feedback and lack of adaptability” [1]. Robots cannot replace the instinct and adaptive ability of human beings, and because they cannot adapt as well as humans can, they can sometimes become a hindrance to the surgery. Aside from that, the implementation costs are very high as well: one type of system that is highly recommended, the Da Vinci Surgical System, costs \$1 million dollars [2]. Technology also consistently changes, meaning that there is “an intensive learning curve required before a surgeon can operate using the robot-assisted technology” [2]. All in all, robots cannot function as autonomous beings, and therefore cannot do the surgery alone, but the cooperation between humans and technology take healthcare to a new level.

Robot-assisted surgeries are extremely efficient and beneficial for many people due to the symbiotic relationship between the human and technology. In other words, “Surgical robots can then be viewed as ‘extending or enhancing human capabilities’ rather than replacing humans” [1]. In the end, the symbiotic relationship created with robot-assisted surgeries significantly help patients, physicians, and hospitals in the long run; these surgeries will increase in efficiency as technology increases, and the experiences in healthcare will change with the advances in technology.

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Vinay Soni is a first year biological sciences major and plans to attend pharmacy school to become a pharmacologist.

Bionic Limb Technology Continues to Emerge

by Katherine Tuan

Since the first bionic arm was fitted to a man in 2001, bionic limb technology has further emerged as a practical, exciting medical technology for amputees. For many years, amputees have had the option to use simpler prosthetic limbs, which are less functional but maintain a more normal appearance. However, up-and-coming bionic limb technology offers limbs that are controlled by the brain.

Jesse Sullivan is considered the first amputee to have an artificial limb controlled by the brain. In May of 2001, Sullivan suffered serious burns during his work as a utility lineman and had to have both limbs amputated. Seven weeks after the incident, Sullivan met with researchers in Chicago to discuss possible options for restoring limb functions through prosthetics. At this time, Sullivan met Dr. Todd Kuiken, head of the neuroengineering department at the Center for Artificial Limbs at the Rehabilitation Institute of Chicago. Dr. Kuiken developed the special technology, muscle reinnervation, in order to install Sullivan's bionic left arm. For Sullivan, this process involved grafting nerves in his left shoulder that previously went to his arm into his pectoral muscle. When Sullivan wants to move his left arm, an impulse is sent from his brain to the grafts, causing a small contraction in his chest muscle. The contraction is detected by electrodes, which transmit the signal to the arm's computer, signaling motors to move the hand or elbow. While Sullivan has a left bionic arm, his right arm is a simpler prosthetic one, consisting of a hook. Sullivan stated the following on his bionic arm: "When I use the new prosthesis I just do things. I don't have to think about it" [1].

According to Gregory Clark, associate professor of bioengineering and prosthetics researcher at the University of Utah, the usual arm is able to go through twenty-two distinct motions. Sullivan's bionic arm is able to go through four movements, but researchers are working to improve the capabilities of bionic arm movement [1].

On September 14, 2006, the first bionic woman was introduced to the world [2]. Claudia Mitchell, previously an officer in the United States Marine Corps, had to have her arm amputated after a devastating motorcycle accident [2]. After reading about bionic limb technology used with males, Mitchell contacted Dr. Kuiken, the same researcher who developed the technology for Jesse Sullivan [2]. Just as in Sullivan's case, nerves from Mitchell's brain were rerouted from her arm to her chest, and electrodes were implemented to direct her bionic arm [2]. Actual usage of the bionic arm is not immediate, however. After the procedure of rerouting nerves takes place, a patient must wait three to five months for the nerves to grow into their new position, and then the bionic arm can be utilized [3].

Mitchell's bionic arm allows her to eat, get dressed, and pick up items. Her bionic arm employs three motors to perform desired commands. In the future, engineering researchers plan to create a bionic arm that utilizes six motors, so that patients can execute more difficult tasks in a natural manner. Researchers would also like to apply the same methods to creating bionic legs, so that patients can sense where they are walking [3].

Bionic limb technology has even greater implications for use in the near future. Later in 2006, United States soldiers who lost their limbs serving in Iraq and Afghanistan will have the chance to restore arm movement through bionic limb technology. However, this valuable technology does not come at a small price. The cost of Claudia Mitchell's bionic limb was about sixty thousand dollars [2].

