finds a high degree of overlap between the genomes of all southeast Asians and east Asians, lesser genetic similarity with caucasian populations, and a decreasing genetic diversity from southern to northern China, suggesting that humans entered Asia in a single primary migratory wave.

CHEMISTRY

One-hit wonder

Nature Chem. doi:10.1038/nchem.477 (2009)

Ammonia provides the nitrogen for most synthetic chemicals. But its industrial synthesis from nitrogen gas relies on high temperatures and pressures, and gobbles up fossil fuel.

Building on previous work on splitting the strong nitrogen–nitrogen triple bond, Paul Chirik and his colleagues at Cornell University in Ithaca, New York, have now coaxed nitrogen to react with another abundant gas, carbon monoxide, in one room-temperature step. The reaction forms carbon–carbon and carbon–nitrogen bonds, the backbones of many useful chemicals, and is orchestrated by a compound containing the rare metal hafnium. This compound is not catalytic, so is unlikely to find widespread use. But the reaction's nitrogen-weakening mechanism may inform new ways to assemble complex molecules from simple gases.

PALAEONTOLOGY

Dawn of the anomodonts

Proc. R. Soc. B doi:10.1098/rspb.2009.0883 (2009)

The anomodonts were mammal-like reptiles that were widespread from 270 million years ago until at least 200 million years ago. A new specimen of an animal called *Biseridens qilianicus* has recently been unearthed in Gansu, China. The specimen is in such good shape (pictured, below) that Jun Liu of the Chinese Academy of Sciences in Beijing and his colleagues were able to confirm an earlier hunch that this animal is a very early anomodont. In fact, it is the most basal anomodont yet found, meaning that it is a member of the oldest branch on the anomodont family tree.

This analysis supports the idea that anomodonts originated on the old northern continent of Laurasia rather than on its southern counterpart, Gondwana, as previously thought.

PSYCHOLOGY

Personality versus mood

Arch. Gen. Psychiatry **66,** 1322–1330 (2009)

The antidepressant paroxetine doesn't just make people happier, it alters their personality as well.

Tony Tang at Northwestern University in Evanston, Illinois, and his colleagues studied changes in neuroticism and extraversion — two personality traits linked to depression and the neurotransmitter serotonin — in 240 patients in a 16-week trial with a one-year follow-up. Half of the patients received paroxetine, one quarter a placebo and one quarter cognitive therapy.

Placebo patients improved their depression scores but reported little change in personality. By contrast, patients on paroxetine reported a decrease in neuroticism and an increase in extraversion, even after the results were normalized for differences in depression improvement. Those with the greatest declines in neuroticism also showed lower relapse rates.

Rather than being a mere by-product of improved mood, these personality changes may help explain why drugs such as paroxetine work against depression in the first place.

EPIDEMIOLOGY

Malaria's mark

Science **326,** 1546–1549 (2009)

The deadliest of the four human malaria parasites, *Plasmodium falciparum*, has left its imprint on the human genome in the form of malaria-protective mutations, including those that cause sickle-cell anaemia. Now, Lluis Quintana-Murci and Anavaj Sakuntabhai at the Pasteur Institute in Paris and their colleagues show that — in a similar trade-off — pressure from a neglected strain, *P. vivax*, may maintain a common enzyme deficiency in southeast Asia that can cause jaundice and anaemia.

The team found that the local gene variant associated with the enzyme deficiency was also associated with a 30–60% reduction in parasite density of *P. vivax* but not *P. falciparum*. People with two copies of the gene had the lowest parasite densities. The results suggest that *P. vivax* has had a larger effect on the human genome than previously thought.

Correction

The Research Highlight 'Rude awakening' (*Nature* **462,** 547; 2009) incorrectly described the green parts of the image. The figure shows an expression pattern of green fluorescent protein (GFP) in fruitfly brains, which overlaps with expression of dopamine receptors.

JOURNAL CLUB

Reuben Shaw
The Salk Institute for Biological Studies, La Jolla, California

A cancer researcher ponders a fundamental connection between nutrients and gene expression.

Nutrient availability to single-celled organisms varies according to their environment, and proteins in the cell that sense nutrient levels alter gene expression to increase uptake and use of specific metabolites to fuel cellular processes. Conversely, most cells in multicellular organisms are exposed to constant nutrient levels by the bloodstream, and so far there are few examples of metabolism being directly coupled to the control of gene expression.

A recent paper by Craig Thompson and his colleagues at the University of Pennsylvania in Philadelphia uncovers a direct connection between a well-known metabolic enzyme — ATP citrate lyase (ACL) — and changes in gene expression (K. E. Wellen *et al. Science* **324,** 1076–1080; 2009). Through a chain of reactions, ACL influences the functioning of the histones, proteins that package lengths of DNA — and unpackage them for 'reading'. This means that there is a basic — and surprising — relationship between cell glucose levels and gene expression.

We don't yet know how metabolic challenges — for example, fasting — in whole organisms affect ACL levels or activity. But we do know that some of the same proteins that increase tumour growth also modify ACL by attaching phosphorus.

It is likely that we are just at the tip of the iceberg in terms of our understanding of the molecular basis of how metabolic inputs dictate gene-expression changes in mammalian cells. Future studies using genetic models of ACL loss in distinct mouse tissues, as well as chemical inhibitors of the enzyme, will help to elucidate in which contexts it is critical for gene-expression changes in the whole organism. Moreover, our knowledge of this metabolic linchpin may provide a therapeutic window for the treatment of certain forms of cancer, almost all of which undergo metabolic adaptation.

Discuss this paper at **http://blogs.nature.com/nature/journalclub**