

Glires are a large group of mammals, including fossil and extant rodents, such as mouse, beaver and guinea pig, and lagomorphs, that is rabbits, hares, and pikas. Looking at the world of living mammals, rodents cover roughly about half of their diversity. They are almost ubiquitous on our planet, in nearly all environments; they dig underground extensive burrowing systems, they climb trees, swim in the water and even fly, although only as gliders. On the other hand, their Glires counterparts, lagomorphs, are not so widely adapted and come only in two basic body-plans: long-legged and long-eared hares and rabbits and short-legged (and with round ears) pikas. Nevertheless, both rodents and lagomorphs are closely related, just as the old saying goes: they are all kith and kin.

The oldest currently known Glires comes from the Paleocene rocks (dated on ca. 63 million years) of southern China (Anhui Province) and is called *Mimotona*, which means 'an animal that imitates pika'. The *Mimotona* skull indeed resembles, at a glance, modern pikas. *Mimotona* is simultaneously one of the oldest known placental mammals. The presence of an unquestionably placental mammal so close to the Cretaceous/Paleogene boundary suggests that the true placental mammals evolved still during the Mesozoic, in the shadow of the last dinosaurs, and that modern mammalian orders did not make 'Jack-in-the-box' appearance within 200,000 years in the early Paleogene.

Our project aims at giving as complete evolutionary picture of Glires as possible. We plan to reconstruct the most ancient Glires representative external appearance and how it lived. This in turn will inform us if 'modern' mammals did arise in the Paleogene or rather in the Cretaceous. In order to learn all these details our team will study the oldest representatives of Glires and their kin and compare their morphology with a number of modern species, including Asian tree-shrews. In our study we will use novel analytic tools, ranging from microtomography and synchrotron to morphometrics to complex phylogenetic applications. Further, we plan to dig for some fossils of the earliest Glires in Asia, their probable homeland.