Bionic limb technology has not yet become a widespread medical technology, because it is a relatively new, growing area of biomedical research. Those who have had bionic arms fitted are able to perform daily functions using a thought-controlled arm. Only a few years after a bionic limb was fitted to the first man in the world, the same technology has been fitted to a woman. As biomedical technology continues to develop and progress at a rapid pace, amputees will have improved models of prosthetic devices to choose from. Researchers are working to make bionic limb technology more efficient, and to apply the technology to prosthetic leg devices. As the improving technology continues to become more widespread, more amputees will have the option to regain their lives back using bionic limb technology.

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RESEARCH ABSTRACTS

The abstracts that follow were contributed by undergraduate students.

Title: Tissue Factor (TF) expression in primary invasive breast cancer correlates with tumor size and grade but not with outcome

Student Team and Sponsors: V Macias¹, J Geynisman¹, S Frkovic-Grazio², M Bracko², B Susnik³, Y Lu⁴, AA Kajdacsy-Balla¹ and PF Lindholm⁴ ¹Department of Pathology, University of Illinois at Chicago, ²Department of Pathology, Institute of Oncology, Ljubljana, Slovenia, ³Department of Pathology, Medical College of Wisconsin, Milwaukee, WI, and ⁴Department of Pathology, Northwestern University, Chicago, IL 60611

Description:

Tissue factor (TF) and coagulation factor VIIa activate the extrinsic coagulation pathway and protease-activated receptors. These events and direct intracellular signaling induce gene expression regulating cell growth, motility, invasion and angiogenesis. Increased TF tissue levels have been observed in high grade cancers of various sites and have been associated with aggressive behavior of some tumors. The role of TF expression as a prognostic factor in primary breast carcinoma is not known. The aim of this study is to determine whether TF expression in breast tumors is associated with tumor characteristics and survival outcomes in stage 1 breast carcinoma. Immunohistochemistry with anti-TF monoclonal antibody 4509 (American Diagnostica) was performed on formalin-fixed paraffin-embedded tissues arranged into a tissue microarray of 243 subjects with primary invasive breast carcinoma (pT1N0) operated in 1983-87 at the Institute of Oncology, Ljubljana, Slovenia with a median follow-up of 19 years. Scoring took into account intensity and percentage of cells staining in each tissue core. Results showed a range of 0.00 – 2.60 (mean, 1.016; median 1.000); less than 1 = 42 tumors (17.3%); equal to 1 = 136 tumors (56.0%) and greater than 1 = 65 tumors (26.7%). TF expression data was grouped into 2 categories: less than 1 and greater than or equal to 1. TF expression was significantly related to tumor size ($p = 0.004$), histologic type ($p = 0.043$) and histologic grade ($p = 0.033$) by Pearson chi-square test. By Kaplan-Meier univariate analysis, TF expression was not associated with distant metastasis free survival (DMFS) ($p = 0.48$) or cancer specific survival (CSS) ($p = 0.36$). By multivariate analysis, only lymphovascular invasion, mitotic index and histologic type were associated with DMFS and CSS. Although TF expression is related to tumor characteristics (size, grade and histologic type) it does not seem to have a direct prognostic significance in patients with primary stage 1 breast cancer.

Title: Transcription Factor NF-Y-A5-B9-C9 are components of light and hormone signaling machinery in Arabidopsis

Student Team and Sponsor: Julia Adamiak, K Warpeha, J Yeh, S Upadhyay, L Kaufman

Description:

Plants respond to different wavelengths of light and different classes of hormones by initiating various signal transduction mechanisms that are ultimately responsible for higher plant growth and development. While a great deal of progress has been made, full signal transduction chains have not yet been described for most light or hormone mediated events. We have elucidated a complete signal transduction chain leading to *Lhcb* gene expression in etiolated Arabidopsis: GCR1 (the sole Arabidopsis protein coding for a potential G-protein coupled receptor), GPA1 (the sole Arabidopsis G-alpha subunit), PRN1 (Pirin1, one of four members of an iron-containing subgroup of the cuprin super family), NF-Y-A5 (an NF-Y-A CCAAT-box binding protein subunit), NF-Y-B9 (LEC1; an NF-Y-B CCAAT-box binding protein subunit) and NF-Y-C9 (an NF-Y-C CCAAT-box binding protein subunit). RT-PCR assays of all A subunits (10), B subunits (10) and C subunits (9) indicate that only A5, B9, and C1, C4 and C9 subunits are expressed in etiolated seedlings. Mutant seed lines of C1 and C4 indicate that these proteins are not likely involved in *Lhcb* transcription. DNA insertion mutants for NF-Y-A5 and NF-Y-B9 indicate these proteins and not other A or B subunit are involved in blue-light-induced *Lhcb* expression. ABA seed germination assays of specific mutants seedlings indicate that both A5 and B9 and possibly C9 play a role in early seedling development. It is an unexpected finding that the signaling mechanism for blue light (NF-Y A5-B6-C9) is the same as the signaling mechanism for the hormone ABA.

