

Biologists from Indiana University now suggest that adaptation or natural selection is not as necessary a component to genetic development as previously believed. Non-adaptive processes that have no obvious form of internal regulation such as mutation, recombination and genetic drift, have resulted in the development of essential genetic frameworks, though the relationship remains to be elucidated. The development of successful regulatory mechanisms with no direct phenotypic expression lacks a formal explanation in the time honoured Darwinian adage.

The risk of **radiation induced lung fibrosis (RILF)**, limits the proper dosages of lung cancer radiation therapy that can be safely administered. New findings suggest that the prevalence of RILF is highly correlated with the presence of integrin α -v/ β -6, a primary activator of transforming growth factor (TGF)- β 1, which, in turn, triggers inflammatory and pro-fibrotic effects. The American Society for Therapeutic Radiology and Oncology was recently presented with evidence of dramatically reduced risk of RILF in patients administered with monoclonal antibodies to neutralize integrin α -v/ β -6.



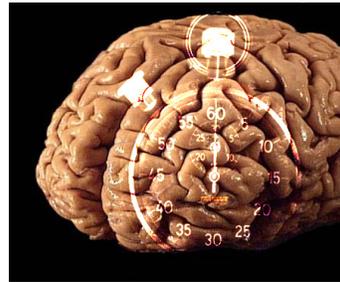
Reactive oxygen species represent some of the most degenerative mutagens created by normal biological mechanisms. The risk of cancer and the concentration of the metabolic byproduct are well documented, and its levels are kept within sustainable levels by manganese superoxide dismutase (SOD2). Examination of pancreatic carcinoma cells revealed that methylation of the sod2 locus results in a lowered concentration of SOD2, though the process is oddly necessary for proper genotypic expression. Molecular consequences of high levels of SOD2 are numerous, first among which are the altered binding capacities of various genes and transcription factors.

A recent clinical study from **New York University** found that activity in the amygdala and the front portion of the anterior cingulate cortex

(ACC) increased when subjects imagined positive events in the future. These structures of the brain are thus highly related to optimistic thinking in humans. The significantly less active ACC in depressed patients further affirms these conclusions; it is foreseen that the results will instigate further research on the fundamental mechanisms of depression.

Researchers from the University of California concluded that smoking an excessive quantity of medicinal cannabis may aggravate symptoms of pain instead of relieving them. Since healthy subjects were used in the study,

experts are concerned that pain perception would be different in patients suffering from chronic diseases. It is expected that these findings will initiate large-scale studies on cannabis use in individuals with cancer and multiple sclerosis, among other diseases.



Researchers at the **Oregon Health & Science University** have identified the gene mechanism by which a kidney protein complex regulates blood pressure in a rare form of hypertension. Similar to the rheostat that modulates the balance of salt and potassium

or her own unique immune system PIN code, making viral information useless in infecting the next individual. This in turn makes it difficult to generalize the entire human immune system and to develop immunological treatments such as vaccines. In future, these new neural networks may be able to more accurately predict the range of known and unknown immune system PIN codes for different individuals.

In **Manchester University**, scientists have found that a herpes simplex virus could be linked to Alzheimer's. The virus, HSV-1, was found to be prevalent in 70 percent of Alzheimer's patients. Those with HSV-1 had an increase in the levels of beta-amyloid protein, a key protein that forms the plaques found in the brains of Alzheimer's patients. The appearance of the virus was

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in the kidney, this proposed "switch" can raise or lower blood pressure. Researchers explain for the first time the key role that multiple WNK kinases play in this process and how they can be manipulated as a functional unit. This finding has significant implications for the elucidation of causes for other common forms of hypertension.

Researchers at the **University of Copenhagen** have created models of neural networks to simulate the role of 'PIN code-like' mechanisms in the immune system defence against disease. This analogy is that every human has his

more common in Alzheimer's patients with a certain mutant gene known as ApoE4. More studies are necessary before the association can be confirmed.

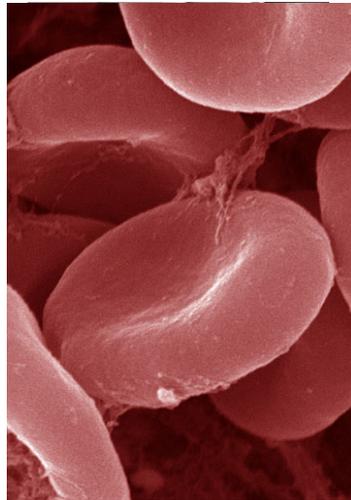
Compiled by the **World Cancer Research**, the largest inquiry on the relation of cancer and



lifestyle reveals that people should aim to be thin to limit their risk of cancer. The research suggests that body fat is a key factor in cancer development, and that people should try to be within the lower portion of the "healthy" weight range. Though two-thirds of cancer situations are not linked to lifestyle, according to the inquiry, living a healthy lifestyle will limit the risks of developing cancer.

