

Supporting Information

Controllable protein delivery from coated surgical sutures

Jae Sung Lee,^a Yan Lu,^b Geoffrey S. Baer,^c Mark D. Markel,^b William L. Murphy^{a,c,d,e*}

^a *Department of Biomedical Engineering, University of Wisconsin, Madison WI 53706*

^b *Comparative Orthopaedic Research Laboratory, Departments of Medical Sciences, School of Veterinary Medicine, University of Wisconsin, Madison, WI 53706*

^c *Department of Orthopedics & Rehabilitation, University of Wisconsin, Madison WI 53792*

^d *Materials Science Program, University of Wisconsin, Madison WI 53706*

^e *Department of Pharmacology, University of Wisconsin, Madison WI 53706*

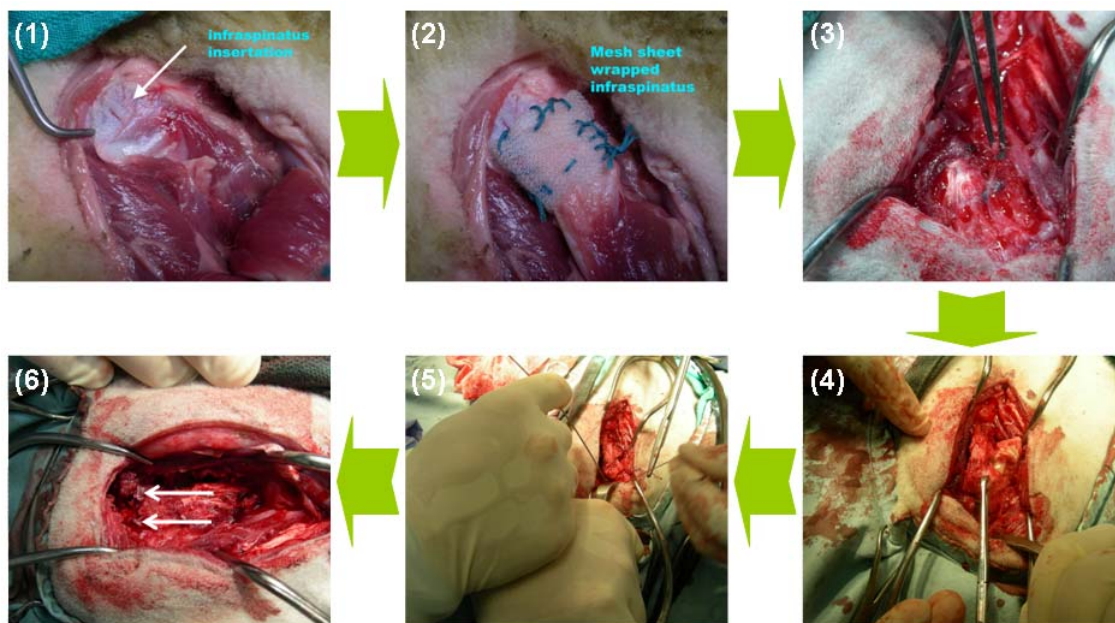


Figure S1. Surgical procedure for chronic rotator cuff repair in sheep model. (1) Infraspinatus tendon was detached from humerus. (2) Detached infraspinatus was wrapped with Polypro mesh and closed. (3) After 4 weeks, wrapped infraspinatus was exposed. (4) Polypro mesh was removed. (5) Two bone tunnels were drilled. (6) Infracinatus tendon was tied to the bone with Orthocord sutures through bone tunnels.