Title: Studying a Podospora Het-s Prion in Yeast

Student: Nguwah Tun

Sponsors: Vibha Taneja, Dr. Susan Liebman

Description:

Prions are aggregated, self-propagating and infectious forms of normal proteins. Prions have been described in mammals and fungi. The *het-s*, non-essential gene, from *Podospora anserina* (filamentous fungus) has two alternate alleles: *het-s* and *het-S*. HET-s protein encoded from the small *het-s* allele can spontaneously transform into an insoluble aggregated prion form, [Het-s]. The big HET-S protein, however, is soluble in cytoplasm and never forms a prion. It has been shown in *P. anserina* that when a [Het-s] strain fuses with Het-S strain, the fusion cell dies. This

is called heterokaryon incompatibility. The question that we are trying to address is whether this lethality can be reproduced in yeast, *S. cerevisiae*. If so, we can use the yeast system to understand the molecular basis of the lethality.

Title: The Effects of Urokinase Plasminogen Activator on the Maturation of Bone Marrow Macrophages

Student Team and Sponsor: William Billich, Scott Bryer, Dr. Timothy Koh

Description:

Macrophages are derived from stem cells produced in the bone marrow. When these cells migrate out of the bone, the macrophage precursors become monocytes. The monocytes then circulate in the blood, adhere to the capillary endothelium, and diapedise through the space in between the cells which is associated with their terminal differentiation. The cells then traverse through layers of tissue, a process that may require the expression of proteases to degrade the proteins of the extracellular matrix, to gain access to sites of infection or tissue repair. Mice deficient in the proteolytic enzyme, urokinase-type plasminogen activator (uPA^{-/-}), exhibit an attenuated ability to repair muscle tissue correlated with a lack of macrophage accumulation compared to wild type mice. The question remains as to why macrophages do not accumulate in damaged muscle of mice deficient in uPA. Previous studies on myeloid cell lines have shown that exogenous uPA was required for these cells to adhere in vitro. This suggests that our uPA deficient mice may lack macrophage accumulation in damaged muscle because they can not adhere to the capillary endothelium thus preventing their migration.

Title: Behavioral and Neuroendocrine Disturbances Following Social Isolation in Female and Male Prairie Voles

Student Team: Jonathan Huang, Davida Gerena, Narmda Kumar, Maulin Shah, and Raj Ughreja

Sponsors: Angela J. Grippo, PhD, UIC Department of Psychiatry, C. Sue Carter, PhD, UIC Department of Psychiatry

Description:

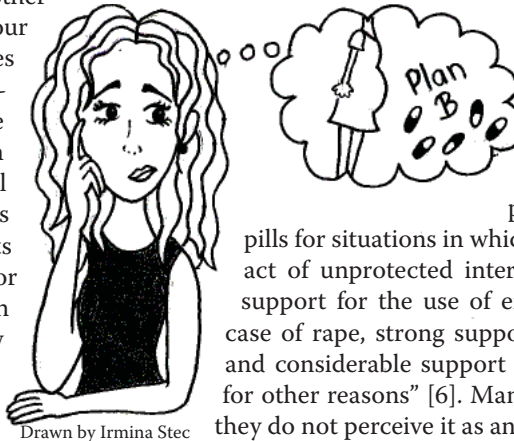
Previous research suggests that mood disorders occur as a result of functions of the neuroendocrine system. The goal of this project was to determine with greater certainty whether the social environment has a direct role in the behavioral and neuroendocrine aspects, related to depression. This may include changes in the normal behavior of the voles and also the presence of hormones in a specific region of the brain. Thus, we have used prairie

