1	The Wood pecker's Head structure: The antishock mechanism	The mechanical properties of the skull and the anti-shock characteristics of woodpecker's head were studied and simulated. The woodpecker's head moved in straight trajectory and reached the maximum speed of 5 $m \cdot s_{-1}$ – 7 $m \cdot s_{-1}$ and the deceleration of 600 g – 1500 g within a 0.5 ms – 1 ms impacting duration. On the same impacting duration, the human being's brain would be injured severely as the upmost tolerance is only 300 g deceleration. (a) There are several kinds of micro-structure in woodpecker skull, and the Young's modulus around the skull is non-uniform but changes periodically. (b) The inhomogenous mechanical property and special structure of the woodpecker's skull inspire one to design light engineering structure which not only itself shows a good shock-absorbing function, but also can protect the instruments or the important elements inside the structure, for example, light and high performance helmets, spacecraft, *etc*. (c) The special design of the woodpecker's skull also inspires us to improve the g-force tolerance of micromachined devices at high-g and high-frequency mechanical excitations. The large gaps among the natural, working and stress response frequencies enable the woodpecker to effectively protect its brain from the resonance injury