

Endogenous proteins found in a 70-million-year-old giant marine lizard

May 2 2011



One of the most well preserved mosasaur skulls in the world. Fossil at Museum of Paleontology, University of California Berkeley, California. Photo: Johan Lindgren

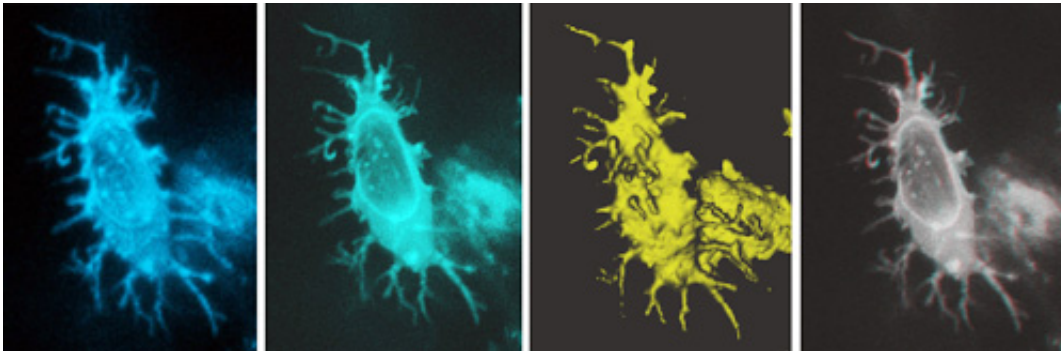
(PhysOrg.com) -- With their discovery, the scientists Johan Lindgren, Per Uvdal, Anders Engdahl, and colleagues have demonstrated that remains of type I collagen, a structural protein, are retained in a mosasaur fossil.

The scientists have used synchrotron radiation-based infrared microspectroscopy at MAX-lab in Lund, southern Sweden, to show that amino acid containing matter remains in fibrous tissues obtained from a mosasaur bone.

Previously, other research teams have identified collagen-derived

peptides in dinosaur fossils based on, for example, mass spectrometric analyses of whole bone extracts.

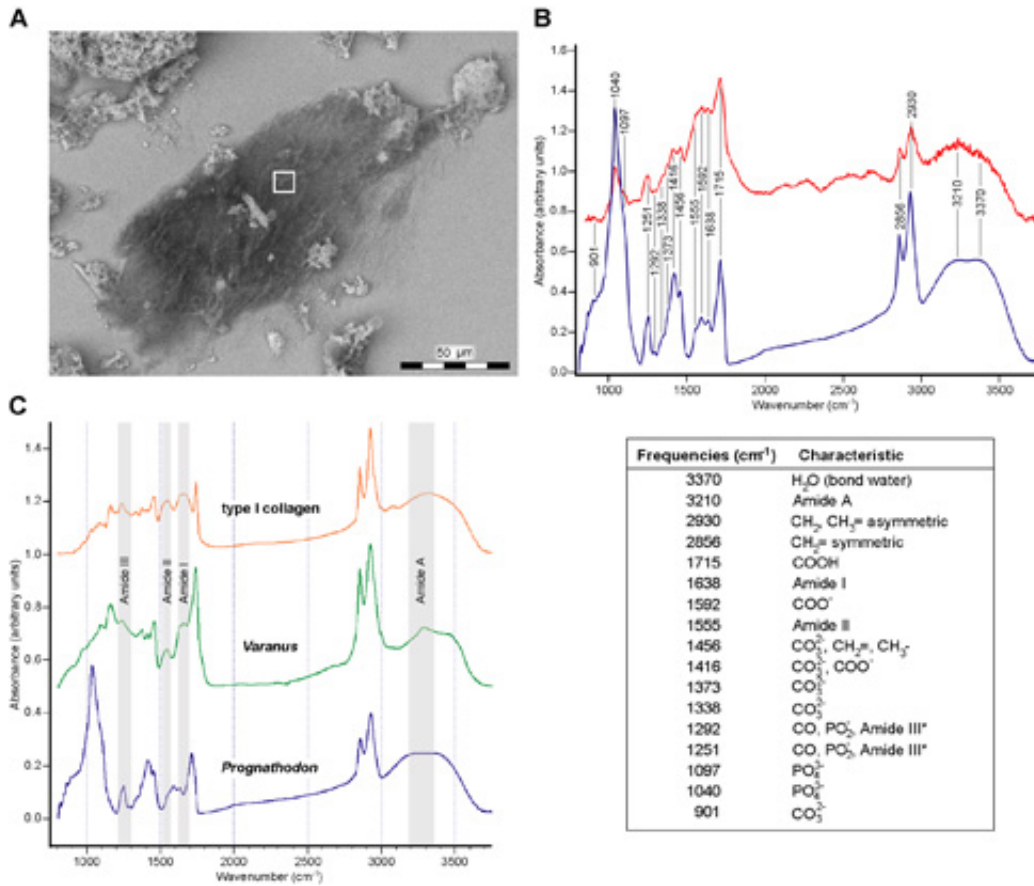
The present study provides compelling evidence to suggest that the [biomolecules](#) recovered are primary and not contaminants from recent bacterial biofilms or collagen-like proteins.



KConfocal microscopic pictures of an osteocyte-similar structure. Osteocytes are cells that are producing typ I collagen. Photo: Johan Lindgren

Moreover, the discovery demonstrates that the preservation of primary [soft tissues](#) and endogenous biomolecules is not limited to large-sized bones buried in fluvial sandstone environments, but also occurs in relatively small-sized skeletal elements deposited in marine sediments.

A paper reporting the discovery, 'Microspectroscopic Evidence of Cretaceous Bone Proteins' is now available in the scientific journal *PLoS ONE*.



Infrared microspectroscopy of fibres isolated from a mosasaur bone. (a) SEM-picture of the fibres. The white square marks the area measured by synchrotron light. (b) Absorbans spectra from the fibre bundle reproduced in a (red=synchrotron light; blue=conventional light). (c) Comparison between absorbans spectra from recent typ I collagen, osteoid from a recent monitor lizard (varan), and fibres from a mosasaur (Prognathodon). Photo and source: Johan Lindgren

Facts:

- Mosasaurs are a group of extinct varanoid lizards that inhabited marine environments during the Late Cretaceous (approximately 100-65 million year ago).

- Collagen is the dominating protein in bone.
- The scientists have applied a broad spectrum of sophisticated techniques to achieve their results. In addition to synchrotron radiation-based infrared microspectroscopy, [mass spectrometry](#) and amino acid analysis have been performed.
- Virtually all experiments have been made in Lund. At MAX-lab, the experiments have been conducted at the MAX I ring, beamline 73.

More information: www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0019445

Provided by Lund University

Citation: Endogenous proteins found in a 70-million-year-old giant marine lizard (2011, May 2) retrieved 29 April 2024 from <https://phys.org/news/2011-05-endogenous-proteins-million-year-old-giant-marine.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.