

## Protecting, Repairing, and Regenerating Articular Cartilage and Fibrocartilaginous Tissues

The invention provides methods for the protection, repair and regeneration of articular cartilage, and fibrocartilaginous tissues using recombinant parathyroid hormones, such the FDA approved biologic agent – teriparatide (Forteo®, Eli Lilly).

### Problem Solved by This Technology

Currently, the only treatments for cartilage degeneration and osteoarthritis (OA) involve palliation focused on pain management and joint replacement. The longstanding inability to develop a disease-modifying therapy that can rejuvenate joint cartilage is a great unmet need considering the high prevalence of OA nationally (>25% of the US population by 2020) and globally.

### Applications

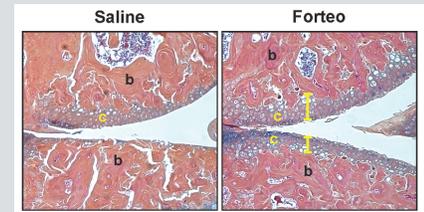
The current invention represents the first and only disease modifying treatment to date that protects against cartilage degradation and regenerates cartilage that has been lost as a result of joint injury or OA. Using a mouse model of posttraumatic OA, the inventors have demonstrated that one month of daily injections of Forteo® prevents progressive articular cartilage loss while inducing chondroregeneration. Specifically, Forteo® stimulates articular cartilage thickening via an induction of cartilage matrix production by cartilage cells. Clinical trials of Forteo® as a cartilage-regenerating therapy in humans have been planned.

### Publications

Sampson ER, et al. (2011) Teriparatide as a chondroregenerative therapy for injury-induced osteoarthritis. [Sci Transl Med. 2011 Sep 21;3\(101\)](#).

This discovery was featured in the [NIH/NIAMS Spotlight on Research in 2012](#).

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6-1753



*Forteo® induces chondroregeneration. Eight weeks after meniscal knee injury, mice received 4 weeks of daily systemic treatment with saline or Forteo®. Representative histology after 4 weeks of treatment depicts the chondroregeneration, denoted by the greater thickness (yellow bars) of Alcian Blue-stained cartilage in the Forteo®-treated group (c = cartilage, b = bone).*

### Inventors

Randy Rosier, M.D., Ph.D.  
Michael Zuscik, Ph.D.  
Edward Puzas, Ph.D.  
Eric Sampson, Ph.D.  
Susan Bukata  
Hani Awad, Ph.D.

### Intellectual Property Status

U.S. Patent [8,513,193](#), "Protecting and Repairing Cartilage and Musculoskeletal Soft Tissues" issued 20 August 2013.

U.S. Patent [9,192,653](#), "Protecting and Repairing Cartilage and Musculoskeletal Soft Tissues" issued 24 November 2015.

### For More Information, Contact

Weimin Kaufman, Ph.D., MBA -  
Licensing Manager  
e: [weimin.kaufman@rochester.edu](mailto:weimin.kaufman@rochester.edu)  
t: 585.276.6608