# Dinosaurs’ ancient proteins offer new clues for cancer treatment



Recent research suggests that dinosaurs may offer unexpected insights into cancer treatment. This notion arises from studies conducted by scientists at Anglia Ruskin University and Imperial College London, who explored the fossil of *Telmatosaurus transsylvanicus*, a 'marsh lizard' that lived between 66 and 70 million years ago. They propose that soft tissue and cellular structures in ancient remains might be preserved more frequently than previously realised, potentially unveiling crucial information regarding the origins of diseases such as cancer.

Senior author Justin Stebbing, a Professor of Biomedical Sciences at Anglia Ruskin University, articulated the appeal of studying these ancient creatures. "Dinosaurs, as long-lived, large-bodied organisms, present a compelling case for investigating how species managed cancer susceptibility and resistance over millions of years," he remarked. The research outlined that proteins, especially those found in calcified tissues like bone, are more stable than DNA and are less prone to degradation. This stability makes them prime candidates for studying ancient diseases, including cancer.

The scientists have turned their attention to *Telmatosaurus transsylvanicus*, which roamed the territory of present-day Romania. Using Scanning Electron Microscopy (SEM), they discovered structures within the fossil resembling red blood cells. This is a significant advancement, as it builds on prior studies revealing evidence of cancer within the same species and highlights the critical need to involve soft tissue analyses, which can yield molecular insights into disease mechanisms.

Further supporting this line of inquiry are findings from earlier research that have established cancer's ancient history. For instance, discoveries made by researchers from the Natural History Museum and the Royal Ontario Museum in 2020 unveiled the presence of osteosarcoma, a malignant bone cancer, in a 76-million-year-old *Centrosaurus*. This significant revelation indicates that cancer has likely afflicted vertebrates for millions of years and raises intriguing questions about the evolutionary trajectory of the disease and possible avenues for modern research.

Moreover, a collaborative investigation by Vrije Universiteit Brussel and Université de Liège has shown that even the largest dinosaurs, such as sauropods, were susceptible to bone diseases, including malignancies. This evidence underscores a long-standing interaction between large-bodied organisms and cancer, suggesting that the evolutionary history of diseases can inform contemporary health challenges.

The implications of this research extend beyond palaeontology. As Professor Stebbing noted, "Unlike skeletal structures alone, soft tissues contain proteins that provide molecular information that can reveal the underlying biological mechanisms of disease." This underscores the potential for palaeobiological research to inform modern medical treatments. However, scientists stress the importance of coordinated efforts in long-term fossil conservation to ensure that future studies can leverage these findings for advancing human health.

The way forward may involve employing underused methods to delve deeper into the molecular biology of ancient species, potentially paving the way for discoveries that could significantly benefit human medicine. As research continues to unfold, the relationship between dinosaurs and modern diseases becomes an intriguing narrative of evolution and disease management, opening new dimensions in our understanding of health across the ages.

## Reference Map:

* Paragraph 1 – [[1]](https://www.mirror.co.uk/news/health/dinosaurs-hold-unlikely-key-cancer-35312701), [[2]](https://www.nhm.ac.uk/discover/news/2020/august/dinosaur-diaries-human-cancer-found-in-dinosaur-bone.html)
* Paragraph 2 – [[1]](https://www.mirror.co.uk/news/health/dinosaurs-hold-unlikely-key-cancer-35312701), [[3]](https://osinst.org/osteosarcoma-dinosaur-bone/)
* Paragraph 3 – [[4]](https://www.vub.be/en/news/research-vub-uliege-shows-dinosaurs-had-cancer), [[5]](https://www.theguardian.com/science/2003/oct/23/dinosaurs.science)
* Paragraph 4 – [[6]](https://www.abc.net.au/science/articles/2003/10/29/975839.htm), [[7]](https://www.npr.org/2020/08/04/899060875/scientists-discover-malignant-cancer-in-a-dinosaur)

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## Bibliography

1. <https://www.mirror.co.uk/news/health/dinosaurs-hold-unlikely-key-cancer-35312701> - Please view link - unable to able to access data
2. <https://www.nhm.ac.uk/discover/news/2020/august/dinosaur-diaries-human-cancer-found-in-dinosaur-bone.html> - In August 2020, researchers from the Natural History Museum and the Royal Ontario Museum discovered the first evidence of cancer in a dinosaur bone. They identified osteosarcoma, a malignant bone cancer, in the fibula of a 76-million-year-old Centrosaurus. This finding suggests that cancer has been present in vertebrates for at least 76 million years, providing insights into the evolutionary history of the disease and potential implications for modern cancer research.
3. <https://osinst.org/osteosarcoma-dinosaur-bone/> - In 2020, researchers identified osteosarcoma, an aggressive bone cancer, in a 77-million-year-old Centrosaurus fibula. This discovery, made by a multidisciplinary team, highlights the deep evolutionary history of cancer and underscores the need for continued research into its origins and treatment. The study was referenced in a 2021 article in the New England Journal of Medicine, emphasizing the significance of this finding in understanding osteosarcoma.
4. <https://www.vub.be/en/news/research-vub-uliege-shows-dinosaurs-had-cancer> - A collaborative study by Vrije Universiteit Brussel and Université de Liège demonstrated that sauropods, the largest dinosaurs, were susceptible to bone diseases, including malignant cancers. Researchers examined bone samples from early sauropods and found structures indicative of cancer, such as microscopic bone spurs associated with malignant tumours. This research provides evidence that cancer was present in dinosaurs, offering insights into the evolutionary history of the disease.
5. <https://www.theguardian.com/science/2003/oct/23/dinosaurs.science> - In 2003, researchers discovered that many dinosaurs, particularly hadrosaurs, suffered from cancer. A study involving X-ray scans of 10,000 dinosaur vertebrae from over 700 specimens found 29 tumours in bones from 97 hadrosaur individuals. The findings suggest that cancer has been present in vertebrates for at least 70 million years, indicating that diseases can affect different species similarly across time.
6. <https://www.abc.net.au/science/articles/2003/10/29/975839.htm> - In 2003, a study led by Bruce Rothschild used X-ray techniques to scan 10,000 dinosaur vertebrae from 700 museum specimens, including species like Tyrannosaurus and Triceratops. The team found tumours only in hadrosaurs, or duck-billed dinosaurs, with 29 tumours in bones from 97 individuals. Most were tumours of the blood vessels, suggesting that cancer has been around relatively unchanged for up to 100 million years.
7. <https://www.npr.org/2020/08/04/899060875/scientists-discover-malignant-cancer-in-a-dinosaur> - In August 2020, scientists from Canada's Royal Ontario Museum and McMaster University identified malignant bone cancer in a 76 to 77 million-year-old Centrosaurus fibula. This discovery, published in The Lancet Oncology, suggests that dinosaurs were afflicted by bone cancer and likely other cancers found in vertebrates today, providing new insights into the health and biology of these ancient creatures.