Xcyte

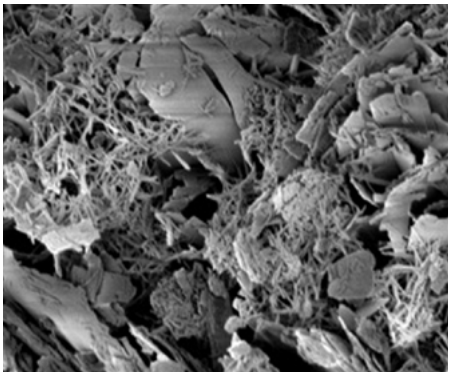
Nanosynthetic bone graft

Bone healing set in motion

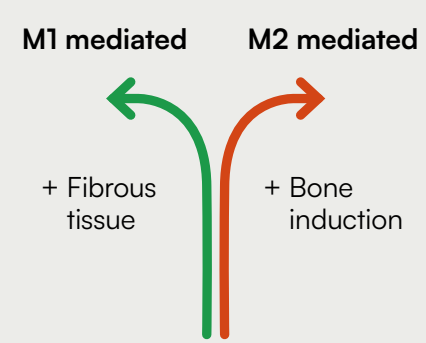
Introducing Xcyte nanosynthetic bone graft putty,
for safe predictable bone regeneration

Xcyte Science

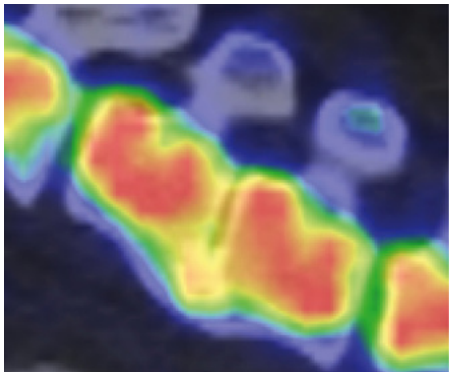
Nanoscale structure and bioactive chemistry drive new bone formation via an osteoimmune response



Xcyte's unique nanocrystalline structure and bioactive chemistry harness local bone formation pathways.



Macrophage polarization is driven towards the bone-inducing M2 phenotype.



Xcyte is remodeled into healthy vascularized bone.
(Image shows PET/CT with 18F-sodium fluoride)

Harness the innate power of osteoimmunology

Xcyte's patented 3-phase calcium phosphate chemistry and instructive nanocrystalline structure are designed to promote rapid and reliable bone formation by harnessing the body's natural healing properties.

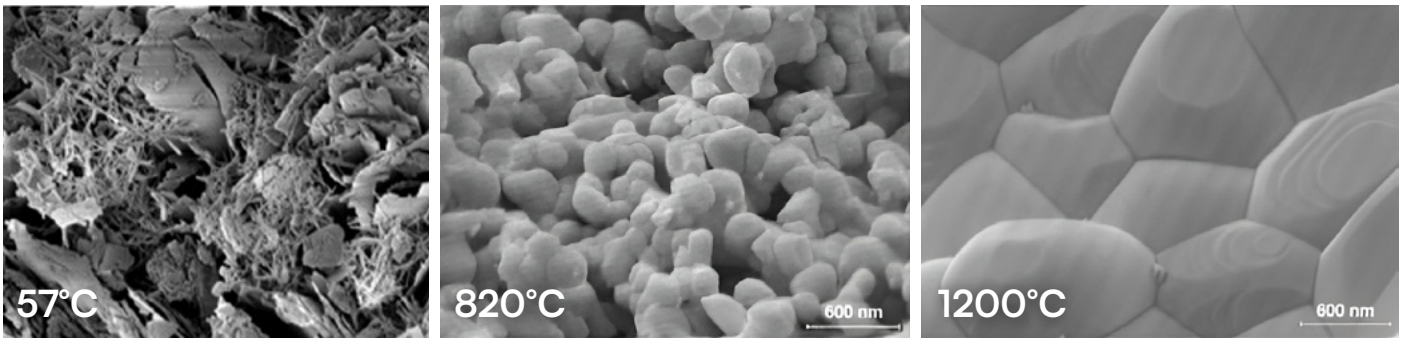
Its unique nanostructure and chemistry stimulate positive inflammatory response, characterized by the involvement of pro-healing M2 macrophages. Once activated, these M2 macrophages release various growth factors, including BMP-2, and initiate a natural bone healing cascade by in which cell-mediated scaffold resorption leads to rapid, effective repair of bone tissue.

