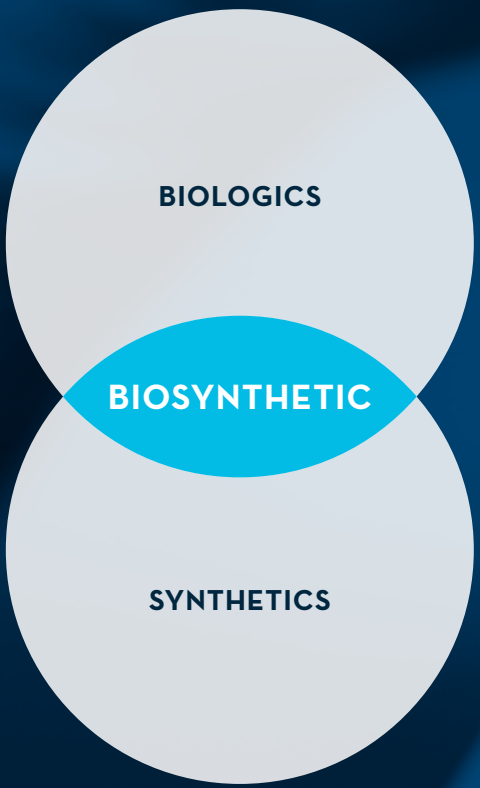
InQu®

# FASTER FUSION. **PROVEN PERFORMANCE.**

InQu® is **the cell-friendly biosynthetic™** bone graft with proven clinical efficacy leading to faster bone fusion.

isto BIOLOGICS

# DISCOVER A BETTER BONE GRAFT




InQu Bone Graft Extender & Substitute combines a biologic molecule with the consistency and cost-effectiveness of a synthetic to create a new category of bone graft: **Biosynthetic.**

## IN A **CLASS** OF ITS OWN

Discover the benefits of a biosynthetic and achieve better patient outcomes with InQu.

### Proven Efficacy

Clinically proven fusion rates of 94%, outperforming fusion rates for ICBG at 12 months[1].

### Cell-Friendly

Integrated hyaluronic acid creates a cell-friendly microenvironment, binding MSCs and growth factors[2,3].

### Faster Fusion

Shorter time to fusion vs. traditional synthetic bone grafts AND superior overall fusion rates at 12 months: 93% vs. 68%[4].

### Success in Complex Cases

Demonstrated robust fusion, even in challenging high-risk patients.

### Use with Confidence

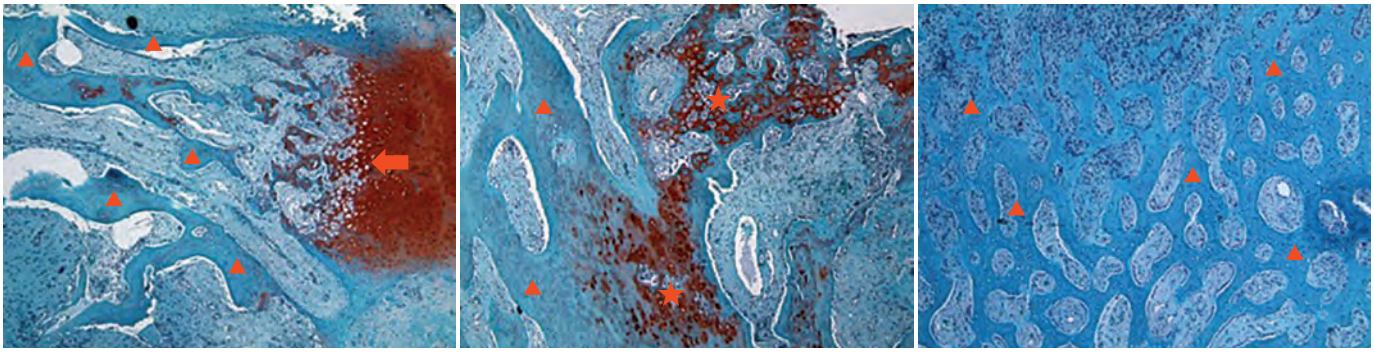
InQu offers a cost-effective, on-label solution for fusion throughout the spine.

### Exceptional Handling

A cohesive, moldable putty providing ease-of-use for a variety of applications.

# CELL-FRIENDLY GRAFT DELIVERS **BETT**

## INQU FORMS NEW BONE AT 11 WEEKS—CONFIRMED BY CLINICAL HISTOLOGY



Clinical histology demonstrates lamellar bone at 11 weeks after treatment with InQu + local bone for posterolateral lumbar fusion. Evidence of chondrogenesis, angiogenesis, and endochondral ossification confirms InQu's mechanism of bone formation (cartilage is stained red with Safranin-O). This rare clinical biopsy was taken from a 67-year-old female following revision of spinal instrumentation.

