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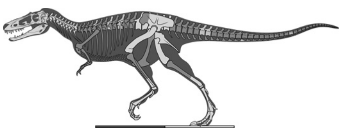
GEOLOGY, EVOLUTION

Long-snouted, many-horned tyrannosaurid discovered

Tyrannosaurus rex, along with its kin among the Tyrannosauridae, possesses a distinct body plan that includes a deep skull, peg-like teeth, and a robust jaw. In recent years, however, researchers have debated whether a different dinosaur, called *Alioramus remotus*, might also be a tyrannosaurid. Stephen Brusatte et al. used bones recently characterized from a small, long-snouted, multihorned carnivore unearthed in Mongolia to support the theory that this dinosaur, called *Alioramus altai*, and *A. remotus*, fall within the tyrannosaurid clade. The authors examined a nearly complete *A. altai* skeleton, including a well-preserved skull, pelvis, and parts of the hind limbs, and compared its features with other tyrannosaurid dinosaurs. The authors estimate that the *A. altai* dinosaur, which had a long snout and at least eight discrete horns, was nine years old when it died and would have weighed approximately half as much as a *Tyrannosaurus* of similar age. Other features of the fossil jaw and teeth indicated that the miniature *T. rex* had a different feeding style than other late Cretaceous tyrannosaurids, feeding on smaller prey. The study increases the range of morphological diversity in one of the most familiar extinct dinosaur clades, according to the authors. — B.A.



Skeletal reconstruction of *Alioramus altai*.

"A long-snouted, multihorned tyrannosaurid from the Late Cretaceous of Mongolia" by Stephen L. Brusatte, Thomas D. Carr, Gregory M. Erickson, Gabe S. Bever, and Mark A. Norell (see pages 17261–17266)

PSYCHOLOGICAL AND COGNITIVE SCIENCES

From the mouths of babes

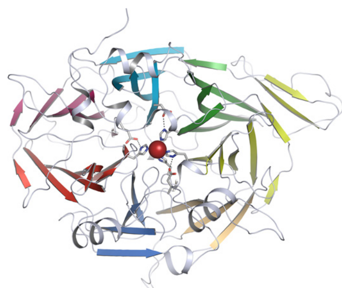
Determining how children progress from uttering their first words to participating in verbal communication is a source of conflict for language researchers. A videotape analysis of toddlers by Colin Bannard et al. suggests that children's early knowledge of language structure may be more limited than previously claimed. After studying 28 hours of taped toddler speech, the authors report that children do not operate with abstract grammars but with concrete words and phrases that include only limited abstractions. For each of two two-year-old toddlers, the authors computed a set of concrete rules based on the language each child produced and compared it with an abstract grammar. A year later, at age three, the same concrete rules did not provide as good an explanation for the toddlers' language composition and structure. The results point to a gradual acquisition of language based initially on specific vocabularies rather than general rules, according to the authors. — T.H.D.

"Modeling children's early grammatical knowledge" by Colin Bannard, Elena Lieven, and Michael Tomasello (see pages 17284–17289)

BIOCHEMISTRY

Protein crystal structure may help explain childhood blindness

Vision is made possible in vertebrates when light entering the retina transforms the visual pigment rhodopsin's chromophore from the *cis* to the *trans* isomer, activating retinal photoreceptors that relay an electrical signal to the brain. Continued sight relies on the RPE65 enzyme, which carries out reconversion of the chromophore to the light-sensitive *cis* isomer. Although the catalytic mechanism of the retinal enzyme is unknown, mutations in RPE65 are known to cause a form of hereditary childhood blindness called Leber congenital amaurosis (LCA). Philip Kiser et al. report on the crystal structure of bovine RPE65 at 2.14-Å resolution and suggest that the structure could reveal how the mutations might disrupt the protein's function. The authors say that RPE65's structure resembles a seven-bladed propeller whose helical cap may house the enzyme's catalytic site. Beneath the cap, an iron atom sits atop



Structure of bovine RPE65.

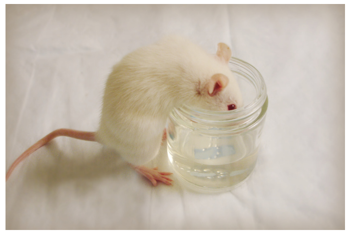
the propeller axis, tethered to an amino acid residue on each of the seven blades. Most human LCA mutations are located within or near the propeller blades, likely disrupting the RPE65 enzyme's 3D structure, substrate binding, or cofactor binding, according to the authors. — P.N.

''Crystal structure of native RPE65, the retinoid isomerase of the visual cycle'' by Philip D. Kiser, Marcin Golczak, David T. Lodowski, Mark R. Chance, and Krzysztof Palczewski (see pages 17325–17330)

PSYCHOLOGICAL AND COGNITIVE SCIENCES

Alcohol wires adolescent brain for risky choices as adults

During adolescence, the brain undergoes critical rewiring and development that can be interrupted through alcohol consumption. Experiments with rats and alcohol-infused gelatin show that abuse of alcohol in adolescence may have detrimental effects on decision making later in life. Nicholas Nasrallah et al. investigated whether consumption of high levels of alcohol impairs decision-making processes in the brain. The authors used a test of risk and reward in adolescent rats, allowing them free access to alcohol-infused gelatin during 20 days of their adolescent period. Three weeks later, at adulthood, the authors trained the rats on a food-reward task similar to gambling and designed to assess the rats' risk tolerance. Adult rats that had consumed larger amounts of the alcohol-infused gelatin in adolescence were significantly more likely to make riskier choices than rats who imbibed lesser quantities. The experimental cohort showed bias toward large but unlikely rewards, whereas rats from the control group chose more consistent rewards. Similar results were observed three months later, well into the rats' adulthood. The findings may help determine the neurobiological link between adolescent alcohol abuse and impaired decision making in adulthood, according to the authors. — T.H.D.



Adolescent rat avidly consuming gel made with alcohol.

''Long-term risk preference and suboptimal decision making following adolescent alcohol use'' by Nicholas A. Nasrallah, Tom W. H. Yang, and Ilene L. Bernstein (see pages 17600–17604)