- Instructive nanocrystalline structure activates pro-healing M2 macrophages
- A natural bone healing cascade is initiated, with cell-mediated scaffold resorption
- 3-phase calcium phosphate chemistry amplifies bone formation pathways
- Rapid, effective and predictable bone healing

Favorable nanostructure
How is this different from other materials?

In contrast to many competitor materials, the low-temperature manufacturing process for Xcyte results in a nanostructure that is conducive to bone cell differentiation and proliferation.

Biological Activity



Temperature

Nanoscale 'rough' surface of Xcyte drives macrophage polarization to M2 phenotype. This initiates the differentiation of mesenchymal progenitor cells, starting the bone formation cascade.

High temperature processes used to manufacture competitor products create a biologically inert surface topography, where M1 phenotypes dominate and more fibrous tissue is formed.

Novel Chemistry: Unique 3-phase calcium phosphate chemistry amplifies bone formation

1. Calcium deficient hydroxyapatite 80-95 wt%	Similar to bone mineral
2. α - TCP <10 wt%	Superior bioactivity vs β-TCP
3. Calcium pyrophosphate 0.1-10 wt%	Promotes increased bone formation in ovine studies

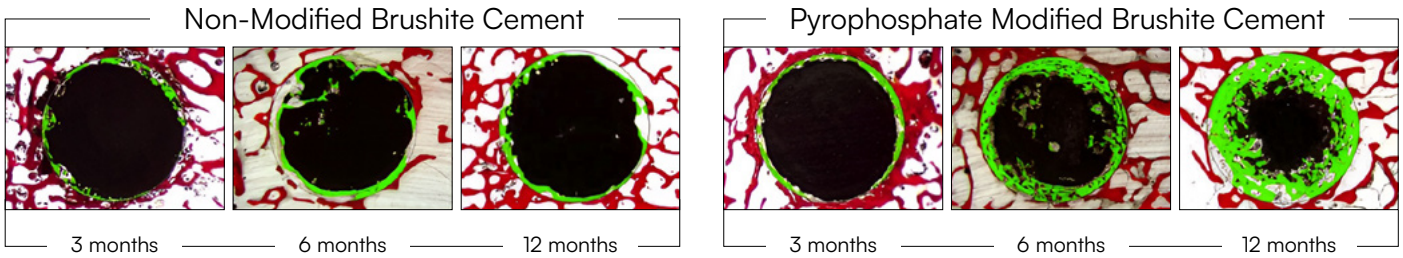
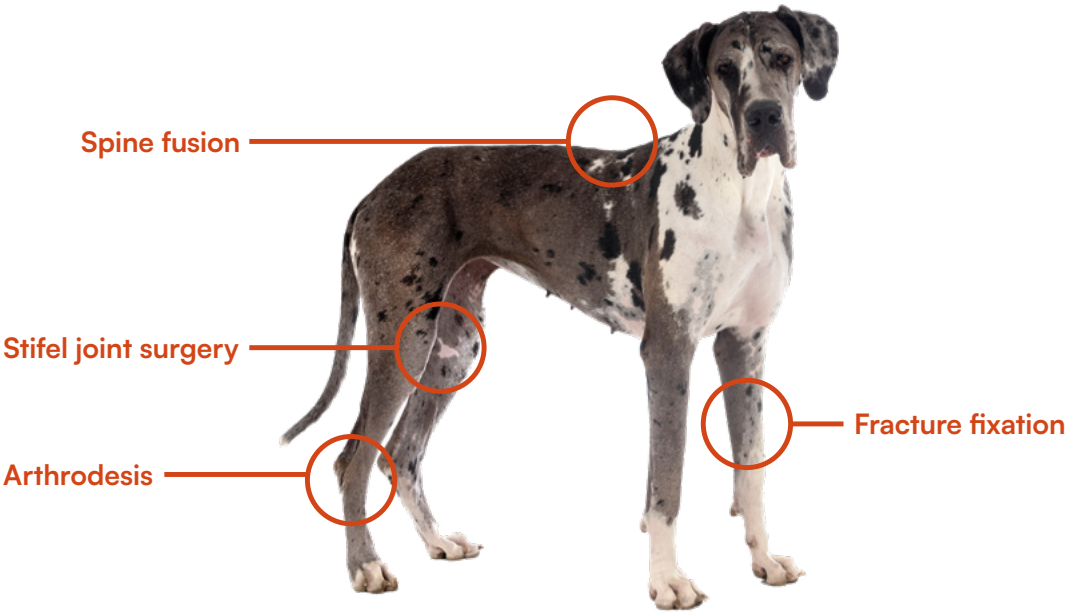


