

## Key genes for ageing indemnified

RESEARCHERS have identified key genes that switch off with ageing, highlighting them as potential targets for anti-ageing therapies.

Researchers at King's College London, in collaboration with the Wellcome Trust Sanger Institute, have identified a group of 'aging' genes that are switched on and off by natural mechanisms called epigenetic factors, influencing the rate of healthy aging and potential longevity.

The study also suggests these epigenetic processes -- that can be caused by external factors such as diet, lifestyle and environment -- are likely to be initiated from an early age and continue through a person's life. The researchers say that the epigenetic changes they have identified could be used as potential 'markers' of biological aging and in the future could be possible targets for anti-aging therapies.

Published April 20 in PLoS Genetics, the study looked at 172 twins aged 32 to 80 from the TwinsUK cohort based at King's College London and St Thomas' Hospital, as part of King's Health Partners Academic Health Sciences



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Centre.

The researchers looked for epigenetic changes in the twins' DNA, and performed epigenome-wide association scans to analyze these changes in relation to chronological age. They identified 490 age related epigenetic changes.

They also analysed DNA modifications in age related traits and found that epigenetic

changes in four genes relate to cholesterol, lung function and maternal longevity.

To try to identify when these epigenetic changes may be triggered, the researchers replicated the study in 44 younger twins, aged 22 to 61, and found that many of the 490 age related epigenetic changes were also present in this younger group. The researchers say

these results suggest that while many age related epigenetic changes happen naturally with age throughout a person's life, a proportion of these changes may be initiated early in life.

Dr Jordana Bell from King's College London, who co-led the study said: 'We found that epigenetic changes associate with age related traits that have previously been used to define

biological age.

'We identified many age-related epigenetic changes, but four seemed to impact the rate of healthy aging and potential longevity and we can use these findings as potential markers of aging. These results can help understand the biological mechanisms underlying healthy aging and age-related disease, and future work will explore how environmental effects can affect these epigenetic changes.'

Dr Panos Deloukas, co-leader of the study from the Wellcome Trust Sanger Institute, said: 'Our study interrogated only a fraction of sites in the genome that carry such epigenetic changes; these initial findings support the need for a more comprehensive scan of epigenetic variation.'

Professor Tim Spector, senior author from King's College London, said: 'This study is the first glimpse of the potential that large twin studies have to find the key genes involved in aging, how they can be modified by lifestyle and start to develop anti-aging therapies. The future will be very exciting for age research.'

Source: Science Daily

## How man became the ruler

Why is it that humans emerged from the natural world, yet we portray ourselves as modifiers of it, even its adversaries?

Paleoanthropologist Rick Potts thinks that fluctuations in the environment in which our ancestors lived were responsible. Our ancestors responded by becoming more versatile through a suite of changes that included an ability to modify our environment. Potts' theory is known as the variability selection hypothesis.

Human ancestors adapted "to novelty and to change itself," he told an audience here at a conference on climate change and human evolution at Lamont-Doherty Earth Observatory yesterday (April 19).

Our species, Homo sapiens, has existed for a mere 200,000 years, but since our line split from that of our closest living relatives, chimpanzees, more than 6 million years ago, global climate has grown increasingly variable, fluctuating between warm and ice-age extremes, but becoming cooler overall.

Our ancestors' East African habitat shifted from forest to savanna, and scientists have long suggested the arrival of the grasslands shaped their evolution.