voles as a model to simulate responses to social stressors. A series of two experiments were conducted. In the first, the voles were placed in social isolation, after which their blood was sampled and their brains extracted. In order to determine the plasma concentrations of oxytocin, adrenocorticotrophic hormone (ACTH), and corticosterone, two different types of assays were used. In examining the brain tissues, it was fixed, sliced, stained, and mounted on slides. Using immunohistochemistry, we assayed slices of the brain for corticotropin-releasing factor (CRF) and oxytocin. Subsequently, the number of stained CRF or oxytocin cells was counted in the paraventricular nucleus (PVN). In the second experiment, the voles were exposed to the resident-intruder test, after being isolated for 4 weeks. After this occurred, tests similar to those conducted in the first experiment were used to assess the levels of hormones in the plasma and brain tissue. Additionally, the reward-seeking behavior of the voles was recorded throughout the isolation period, using levels of sucrose consumption as an index of anhedonia. Social isolation had several negative effects on the voles. Based on the increased oxytocin levels in the voles, along with the reduction in sucrose consumption which was consistent with former experiments, we can conclude that social isolation leads to behavioral and neuroendocrine dysregulation related to depression.

When Things Don't Go as Planned, There is Always a Plan B

by Irmina Stec

When it comes to life's many lessons, one lesson that all of us have learned by now is that things don't always go as planned. Sometimes, life throws at us unwelcome surprises that are small enough for us to fix or get used to. However, other times, these surprises are not so little and change our lives forever, maybe even for worse. When it comes to preventing unwanted pregnancies, couples today have many options available to them. There is a myriad of contraceptive devices available on the market today, such as condoms, birth control pills, diaphragms, etc. However, these methods of contraception are not fool proof and accidents happen. Furthermore, many women engage in, or are forced to engage in, unprotected sex. Even in such extreme cases, women are happy to know that they have an option. This option is known as the emergency contraceptive pill, the most popular of which is Plan B.



Drawn by Irmina Stec

Plan B, bearing the slogan, “when things don't go as planned,” is only one emergency contraceptive pill popular among women today. Plan B, when taken within 72 hours of intercourse and in accordance to the instructions, has an effectiveness rate of 89%, which declines as the time interval between administering the pill and intercourse increases. Plan B is chosen over its competitors not only for its high effectiveness rate, but also for its mild side effects, which include nausea, abdominal pain, fatigue, headache, and menstrual changes. The pill contains the same hormone, Levonorgestrel, found in many birth control pills, but at a much higher dose. Consequently, it is not meant to be used regularly, but as a safety method after intercourse to prevent a pregnancy [1].

In order to understand how Plan B works, one must first know that fertilization can only occur during ovulation, which, for most women, lasts only from 3 to 5 days a month. However, sperm can reside in the vagina for up to 5 days, waiting for an egg to be released [2]. Thus, Plan B works by either suppressing ovulation, preventing the sperm from coming in contact with the egg, or, if fertilization has already occurred, by preventing the fertilized egg from implanting itself onto the uterus wall [3].

It is this last mechanism of action that has raised a few eyebrows among the Pro-Life community since Plan B's approval by the FDA in 1999 [2]. This past August, the FDA went one step further and approved Plan B for over-the-counter distribution to women 18 years of age and older [4]. Although medical experts cannot agree on whether life begins at fertilization or implantation to the uterus wall, a recent study conducted by Alder, Dye, Kim, Murphy, and Stanford found that, “up to half of women in national polls in the United States believe that human life begins at fertilization. [...] As a result, these women may wish to refrain from using birth control methods that may exhibit a postfertilization

effect, even if the effect were to occur prior to the woman recognizing that she was pregnant” [5]. It is these women's opinion that not allowing the fertilized egg to implant itself onto the uterus wall is like an early abortion.

However, others believe that Plan B is the perfect solution in instances of rape, and defective or nonexistent birth control, among others [2]. A study conducted by Ellertson and Harper in 1995 found that “students more readily gave approval to emergency contraceptive pills for situations in which a woman had less control over the act of unprotected intercourse. They expressed unanimous support for the use of emergency contraceptive pills in the case of rape, strong support in the case of a broken condom and considerable support in cases of unprotected intercourse for other reasons” [6]. Many people approve of Plan B because they do not perceive it as an abortion, seeing as it does not harm a fertilized egg that has already been implanted onto the uterus wall. However, past research indicates that Plan B, among other emergency contraceptives, is oftentimes mistaken for RU-486 (or Mifepristone), which is an abortifacient, meaning that it does harm an implanted egg by inducing an abortion [2]. Although the clarification of this misconception might persuade women who believe life starts at implantation to try Plan B, it is not enough to sway women who believe life starts at fertilization.

