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How early mammals evolved night vision to escape dinos

By Helen Briggs
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Night-time vision evolved millions of years ago in early mammals, a study suggests.

The photoreceptors that help us see in dim light developed from colour-detecting cone cells in Jurassic mammals, according to genetic evidence.

The evolution of night-time vision is regarded as a landmark event in the rise of mammals.

A nocturnal lifestyle allowed the first of their kind to avoid predatory dinosaurs, say scientists.

Co-researcher Dr William Ted Allison of the University of Alberta, Canada, said the development of night vision was a "critical step" in the dominance of mammals.

"We're learning how mammals evolved their vision to survive at night-time and avoid dinosaurs," he told the BBC.

"That's what allowed mammals to diversify and become abundant in the world.

"They did that by switching their daytime vision in the cones to allow night-time vision using their rods."

Rods and cones

- When light enters the eye, it ultimately reaches the retina, which is the light-sensing structure of the eye.
- The retina contains two types of photoreceptor cells, called rods and cones.
- Rods are responsible for vision at low light levels. They do not help in colour vision.
- Cones are specialised for resolving fine detail in bright light.
- Animals that are active in both day and night need to have two systems.

Genetic research published in the journal, **Developmental Cell**, suggests the light-sensitive rod cells in our eyes originally developed from colour-detecting cone cells millions of years ago.

Evolutionary question

Early mammals lived alongside dinosaurs hundreds of millions of years ago, adopting a nocturnal lifestyle to avoid being attacked when dinosaurs were active by day.

It has been a mystery how early mammals evolved the night vision that enabled them to survive and prosper.

Anand Swaroop of the National Eye Institute, part of the US National Institutes of Health, commented: "The majority of mammals have rod-dominant retinas, but if you look at fish, frogs, or birds, the vast majority are cone-dominated - so the evolutionary question has always been, 'What happened?'"

The researchers analysed the genetics of rod and cone cells in mice, zebra fish and other animals.

They found there was a switch towards a dominance of cones over rods in early mammals.

"...Early mammals changed one type of cell from capturing UV light - which isn't necessary at night - to something that is just extremely sensitive to light," said Dr Swaroop.

Humans depend more on cones for our vision, but that happened later when our ancestors evolved to take advantage of the daylight hours again.

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