DNA (that do not change the molecular code of a gene but instead alter when the gene is activated), which may offer protection to their offspring. In addition, Putnam is keen to continue studying the youngsters through to adulthood and beyond, to find out whether their own young will benefit from the parents' experience: maybe the coral's future is less bleak than we thought.

10.1242/jeb.128694

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Kathryn Knight

Snow leopard haemoglobin unprepared for high-altitude life

Prowling through the icy Himalaya mountains, snow leopards seem unfazed by the rarefied atmosphere. Yet, according to an international team of researchers lead by Jay Storz from the University of Nebraska, USA, Jan Janecka from Duquesne University, USA, and Angela Fago from Aarhus University, Denmark, cats of all shapes and sizes are notoriously poor at coping when oxygen is scarce. 'Members of the cat family have haemoglobins [the protein that carries oxygen in the blood] with unusually low oxygen affinities', says Storz – which makes it tough for cats to scavenge oxygen from thin air. Yet, snow leopards, which are content at altitudes greater than 6000 m, buck the trend. Could their haemoglobin be modified to carry more oxygen than the haemoglobins of other cats?

Collaborating with zoos across the USA, the team obtained valuable blood samples from big cats including two African lions, a tiger, one leopard, four snow leopards and a panther, ready for Janecka and Trevor Anderson to clone and sequence the genes for the oxygen-carrying blood protein. However, when Frederico Hoffmann, Janecka and Storz analysed the protein sequence, they were astonished to see that the snow leopards carried exactly the same amino acid swap that compromises the ability of all other cat haemoglobins to carry oxygen. And when Simone Nielsen, Sidsel Andersen, Roy Weber and Fago measured the oxygenation of the cats' haemoglobin, with and without 2-3, diphosphoglycerate (DPG) – which helps haemoglobin to offload oxygen when it is required – the protein showed weak oxygen binding and all of the cat haemoglobins were completely unresponsive to the beneficial effects of DPG.

So, the snow leopards' haemoglobin is equally as inefficient as the haemoglobins of all other big cats and the haemoglobins are structurally and functionally almost identical to those of house cats. However, Storz suspects that the animals compensate for the poor oxygen capacity of their blood by simply breathing harder, and Janecka is keen to compare the performance of tigers and snow leopards at altitude: 'Sounds crazy, but I think it is possible', he chuckles.

10.1242/jeb.128710

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Kathryn Knight
Kathryn@biologists.com