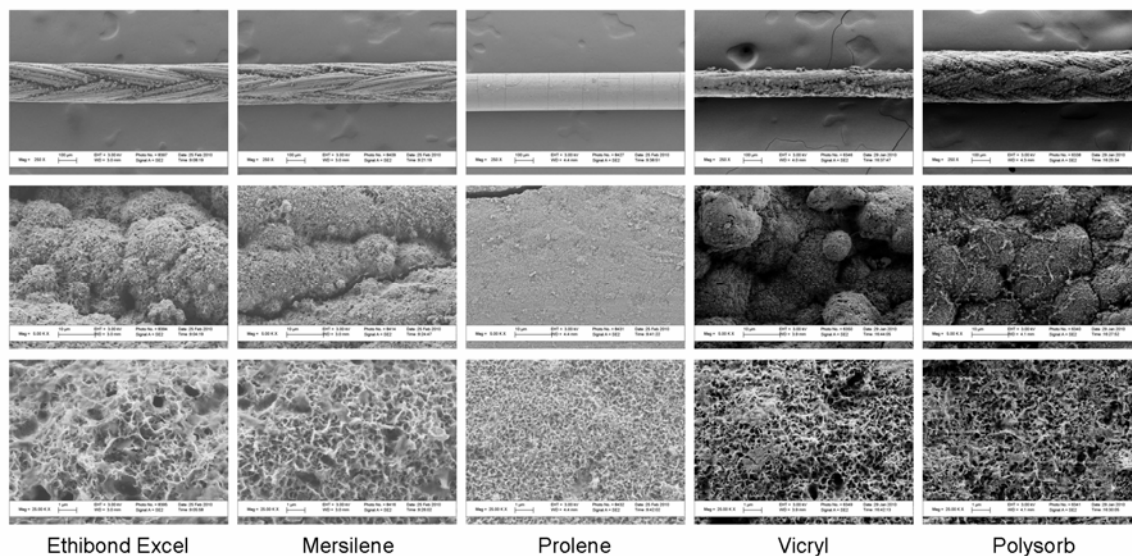


Figure S2. Formation of CaP coatings on various suture materials. CaP coatings were created by incubating in mSBF for 7 days. Ethibond Excel and Mersilene are made of poly(ethylene terephthalate), and Prolene is from polypropylene. Vicryl and Polysorb are poly(lactide-co-glycolide) sutures.

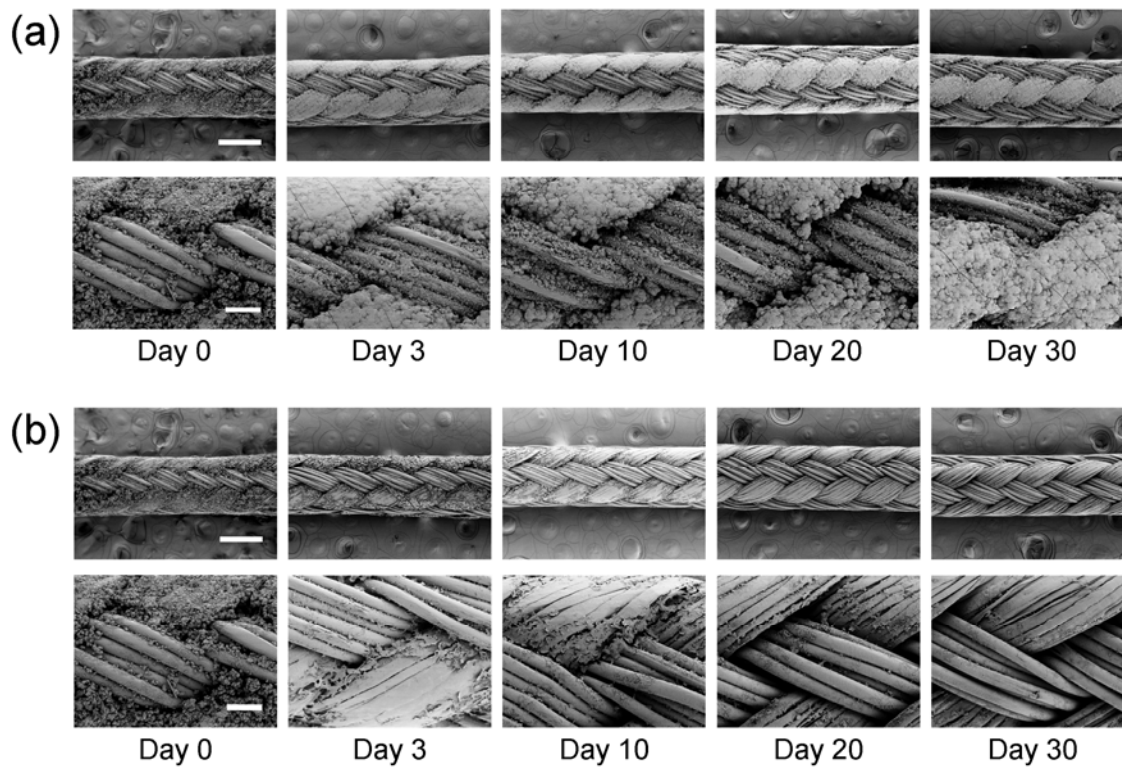


Figure S3. SEM micrographs of CaP-coated Orthocord after incubating at pH 7.4 and pH 4.0 for indicated time frame.