Dr. Robert Allen, Raleigh Neurosurgical, NC

⬅ ENDOCHONDRAL OSSIFICATION
★ BONE REMODELING
▲ MATURE WOVEN BONE

## INQU MIMICS THE BONE MARROW ENVIRONMENT

### Unique Formulation

InQu's composition of a resorbable polymer, **PLGA**, integrated with a biologic molecule, **hyaluronic acid**, creates a biosynthetic scaffold ideal for bone regeneration.

### Tailored Resorption Time

PLGA provides a biopolymer scaffold with a resorption profile tailored to match the rate of new bone formation.

### Rapid Cell Binding

Hyaluronic acid creates a cell-friendly microenvironment with a favorable pH, allowing InQu to bind up to 78% of MSCs within 20 minutes[5]. In contrast, ceramic-based bone grafts can take >2 hours for measurable cell binding[6].

## INQU DELIVERS **PROVEN** CLINICAL RESULTS

**4 months faster**

### Faster Fusion than β-TCP

A comparative study of InQu vs. β-TCP in PLF shows InQu promoted a higher rate of fusion at 12 months (92.9% InQu vs. 67.9% β-TCP) and was almost 4 months faster to fuse than β-TCP (206 vs. 318 days)[4].

**94% fusion success**

### Outperforms ICBG

In a study of 109 single and multilevel PLIF spinal procedures, InQu demonstrated solid fusion in 94% of levels treated at 12 months. Mean time to fusion was 10 months[1].

**50,000+ patients**

### Efficacy in Broad Application

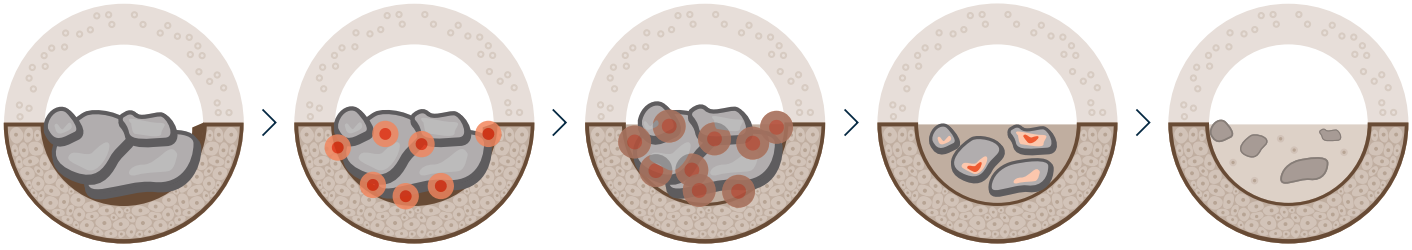
Demonstrated clinically effective with excellent safety profile for broad applications, including nonunion, fracture fixation, Charcot reconstruction, and spinal fusion[1, 4, 9, 10].

# ER PATIENT OUTCOMES

## A FASTER PATH TO HEALING

InQu partners with the body's natural processes to form bone in a shorter period of time without inciting an immune response. In contrast, traditional synthetics rely on inflammation and recruitment of specialized cells to digest the mineral scaffold before new bone formation can begin.

### CREEPING SUBSTITUTION—TRADITIONAL SYNTHETICS[7]



Traditional synthetic graft (mineral component)

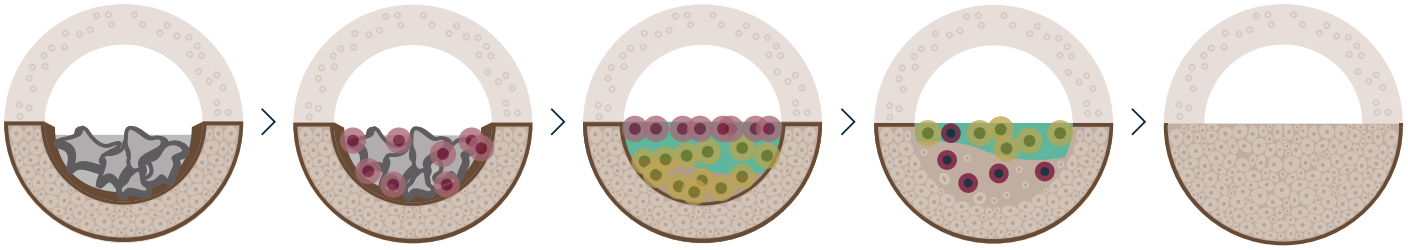
Graft breakdown triggers inflammation & may damage healthy tissue

