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# Naked mole-rat gives cancer clues

By Helen Briggs BBC News



Naked mole-rat: It lives to 30 or more and doesn't get cancer

A rodent that never gets cancer could hold the key to preventing or treating malignant tumours, say scientists.

Lab studies show the skin cells of the naked mole-rat are high in a natural sugary substance that stops tumours developing.

The findings could lead to new human cancer therapies in the long term, researchers report in Nature journal.

A similar version of the chemical is used as a medicine to treat arthritis and in anti-wrinkle jabs.

A team led by researchers from the University of Rochester, New York, US, investigated the anti-cancer properties of the naked mole-rat.

Unlike other small rodents, such as rats and mice, the curious creature does not get cancer in later life.

Tissue repair

"This fascinating research builds on previous work revealing the biological tricks mole rats have evolved to prevent cancer"

Oliver Childs Cancer Research UK

The US team, led by Andrei Seluanov and Vera Gorbunova, cultured skin cells from the rodent in the laboratory.

They found that the animal's tissues were rich in high molecular weight hyaluronan (HMW-HA), a gooey sugar that is involved in tissue repair.

Similar versions of the substance are licensed to relieve pain in arthritis and are used as cosmetic fillers to treat wrinkles, say the researchers.

Experiments show that when HMW-HA is removed from naked mole-rat cells, they become susceptible to cancer, suggesting it plays a role in making the rodent "cancer-proof".

Dr Gorbunova told BBC News: "Studying animals that are naturally cancer-resistant can be very rewarding and can lead to discovery of mechanisms that can benefit humans in terms of treatment and prevention of cancer."

#### Flexible skin

The researchers think the substance gives the naked mole-rat its distinctive, elastic "baggy" skin, which it needs to squeeze through underground tunnels.

## The naked mole-rat

- Naked mole-rats can live for around 30 years, an age unprecedented in small rodents
- Mice, in comparison, live for no longer than 4 years
- The rodent has no fur and spends its life living underground in dark tunnels in a colony

While it has probably evolved to provide the rodent with an exceptionally flexible skin, it also gives protection against cancer, possibly by stopping cancerous cells from dividing.

The next step, they say, is to test the chemical in mice, then human cells.

Dr Seluanov added: "There's indirect evidence that HMW-HA would work in people.

"It's used in anti-wrinkle injections and to relieve pain from arthritis in knee joints, without any adverse effects.

"Our hope is that it can also induce an anti-cancer response."

The study, carried out with scientists in China and Israel, is published in the journal Nature.

#### No beauty

Commenting on the research, Oliver Childs of Cancer Research UK said new cancer treatments from the research were "a long way off".

"They're not going to win any beauty contests, but these curious creatures have long interested scientists because of their exceptionally lengthy life spans and resistance to cancer," he said.

"This fascinating research builds on previous work revealing the biological tricks mole-rats have evolved to prevent cancer.

"It's a long way off, but it will be interesting to see if further research can find a way to use hyaluronan to help prevent or treat cancer in humans."

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## Neanderthal clues to cancer origins

By Helen Briggs BBC News



Abnormal bone of the Neanderthal (above) compared with normal Neanderthal specimen (below)

A Neanderthal living 120,000 years ago had a cancer that is common today, according to a fossil study.

A fossilised Neanderthal rib found in a shallow cave at Krapina, Croatia, shows signs of a bone tumour.

The discovery is the oldest evidence yet of a tumour in the human fossil record, say US scientists.

The research, published in the journal PLOS One, gives clues to the complex history of cancer in humans.

Until now, the earliest known bone cancers have been identified in ancient Egyptian remains from about 1,000-4,000 years ago.

"Some people think that cancer is only a modern disease, but there's evidence from fossils, bones and mummies that it's actually many thousands of years old"

Dr Kat Arney Cancer Research UK

"It's the oldest tumour found in the human fossil record," Dr David Frayer, the University of Kansas anthropologist who led the US team, told BBC News.

"It shows that living in a relatively unpolluted environment doesn't necessarily protect you against cancer, even if you were a Neanderthal living 120,000 years ago."

Complex history

The fossil was uncovered from an important archaeological site that has yielded almost 900 ancient human bones, along with stone tools.

The cancerous rib is an incomplete specimen, so the overall health impact of the tumour on the

individual cannot be established.

The tumour was diagnosed by a medical radiologist from X-rays and CT scans.

Although efforts to extract ancient DNA from the Neanderthal fossil have proved unsuccessful, the researchers hope other fossils may shed light on cancer in prehistoric humans.

Commenting on the study, Kat Arney, science information manager at Cancer Research UK, said: "Some people think that cancer is only a modern disease, but there's evidence from fossils, bones and mummies that it's actually many thousands of years old.

"So this discovery isn't entirely surprising, even though such finds are very rare, but it helps to shed light on the complex history of cancer in humans and our ancient relatives."