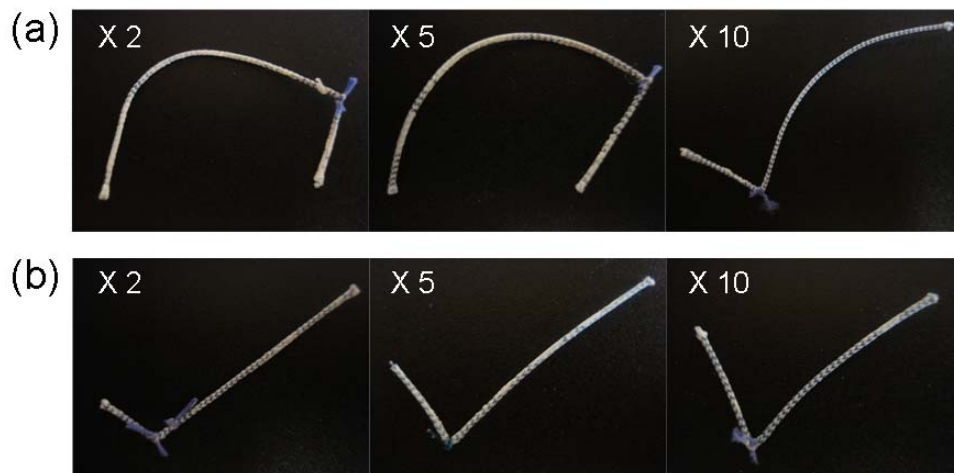


Figure S4. Photographs of CaP-coated Orthocord after multiple passages through infraspinatus tendon (a) and meniscus (b).

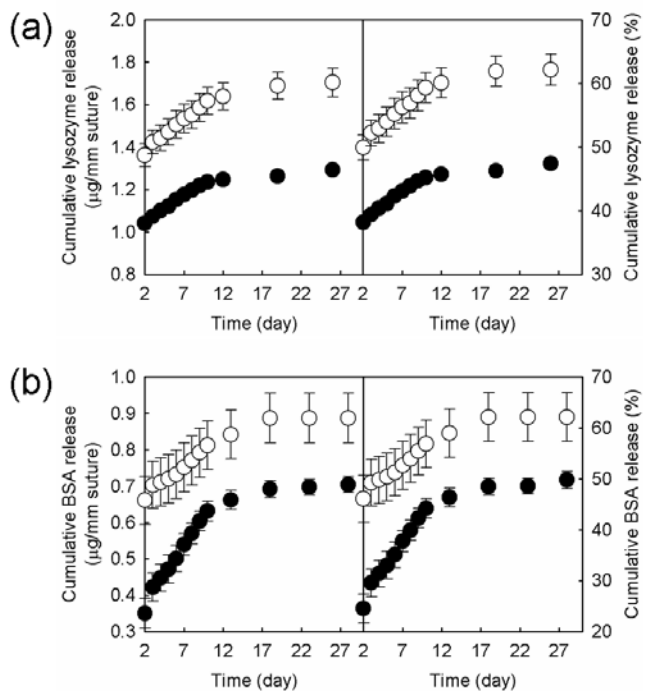


Figure S5. Cumulative protein release of protein from CaP-coated Orthocord sutures prepared using mSBF with 4.2 mM carbonate. This figure reproduced from Fig. 3 presents the release profile after first day of release.

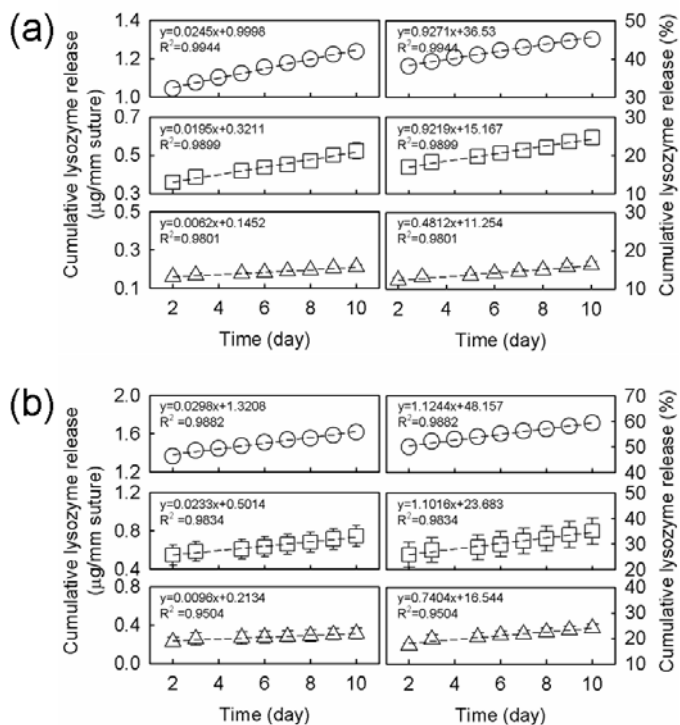


Figure S6. Cumulative release of lysozyme from CaP-coated Orthocord sutures prepared using mSBF having different carbonate concentrations; 4.2 mM (○), 25 mM (□), and 50 mM (△). Protein and calcium release were assessed at pH 7.4 (a) and pH 4.0 (b) after CaP-coated Orthocord sutures were incubated with lysozyme. This figure reproduced from the Fig. 4 shows the release of day 2 ~ 10 with the same magnitude of y-axis.