Specialized cells respond & begin to digest minerals

Mineral deposits persist as new bone begins to form

Newly woven bone forms **over a long period of time**

### ENDOCHONDRAL BONE FORMATION—INQU[8]



InQu + Autograft (no mineral component)

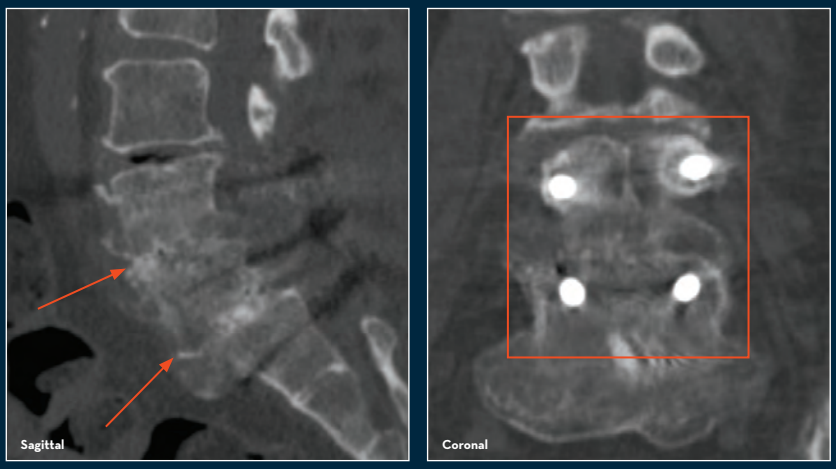
Hyaluronic acid promotes MSC binding to InQu

MSCs differentiate & cartilage intermediate forms

Cartilage ossifies & is remodeled to form bone

Mature woven bone after **9 months**

### INQU DEMONSTRATES ROBUST FUSION IN CHALLENGING PATIENT




- Patient: 59-year-old female, BMI 39.3
- Co-Morbidities: 23-year diabetic, previous smoker, hypertension & asthma
- Treatment: L4/5 & L5/S1 TLIF with InQu
- Outcome: solid fusion at 9 months, ODI score reduction from 84 to 50

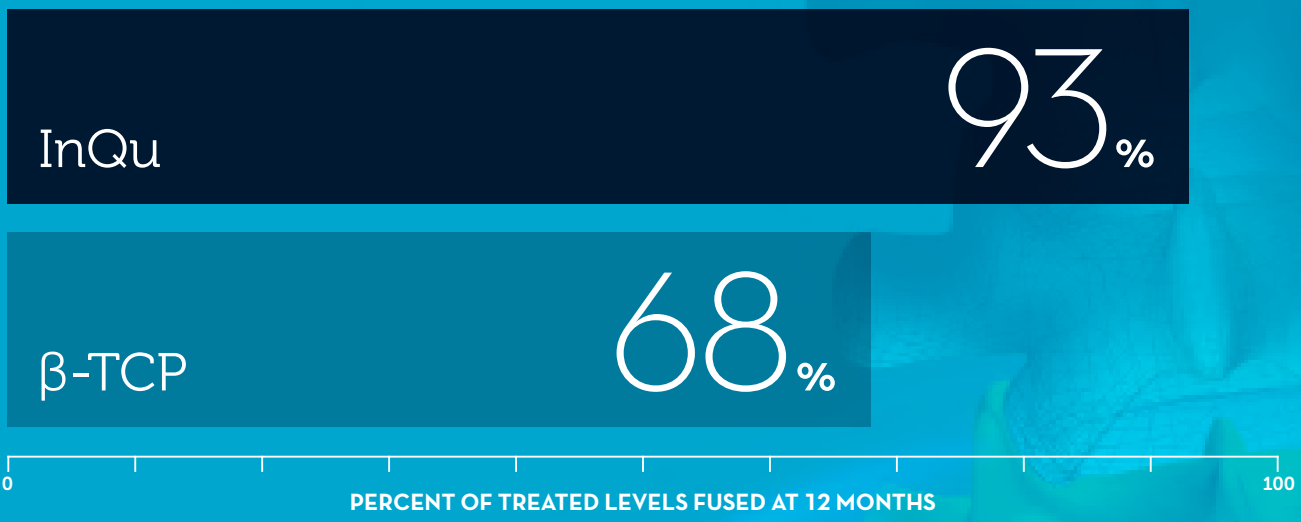
Dr. Michael Steinmetz, Cleveland Clinic, OH

*"InQu Bone Graft Extender is a great choice for my fusions because it's a cell-friendly scaffold that binds growth factors and accelerates robust bone formation"*