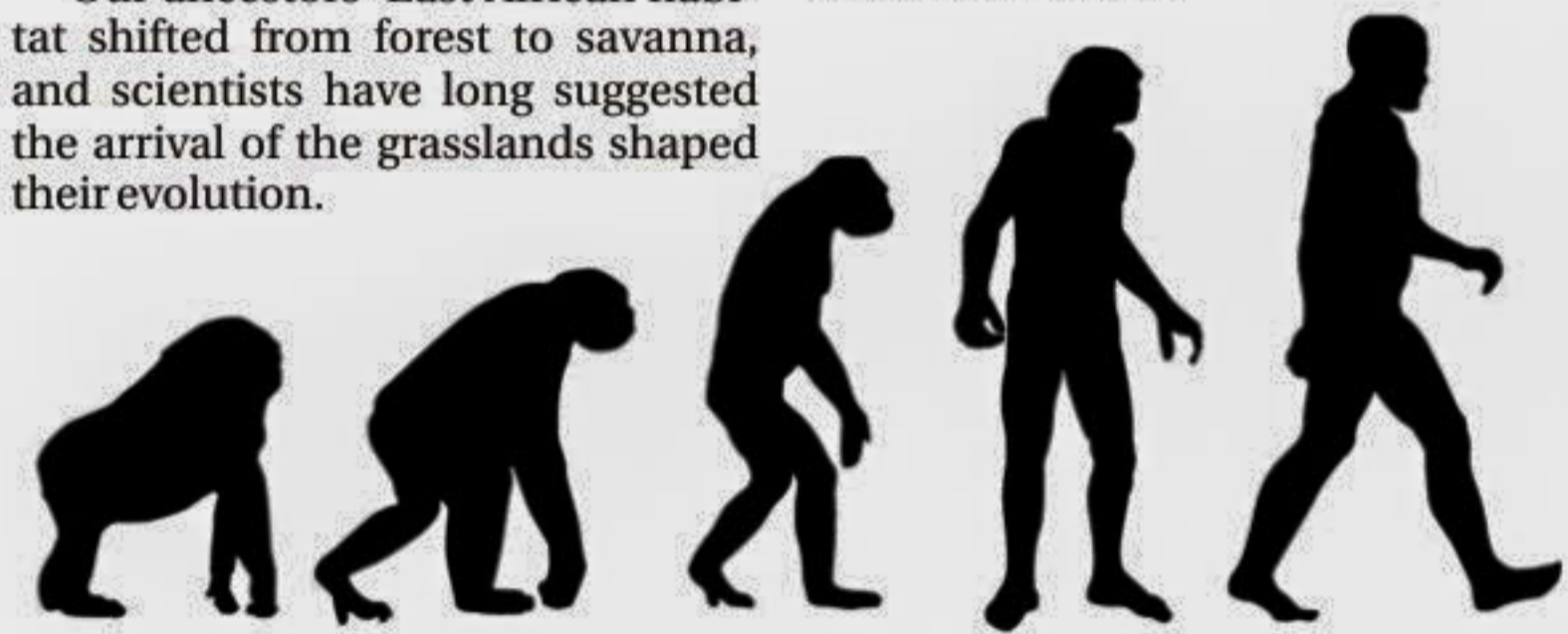
Aside from the savanna, however, it has been only relatively recent that researchers paid much attention to climate and its effects on environment as an evolutionary force, said Potts, who directs the Smithsonian Institution's Human Origins Program.

Researchers have begun examining a number of potential triggers that could have driven human evolution directly or indirectly, including cycles in Earth's orbit and the wobble in its axis, heat, ice ages, changes related to the movement of Earth's tectonic plates, and dramatic fluctuations in lakes, as well as the shift from woodland to savanna.

Potts suggests that cumulatively, these changes in climate and the overall environment pushed our ancestors to evolve distinctly human characteristics.

When faced with extremes, a species has three options, he said: Die out, move to a suitable range, or become more adaptable.

Source Live Science



The ability to walk upright, called bipedalism, is a trait associated with the evolution of humans.



GEBC NEWS



BACK TO NATURE



EMPTY SEARCH

## Biotech club activities



"Biotechnology for better life" a day-long festival organised by GEBC at the Genetic Engineering & Biotechnology Department.

GENETIC Engineering and Biotechnology Club (GEBC) of the University of Dhaka was founded in 2003. From the first year of establishment, GEBC started promotional as well as talent hunting activities. It organized a number of scientific seminars and undertook several outreach programmes at Siddheswari Girls College and Notre Dame College in the years 2004, 2007, 2008 and 2011 to attract higher secondary level students towards Biotechnology. A year-long programme titled "Beyond Life, Through Life; Unveiling the Power of Genes" was organised in association with British Council, Dhaka and ACME laboratories at British Council premises in 2006. On the occasion of 10 years' celebration of the Department of Genetic Engineering & Biotechnology, GEBC invited youngsters from 16 renowned schools and colleges and organized a day-long festival on January 30, 2011 entitled "Biotechnology for better life." Another program titled, "Genetic Engineering and Biotechnology: My Life, My Decision" was organised with the participation of 20 schools and colleges.

GEBC publishes a magazine named, "Biogen" under the financial assistance of BAS (Bangladesh Academy of Sciences). Hitherto GEBC is a pragmatic marker of true biotech movement in our country.

Reported by Mohd. Istiaq Sharif, President, GEBC, Email: sharif.istiaq@gmail.com

## Future is in renewable energy

ZUBAIR HOSSAIN

IF all the types of energy we utilize were converted into crude oil, statistics say, every year the per capita energy consumption would be about 1.5 tonnes. Human development is very closely related to power consumption. Again, the amount of energy consumed has increased with our advancements. Between 1950 and 2000, world energy consumption increased fourfold.