Diagram showing increased bone formation over time in the presence of pyrophosphate

L.M. Grover et al. / Biomaterials 34 (2013) 6631-6637

Clinical applications



- Sterile & ready for immediate use
- Moldable cohesive putty that is easy to handle
- Versatile - can be used across multiple surgery types
- Reduces surgery times compared with autograft harvest

Clinical case with Xcyte Nanosynthetic Bone Graft

Performed at Vetsuisse Bern by Prof. Franck Forterre

Summary

- Road traffic accident: one-year-old male, Cane Corso
- Presented with right limb monoplegia, left hind limb monopareses and uniform tail paralysis
- CT showed highly comminuted compression fracture L3 vertebral body and left pedicle (image 1)
- Surgery to remove fracture fragments (image 2). Xcyte was implanted in remaining bone voids.
- 7 months follow-up, dog able to walk normally and no neurological limitations
- CT scan (image 3) shows excellent healing / remodeling of Xcyte

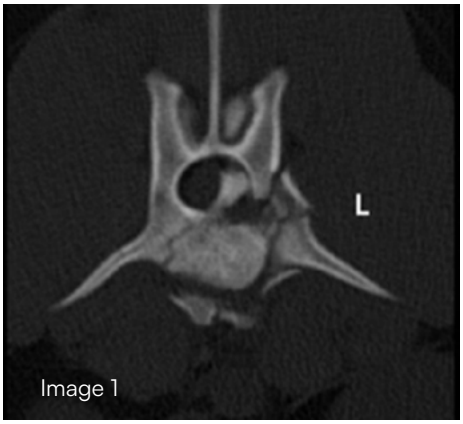


Image 1

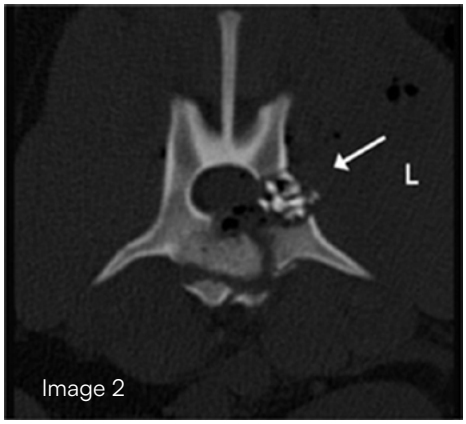


Image 2

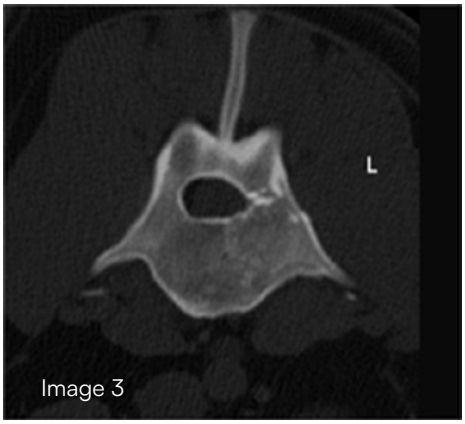


Image 3

Details

A one-year-old neutered male Cane Corso was brought to the small animal hospital after being hit by a car. He was lethargic and unable to walk. He presented with monoplegia with deep pain in the right hind limb and monopareses in the left hind limb. The tail was uniformly paralyzed. The neurological localization for the suspected vertebral damage was identified as the mid to caudal lumbar region. After initial stabilization, a CT scan was performed and revealed a highly comminuted compression fracture of the L3 vertebral body and pedicle on the left side. Multiple fracture fragments were visible within the spinal canal compressing the spinal cord (Figure 1).

Surgery was performed to remove the fracture fragments within the spinal canal. In addition, a new osteoinductive material, Xcyte was placed at the fracture site to promote bone healing. First a small fat graft was inserted to protect the spinal cord from the new bone formation. Xcyte was then gently placed to fill the bone defect within the vertebral pedicle (Figure 2).

At a follow-up visit 7 months after surgery, the dog was able to walk normally and, according to the owner, was living a normal life with no neurological limitations. A control CT scan showed complete healing of the fracture site at this time (Figure 3).