— Christopher P. Silveri, M.D.
Orthopedic Surgeon

# **SUPERIOR** FUSION vs. β-TCP[4]

**InQu demonstrated superior overall fusion rates by 12 months vs. β-TCP.**




## INQU SUPPORTS RAPID BONE CONSOLIDATION AND IMPROVED RESORPTION COMPARED TO β-TCP


**FUSION STUDIED SIDE-BY-SIDE IN 27 SUBJECTS**

By 6 months:
(1) **Greater volume of new bone** consolidation was observed for **InQu**-treated side.
(2) **β-TCP** showed significant graft resorption and **limited bone formation.**

INQU + BMA + AUTOGRAFT
β-TCP + BMA + AUTOGRAFT

# 112 days faster

- Median time to fusion was 206 days for InQu vs. 318 days for β-TCP.
- InQu-treated levels emerged with statistically significant higher fusion grades compared to β-TCP by day 109.

# InQu®

BONE GRAFT
EXTENDER & SUBSTITUTE

## ACHIEVE **SUPERIOR FUSION** WITH INQU

### Proven Efficacy
Clinically proven fusion rates of 94%, outperforming fusion rates for ICBG at 12 months[1].

### Faster Fusion
Shorter time to fusion vs. traditional synthetic bone grafts AND superior overall fusion rates at 12 months: 93% vs. 68%[4].

### Use with Confidence
InQu offers a cost-effective, on-label solution for fusion throughout the spine.

### Cell-Friendly
Integrated hyaluronic acid creates a cell-friendly microenvironment, binding MSCs and growth factors[2,3].

### Success in Complex Cases
Demonstrated robust fusion, even in challenging high-risk patients.

### Exceptional Handling
A cohesive, moldable putty providing ease-of-use for a variety of applications.

## EXCELLENT HANDLING IN THREE CONFIGURATIONS

**InQu PASTE MIX PLUS**
Cohesive putty available in 2.5cc, 5cc and 10cc sizes.

**InQu MATRIX**
Available as 5x5cm and 5x10cm moldable strips.

**InQu GRANULES**
Available in 30cc as a graft extender.

## Schedule a case with your Isto sales representative or customer service at 888.705.ISTO.


**References**

**1.** Chedid MK, Tundo KM, Block JM, Muir JM. **Hybrid biosynthetic autograft extender for use in posterior lumbar interbody fusion: safety and clinical effectiveness.** *Open Orthop J.* 2015;9:218-225. doi: 10.2174/1874325001509010194. • **2.** Solchaga LA, Dennis JE, Goldberg VM, Kaplan AI. **Hyaluronic acid-based polymers as cell carriers for tissue-engineered repair of bone and cartilage.** *J Orthop Res.* 1999;17:205-213. doi: 10.1002/jbm.10011. • **3.** Kim HD, Valentini RF. **Retention and activity of BMP-2 in hyaluronic acid-based scaffolds *in vitro*.** *J Biomed Mater Res.* 2002;59(3): 573-84. doi: 10.1002/jbm.10011. • **4.** Stewart G, Gage GB, Neidert G, Adkisson HD IV. **Within patient radiological comparative analysis of the performance of two bone graft extenders utilized in posterolateral lumbar fusion: a retrospective case series.** *Front Surg.* 2016;2(69). doi: 10.3389/fsurg.2015.00069. • **5.** Grande D; North Shore Hospital. ***In vitro* cell binding assay results**; unpublished, independent data. • **6.** Hsu EL, Ghodasra JH, Ashtekar A, et al. **A comparative evaluation of factors influencing osteoinductivity among scaffolds designed for bone regeneration.** *Tissue Eng Part A.* 2013;19(15-16):1764-1771. doi: 10.1089/ten.TEA.2012.0711. • **7.** Bohner M. **Siliconsubstituted calcium phosphates - a critical review.** *Biomaterials.* 2009;30(32):6403-6406. doi: 10.1016/j.biomaterials.2009.08.007. **8.** Walsh WR, Oliver RA, Gage G, et al. **Application of resorbable poly(lactide-co-glycolide) with entangled hyaluronic acid as an autograft extender for posterolateral intertransverse lumbar fusions in rabbits.** *Tissue Eng Part A.* 2011;17(1-2):213-220. doi: 10.1089/ten.TEA.2010.0008. • **9.** Harris TE. **Treatment of long bone fractures and nonunion using InQu Bone Graft Extender & Substitute.** • **10.** Kerzner, MS. **A radiographic and clinical retrospective case series of high risk foot & ankle procedures (Charcot reconstruction) using InQu Bone Graft Substitute.**


isto BIOLOGICS


45 South Street • Hopkinton, MA 01748




istobiologics.com


AMS98173LBL Rev 3