The world is heavily dependant on fossil fuels i.e. oil, natural gas and coal. As they take millions of years to form, fossil fuels are consumed much faster than they are produced. The world's energy reserve is being depleted at an alarming rate and in the future we might run out of all the types of fossil fuel.

In this context, the alternative energy concept is gaining popularity. Historically whenever there was a shortage and subsequent price hike of a dominant energy source, people searched and switched to an alternative. For example, coal replaced wood in the 16th century. Similarly petroleum was first commercialized after Whale oil, the dominant form of fuel for lamps in the early 19th century, was getting beyond affordability of general people. Nowadays various natural phenomena such as sunlight, wind, tides, geothermal heat etc are of much interest because they are freely available in nature. Moreover, these resources are replenished constantly. If appropriate technology can be used, renewable energy can serve as an efficient and sustainable key to development.

**Wind Energy:** In some countries, there are large wind farms consisting of several hundred individual wind turbines which are connected to the electric power transmission network. Wind power is widely used in Europe, Asia, and the United States. No such farms exist in our country,

because here wind is irregular and unpredictable. This is often highly variable at several different timescales: hourly, daily or seasonally. A perfect wind mapping can be a solution. Again, the production can be increased by increasing the height of the wind turbines. It is thought that wind energy can be used to produce 500 to 1000 MW of electricity.

**Solar Energy:** There is a boundless possibility of using solar energy to solve energy crisis of the world. Solar powered electrical generation relies on photovoltaics and heat engines. The initial installation of these facilities is expensive. In addition, setting up of PV cells to produce a sufficient amount of electricity requires a vast open space. Space may not be a problem for our country. And if a good initial investment can be made, the cost of per MW electricity production will gradually come within tolerable limit. Introducing smart grid instead of traditional grid system can make best use of electricity produced from solar energy.

**Biomass:** Biogas comprises primarily of methane and carbon dioxide. The energy released from combustion of methane allows biogas to be used as a fuel. Biogas can be used for cooking, to produce electricity and power motor vehicles. The remnants of the biomass can be used as fertilizer. Besides, the municipal wastes can be burnt to produce energy. One point is to be noted that, in our country paper, plastic and rags are often collected by scavengers. They have high calorific value. On the other hand, food wastes contain a great deal of moisture and not good as fuel.

**Hydropower:** Water being 800 times denser than air, can yield considerable amount of energy even in a slow flowing stream. Although Kaptai Hydroelectric Project serves only 3 percent of the demand at present, establishing hydropower projects elsewhere along with proper water management can make a good contribution to the national grid.



The country's lone hydroelectric plant in Kaptai.

## No dark matter around us?

SCIENTISTS using Earth-based experiments to detect particles of dark matter might now know why they keep coming up empty-handed: There may be no dark matter in the solar neighborhood at least, not within 13,000 light-years, reports a study appearing in an upcoming issue of the Astrophysical Journal.

Though dark matter, a mysterious substance different from ordinary, visible matter, supposedly makes up more than 80 percent of the matter in the universe, the new work suggests that the solar system lives in a dark matter desert. That's a problem, because most scientists think the the Milky Way galaxy is embedded in a large halo of dark matter.

If the results hold, scientists will have to reconsider what sort of shape that dark matter halo takes, although it's unlikely to cause any major cosmological upheavals.

"This doesn't mean that dark matter does not exist," says study coauthor Christian Moni Bidin, an astronomer at the Universidad de Concepcion in Chile. "The result is only that dark matter is not where we expected it."

Dark matter explains many things, including the rotation speed of the Milky Way. Its outer reaches spin more rapidly than expected based on the amount of mass sequestered in visible stars. Scientists have deduced that unseen matter, probably in the form of exotic subatomic particles, engulfs the speeding galaxy, exerting a gravitational force that accounts for the rapid rotation.

Since dark matter is invisible, scientists can't directly observe it in space. Instead, they infer its presence by looking for its gravitational effect on things like stars, gas, and light from distant galaxies. For the new work, a team in Chile went hunting for changes in the paths of stars crossing the sky, sinuous indicators that masses of the dark stuff lay nearby.

More than a year ago, astronomers studied the motion of roughly 400 red giant stars that hovered far above the galactic plane in the vicinity of the solar system. Now, the team in Chile has calculated the amount of matter needed to explain the stars' movements. That total equals the mass of stuff they can see.

Ergo, no dark matter.

