occupy different regions of quadrupedal locomotor space than primarily quadrupedal species. PCA, primarily weighted by contact time and midstance elbow and knee flexion, successfully grouped primates functionally. Primarily suspensory and leaping species demonstrate the most distinct patterns of quadrupedal movement that appear to equalize effective forelimb and hindlimb limb length. Additionally, suspensory species appear to adopt mechanisms that may moderate compressive forces on forelimb joints. The results demonstrate remarkable variation in quadrupedal mechcanics, provide insight into strategies primates adopt to achieve quadrupedal gaits despite anatomical specializations for other forms of locomotion, and illuminate ways in which animals might transition between modes of locomotion over the course of their evolution.

Reduced Immune Investment with Energy Stress: Evidence from a Mouse Model

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During periods of energy stress, organisms must allocate limited resources to some tasks at the expense of others. Prioritization of energy among competing organ systems during growth in humans and other mammals is understudied. Here, we examine the effects of food restriction and physical activity on organ growth in mice. We placed 32 adolescent female mice (129/SvEv) into four conditions (*n*=8 each): Activity Based Anorexia, ABA (high activity, food restriction); Food Restricted, FR (low activity, food restriction); Wheel Control, WC (high activity, high food availability); and Home Control, HC (low activity, high food availability). After 10 days in each condition, mice were euthanized and their organs weighed. Organ weights (heart, brain, liver, kidney, and spleen), femur lengths, and body masses were compared across conditions. Food restricted mice (ABA and FR) exhibited a reduction in body mass and commensurate reductions in liver, heart, and kidney mass, relative to non-food restricted counterparts (HC and WH). Spleen size was reduced more than other organs, indicating resource allocation away from immune function and prioritization of other systems. We examine these results in light of evidence that the immune response in humans is of high metabolic cost. We discuss the implications of our results for understanding the immune system's function in the evolved metabolic response to energy stress in humans.

Modern Human Variation in Brain Size: Implications for the Dmanisi Hominins and other Fossil Taxa

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How much variation in a particular biological characteristic one can expect within a species is an important consideration when trying to determine whether sets of fossil specimens could conceivably be members of the same species. Some have suggested that the range of morphological variation among the Dmanisi hominins indicates they are likely not members of the same species (e.g., Schwartz et al. 2014). In response, Zollikofer et al. (2014) argue the Dmanisi hominins are not too variable to preclude their being members of the same species. One character not specifically discussed by Zollikofer et al. (2014) is brain size. The Dmanisi hominins range from 546 cc to 775 cc (amounting to 35.5% of their mean cc). Is this unusually large with respect to known within-species ranges of variation? Data on brain size variation within modern humans, from an MRI study of 36 same-sex female sibling pairs (72 individuals in total) shows that the largest *within-family* sib difference (234.9 cc) amounted to 20% of their mean cc. The largest *between-individual* (non-sib) difference amounted to 34.6% of the mean cc - very close to that found among the Dmanisi hominins. Given this sample only included females, and given the sex difference in brain size (~10%), these estimates can be considered lower bounds of the likely range of within-species variation in brain size within humans. Thus, the range of variation in cranial capacity seen among the Dmanisi hominins is not strong evidence that they are members of different species

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Stable Isotope Ratios ($\delta^{13}C$ and $\delta^{15}N$) of Hair Indicate Habitat Ecology and Diet at Two Chimpanzee Study Sites

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Both diet and environment influence the stable isotope ratios of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) in hair keratin. Here we present the results of stable isotope analyses of $\delta^{13}C$ and $\delta^{15}N$ values of chimpanzee (*Pan troglodytes*) hairs from two sites in Tanzania, Ugalla and Gombe. Ugalla is miombo (savanna) woodland with C_4 grass groundcover and small patches of forest, while Gombe is a more forested area that ranges from grassland to tropical rainforest. Samples from Gombe belong to chimpanzees from two groups, Kasekela and Mitumba, which inhabit separate areas of the park. Hairs were collected from night nests between 1989 and 2007.

Within Gombe, Mitumba individuals, who range in a more forested region, exhibit lower $\delta^{13}C$ values and significantly higher $\delta^{15}N$ values ($p=0.005$) in comparison to Kasekela individuals, who range in a more open region, suggesting dietary and/or environmental differences within Gombe. Differences in $\delta^{13}C$ and $\delta^{15}N$ values between Gombe and Ugalla are both significant ($p<0.001$), with Ugalla chimpanzees exhibiting higher $\delta^{13}C$ and $\delta^{15}N$ values relative to Gombe. These follow expectations based on studies of animal proxies, where higher $\delta^{13}C$ and $\delta^{15}N$ values occur in regions of lower precipitation. When compared to other sites the results confirm that $\delta^{13}C$ values are mostly influenced by environmental factors in chimpanzees. Ugalla and Gombe specimens, however, exhibit lower than expected $\delta^{15}N$ values based on precipitation levels when compared with other sites, suggesting that additional factors, such as dietary selectivity, must be considered when interpreting $\delta^{15}N$ values in chimpanzees.

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Meat-eating in hamadryas baboons: temporal patterns of meat consumption and doum palm fruit availability

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Increasingly, primate species have been observed hunting and consuming meat. Meat-eating may provide them with important nutrients that they cannot obtain elsewhere in their diet. Seasonal variation in plant food availability has been suggested to motivate dietary flexibility in a range of species and thus primates may consume more meat when preferred plant resources are unavailable. In this study we investigate the relationship between meat-eating and resource availability in hamadryas baboons (*Papio hamadryas*) at the Filoha site in Awash National Park, Ethiopia. The Filoha baboons rely on doum palm fruit, a high quality resource unavailable elsewhere in hamadryas range, for several months of the year. We predicted that hamadryas baboons at Filoha would consume more meat when doum palm fruit is unavailable. We recorded meat-eating instances and monitored the availability of doum palm fruit from March 2005-February 2006. Consistent with our prediction, the mean daily rate of meat-eating instances when palm fruit was not abundant was 0.124 compared to 0.058 when palm fruit was available. There was no difference, however, in the rate of meat-eating