AUGMATRIX™
Biocomposite Bone Graft

With a more natural bone mineral and more collagen than ordinary synthetic matrices.

Now you can reject ordinary in your everyday needs, too.
Versatility by design AUGMATRIX™ Biocomposite Bone Graft is available in multiple forms to suit an array of bone grafting challenges.
Reject ordinary with a more natural bone mineral and more collagen.

AUGMATRIX™ Biocomposite Bone Graft is comprised of 55% carbonated apatite (a type of calcium phosphate) and 45% bovine Type I collagen (w/w). Carbonated apatite more closely resembles the mineral phase of natural bone in chemical composition and structure than common minerals found in ordinary matrices, such as pure phase beta tricalcium phosphate (β-TCP) and hydroxyapatite (HA). And 45% collagen is more than double the amount found in ordinary matrices, which typically contain ≤20% collagen.

Quick absorption to the core

AUGMATRIX™ is 95% porous. Its interconnected pore structure provides efficient absorption of fluid and stem cell retention. Bone marrow aspirate (BMA) penetrates all the way to the core of shaped devices almost instantaneously – no more dry, brittle shapes.

Maximum flexibility

Upon saturation with BMA, AUGMATRIX™ offers maximum flexibility and ease of implantation to fit even the most challenging applications.
AUGMATRIX™ – Compositional Advantages

AUGMATRIX™ Biocomposite Bone Graft has a unique composition relative to other synthetic bone grafts. Laboratory studies were conducted to examine the physical and chemical properties of AUGMATRIX™ compared to Vitoss Foam.

Homogeneous, Not Heterogeneous
AUGMATRIX™ has an interconnected network of collagen with a uniform pore size and a homogeneous distribution of carbonated apatite, compared to heterogeneous characteristics found in Vitoss.

Chemical Composition Comparison
The chemical composition of the carbonated apatite in AUGMATRIX™ more closely resembles natural bone compared to the β-TCP in Vitoss. Fourier Transform Infrared (FTIR) spectra show the carbonate substitution at 840 and 1410-1450 cm⁻¹ occur in carbonated apatite (AUGMATRIX™) and allograft bone but not in HA or β-TCP (Vitoss).

Dotted lines = carbonate peaks; shaded box = phosphate peaks

Structural Comparison
The crystalline structure of the carbonated apatite in AUGMATRIX™ more closely resembles natural bone compared to the β-TCP in Vitoss. The X-ray Diffraction (XRD) pattern below (peak position, intensity, width, and shape) indicates carbonated apatite (AUGMATRIX™) more closely resembles the calcium phosphate phase of allograft compared to β-TCP (Vitoss).

Carbonated Apatite is More Similar to Natural Bone
As depicted in the schematic below, the relative crystallinity and solubility of the carbonated apatite in AUGMATRIX™ is more consistent with the mineral phase of natural bone than the β-TCP in Vitoss.

1Data on file. Vitoss is manufactured & distributed by Stryker Corp.
**AUGMATRIX™ - Performance Advantages**

In a laboratory study evaluating the early in vivo response in an ovine bone defect model, AUGMATRIX™ demonstrated excellent performance characteristics compared to Vitoss.

**Easy to Implant**

8 mm x 20 mm bilateral defects were made in the distal femur and proximal tibia of sheep. The defects were then filled with AUGMATRIX™ or Vitoss saturated with heparanized sheep BMA.

**AUGMATRIX™ was easy to implant**

**AUGMATRIX™ swelled to fit the defect**

**Vitoss**

Due to stiffness, Vitoss required more manipulation to implant

Due to brittle nature, stray Vitoss particles were observed outside the defect area (arrow).

**Retains More BMA**

Histology images of filled defects 3 days post-implantation show improved infiltration of BMA in the AUGMATRIX™ group compared to the Vitoss group.

**AUGMATRIX™**

**Vitoss**

Paraffin histology with tetrachrome stain. Brown staining indicates bone marrow cells. Dense red staining in the defect indicates residual collagen from the matrix.

**Significantly More Bone Formation at 4 Weeks**

Histology images (below left) of filled defects 28 days post-implantation show more new bone within the defect in the AUGMATRIX™ group compared to the Vitoss group. Histomorphometry (below right) confirms.

**AUGMATRIX™**

**Vitoss**

PMMA histology with methylene blue, basic fushin stains. Typical histomorphometry outputs.

Quantitative analysis of histomorphometry outputs shows AUGMATRIX™ demonstrates significantly more bone formation in the defect compared to Vitoss at 28 days.

**Data on file. All claims based on an ovine cancellous bone defect model. It is unknown how results from this animal study relate to clinical results in humans.**
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