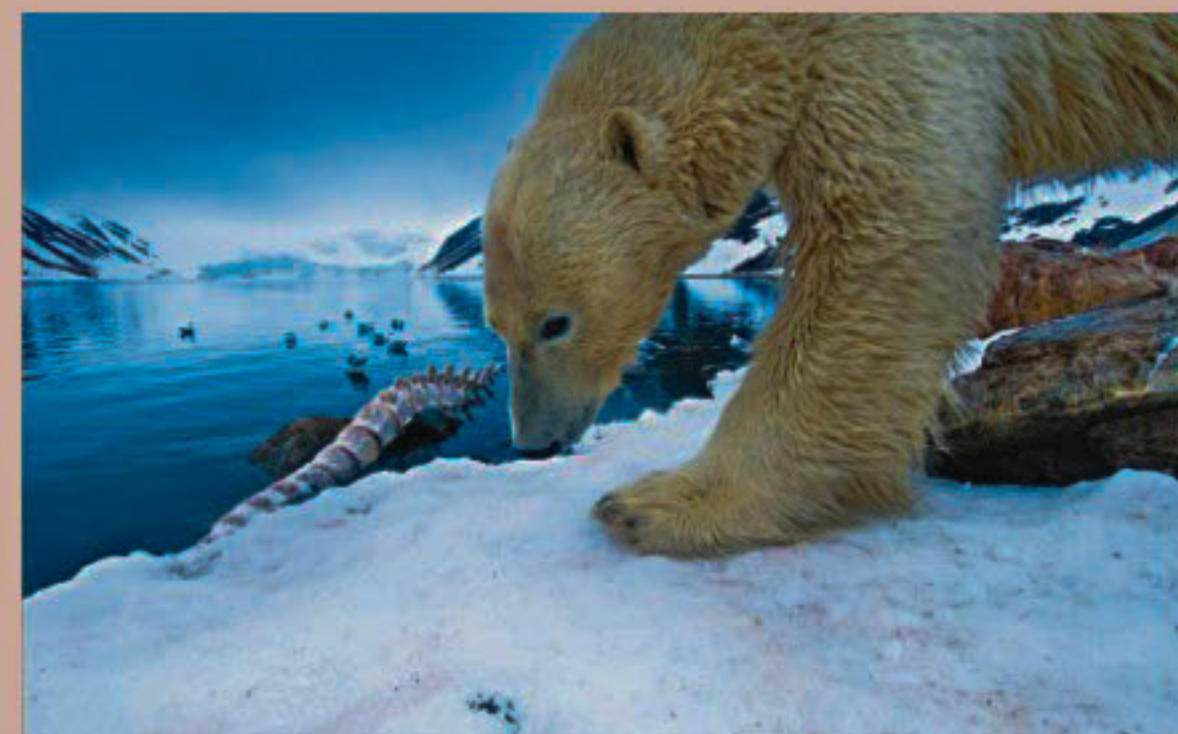
It's a challenging measurement, and one that may not have been done right, says Chris Flynn, an astronomer at Swinburne University of Technology in Melbourne, Australia. When Flynn applied the team's method to a simulated galaxy with known quantities of dark matter and stars, it failed to detect the simulated dark matter. "My best bet is that something has gone astray in the measurements or analysis," says Flynn, a referee of the paper. "I was able to show to my own satisfaction that there was a problem of some kind in the method, but couldn't diagnose where the problem really is."

Source: Science News



A new study suggests that there is no dark matter in the solar neighborhood.

## Dawn of polar bears far earlier than thought



A large male polar bear returns to feed on a fin whale carcass.

Polar bears have been chilling on the ice far longer than is generally thought, new research suggests, and they probably interbred with brown bears at one point after the two species separated.

The new German study contradicts data from a study published last July in the journal Current Biology that suggested polar bears separated from brown bears 150,000 years ago. The new study analyzed the bears' mitochondrial DNA, a special "additional genome" that lives in the cell's energy factories and is passed down only from the mother. The new study concludes that the bears became separate species closer to 600,000 years ago.

## What is the role of salt in human body?



Salt in the human body make us live by activating our brain cells, for good digestion etc. Actually the quantity of salt one should consume in a day is hardly 100mg which we obviously get from the daily meals i.e. from the raw vegetables, fruits, grains and pulses.

We all know that our body is made up of millions of cells. When the intake of salt grows the salt is accumulated on inside and outside the cell. This is similar to a toxic waste. If we drink water more there is a great chance of the salt to drag away from the cell. Hence our sweat is salty.