A new type of **stem cell isolated from menstrual blood** of healthy females could be used in the treatment of damaged tissue. Cells found in the growth of new blood vessels as part of the uterine phase of the menstrual cycle can be cultured in the laboratory in a shorter time span. This replication rate is far faster than the umbilical cord blood and bone marrow cells currently used. Bone marrow stem cell therapy may be rejected or have limited

A **versatile infant vaccine for meningitis** has shown considerable promise in clinical trials. Current vaccines against A, C, W-135 and Y strains of the disease do not work in children under two years. Developed by Novartis, this conjugate vaccine is better at producing "immune memory" than the older polysaccharide vaccines. The prospect of broader protection against meningitis and septicaemia is encouraging since the greatest burden of these deadly diseases fall upon young children.



The **British Columbia Cancer Agency** has furthered the possibility of tailoring cancer treatments, by using patients' tumor cells and photodynamic therapy (PDT). PDT involves the use of light to trigger anti-cancer drugs in the body, and to stimulate the immune system into fighting cancer. The process involves culturing tumor cells to be sensitive to light, and then injecting the cells into the patient, before using light to provoke cells, the immune system, and anti-cancer drug. Researchers hope that by using the patient's tumor cells, rather than lab cells, the PDT treatment will be more effective.

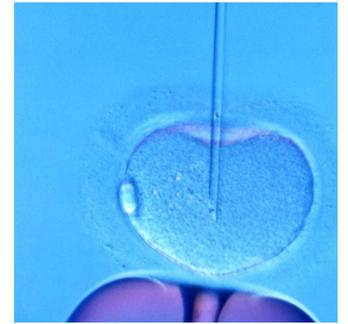
Researchers at **Aberdeen University** have found that mothers who smoke during pregnancy lower the prospective fertility in their unborn sons. After examining 22 fetuses, scientists found that the level of DHH gene, which is crucial to testicle development, was significantly affected if the fetuses' mother smoked more than 10 cigarettes a day. Though more research has to be conducted, this links the effects of smoking during pregnancy directly to future fertility of the unborn child.

Researchers from **Stanford University** have a new blood test that reveals the onset of Alzheimer's two to six years in advance, by identifying 18 key proteins in the blood. The presence of these proteins signifies the higher likelihood of Alzheimer's onset. After testing the blood samples of 259 controls and early blood samples of 47 Alzheimer's patients, the test showed an accuracy rate of 90 percent. With this new test, patients more likely to develop Alzheimer's can be diagnosed and treated earlier.



Two **U.S. pediatricians** have found a new strain of bacteria that causes ear infections in children and, unlike the other strains, is resistant to all prescribed treatments. After

failed treatments, the doctors punctured the eardrum and drained the fluid, resulting in discovery of the strain 19A. Currently, doctors are prescribing Levofloxin, an adult prescription not recommended for children, but effective against strain 19A.



A recent survey conducted by the **British Medical Association (BMA)** showed that approximately 1200 of 2,000 participants approved of a proposal for an opt-out system of organ donation. This system considers everyone as a potential donor unless an objection is registered before death. Adoption of a system of presumed consent would be an underlying strategy to improve the nation's waning organ donor supply. However, the BMA recognizes the considerable controversy behind this suggestion and welcomes opinions on the limitations it places on donor decision-making.

In the brain, **insulin is integral to memory creation** and learning. Neuroscientists at Northwestern University have uncovered the pathological mechanisms of insulin at the synapses. Since the inability to form new memories is an early symptom of Alzheimer's, understanding this insulin-initiated process may be key to decoding possible causes of the disease.

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ability to generate new tissue. Menstrual blood stem cells are a potential strategy to overcome such difficulties.

Researchers from the **University of Sydney** uncover a correlation between cannabis use and enhanced cognitive functioning in patients with schizophrenia. Frequent and recent cannabis use showed significant enhancement of the attention, processing speed and executive functions of neuropsychological performances. These findings suggest that cannabinoid receptors in the brain may have a useful role in the treatment of high-order cognitive processes in schizophrenia.