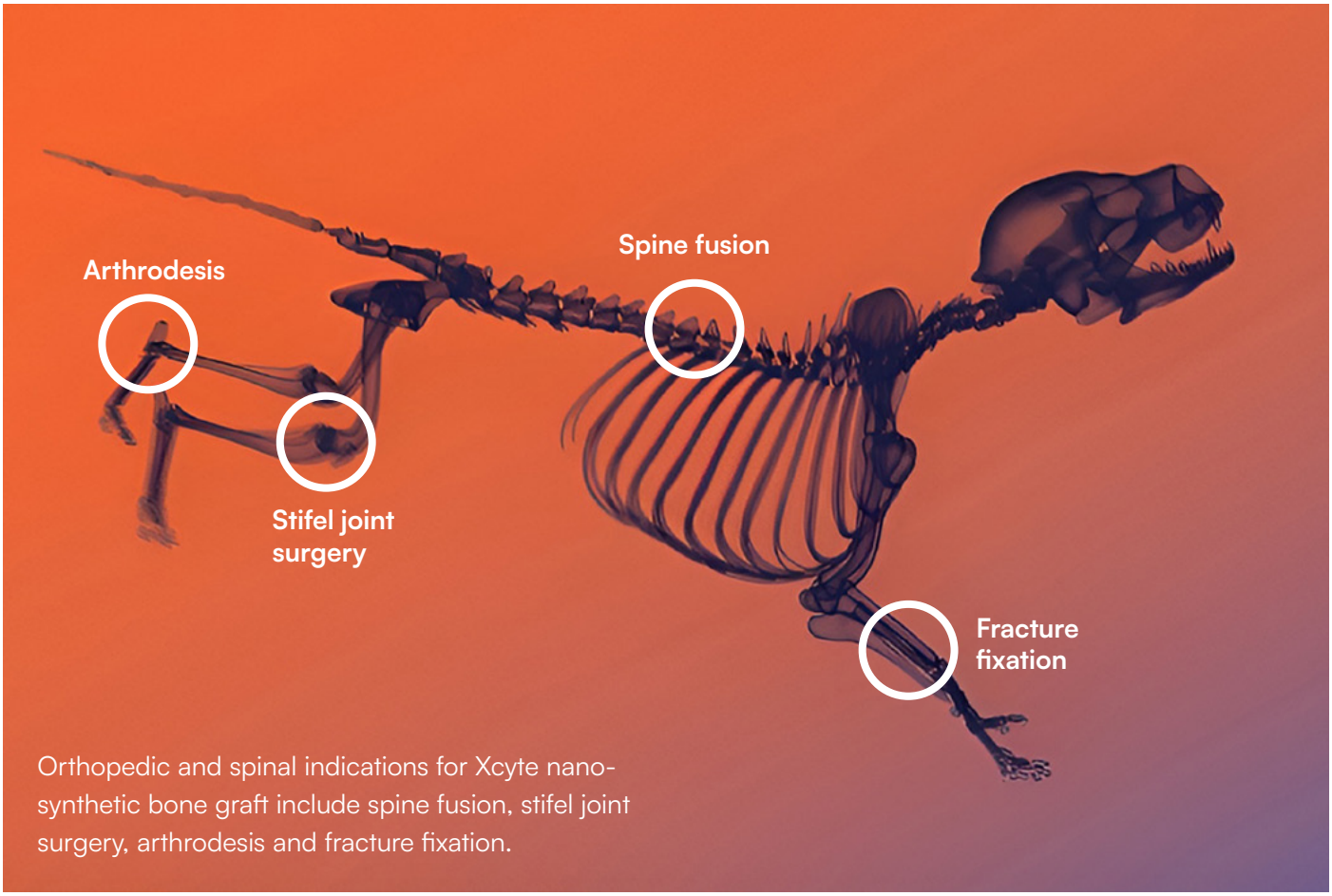
Every pet has the right to an active life. Now there is a safe, predictable way to regenerate bone and reactivate pets.

Every pet deserves the best available care

The result of years of academic research and clinical development by leading biomaterial experts and veterinary surgeons, Xcyte is now available for every pet in need.

Cavix is dedicated to accelerating the evolution of veterinary care by transforming the latest biomedical innovations into well-documented veterinary therapies. Together with world-renowned veterinary surgeons, we're bringing together the necessary scientific, commercial and clinical expertise to give every pet the care they deserve.

Based at Green Innovation Park, an innovation hub at the Swedish University for Agricultural and Veterinary Science in Uppsala, our founding team is grounded in advanced research into regenerative technologies for bone defects.



Orthopedic and spinal indications for Xcyte nano-synthetic bone graft include spine fusion, stifel joint surgery, arthrodesis and fracture fixation.

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