Plan B has been both condemned and hailed by women all over the world. However, as the FDA clearly demonstrated this August, it is here to stay, allowing women to have control of their lives because, as we all know, things don't always go as planned.

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Effects of Malpractice on Healthcare Future

by Alwin Joy

Medical malpractice has always been a way for those in the medical professions to overcome the fear of lawsuits and liabilities from their patients. However, as the lawsuits and claims continued to hike year after year, malpractice costs surged. The direct relationship between increased claims and malpractice costs have caused doctors and medical malpractice insurers to second guess whether or not their profession is worth the amount of effort they place into their jobs. The liabilities that doctors face as a result of their high risk professions might in effect cause a reduction in the number of doctors in certain fields and urban areas of high malpractice premiums. Malpractice, in the long term, might hinder those seeking to be a part of the medical profession from choosing to enter the field, consequently causing a long term reduction in the number of doctors. Doctors should not have to feel hesitant to practice their profession in fear of risk, otherwise they will drawback to a more "defensive mechanism." The National Bureau of Economic Research (NBER) cites that the increased malpractice premiums have caused many physicians to take precautionary action to prevent the risk of lawsuits. Doctors, as a result, have begun to perform a greater number of tests in order to minimize their risk of a lawsuit [1]. As doctors take more precautionary action, I feel that insurers need to reduce their premiums in order to prevent the decline of doctors in the future.

Doctors should be insured when practicing medicine, but with high premiums some doctors have taken the risk of becoming uninsured. The Congressional Budget Office (CBO) states the average premium for physicians in the United States increased fifteen percent between 2000 and 2002, an approximately \$15,000 increase to \$120,000. Areas like OB-GYN saw premiums increase twenty two percent and internists faced the worst with a thirty three percent increase, all the while health care spending per person rose half as fast [2]. Malpractice insurers, though, have seen costs rise as well from \$96,000 in average claims in 1986 to a skyrocketing \$320,000 in 2002 [2]. The direct relationship between malpractice claims and doctors premiums means that patients are also a part of the problem of physicians reconsidering their professions. Thus, one of the resolutions that are being sought in the Senate and House of Representatives is placing a cap on the amount of money that patients are able to claim to \$250,000. The cap is known as non-economic damage caps because the monetary value of the injury or loss of life cannot be quantified to any specific amount [3]. Many see this action as a tort reform because it will help to improve the efficiency of the courts by allowing decisions to be handed faster. A cap will also improve the economy because a fixed claim amount will help insurers and reduce premiums, thus creating a ripple effect throughout the healthcare industry [3]. The CBO states that in 2002 more than forty states already had restrictions on liability claims passed by their legislature that are very

similar to the caps being proposed in the two houses of Congress [2]. I strongly feel that a cap is very important otherwise the extent of the monetary claims will increase exponentially over the course of the years. This rise in claims will have not only a primary effect on the physicians and the insurers but the rise in claims will also have secondary effects on the healthcare industry and the economy as well.

Compensation for negligence is very important for fairness to the patient and because it serves as a tool to ensure physicians uphold a high quality standard of care. Even if the medical malpractice claims serve as a check for the integrity of physicians, in the fairness to the physicians and the insurers, claims of substantially large sums can not continue to be the trend. Patients must realize that there are inherent risks involved in medicine, but also understand that physicians are liable to any harm to the patient. However, physicians should not serve as tickets to a life of luxury and continue to be taken advantage of at their own expense. Patients should not feel concerned about a decrease in physicians because of malpractice insurance costs because regulations will be passed by Congress in the future and many are in place in some states to regulate the escalating claims. Malpractice claims caps have proven to help according to the Office of Technology Assessment. Their studies have shown that states that set limits on their malpractice claims during the 1970s and 80s saw a reduction in the number of claims and premiums for physicians [2]. The CBO even concluded that the HEALTH Act of 2003 would save physicians about twenty five percent on insurance, so many acts are in place and will be in place for physicians to overcome malpractice costs. Another idea that has surfaced in Congress is giving tax credits to physicians to soften the hit to their wallet from malpractice claims. Overall, it seems that the government has spotted the problem and identified solutions to fix the issue, so patients should not panic about a shortage of doctors in the future.

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