

CURRICULUM VITAE

Young-tae Kim, Ph.D.

Assistant Professor
 Department of Bioengineering
 University of Texas at Arlington, Arlington, TX 76019
 Phone: (817) 272-0833
 E-mail: ykim@uta.edu

ACTIVE RESEARCH AREAS:

- Biomimetic corneal stroma using a novel nanofiber-based scaffold
- Host-derived thick, pre-vascularized bioengineered cardiac graft for heart repair
- Central nervous system regeneration and neuroprotection based on novel growth factor/drug-encapsulated polymer particles (polyketal) for neurodegenerative disease treatment
- Focal delivery of neuroinflammation-related molecules to neuronal network using an innovative MEMS
- Neural tissue engineering

EDUCATION:

Doctor of Philosophy, 2004, Bioengineering, University of Utah, Salt Lake City, Utah, Advisor: Dr. Patrick A. Tresco
 Bachelor of Science, 1999, Biomedical Engineering, Yonsei University, Korea (R.O.K)
 Exchange student, 1997-1998, Bioengineering, University of California at San Diego, La Jolla, CA

TECHNICAL EXPERTISE:

Animal surgery, animal behavioral examination, immunohistochemistry, implant design and fabrication, western blot analysis, primary cell isolation and culture, LabVIEW, MATLAB, Visualization Toolkit (3D software)

WORK HISTORY AND AWARDS:

2007 - Present Assistant Professor, Bioengineering, University of Texas at Arlington, Arlington
 2004 - 2007 Post-doctoral Research Associate, Georgia Institute of Technology, Atlanta
 2003 Student Travel and Professional Development Award, The Society for Biomaterials 29th Annual Meeting, Reno, Nevada
 2003 Graduate Travel Award, University of Utah, Salt Lake City, UT
 2002 Student Travel and Professional Development Award, The Society for Biomaterials 28th Annual Meeting, Tampa, Florida
 2002 Graduate Travel Award, University of Utah, Salt Lake City, UT
 1999 -2004 Graduate Research Assistant, Department of Bioengineering, W. M. Keck Center for Tissue Engineering, University of Utah, Salt Lake City, UT.
 1997- 1998 Undergraduate Research Assistant, Non-invasive vascular Laboratory, V.A. Hospital, La Jolla, CA

PATENT AND INVENTION DISCLOSURE:

Patent pending (2005 - Present): Nanofilament scaffold for tissue regeneration (U.S. Provisional Application No. 60/659,218)

Invention disclosure (2006): Regenerative scaffold with integrated electrode array for high resolution nerve interfacing

TEACHING:

BE (5101, Fall 2007): Bioengineering seminar

BE (5300-012, Spring 2008): Neural Engineering

Course description: Neural engineering is one of the most quickly emerging interdisciplinary fields in bioengineering. Neural engineering research typically involves the use of engineering based techniques to understand and manipulate the function of the central or peripheral nervous systems. This course consists of both lecture/discussion and laboratory components. In the lecture/discussion portion of the course, the following topics will be discussed: 1) CNS/PNS injury and regeneration, 2) nerve/machine interfacing (neuroprosthetics), 3) primary culture of neural cells, 4) neuroinflammation and neurodegenerative disease, and 5) animal surgery (brain, spinal cord, and peripheral nerve). In the laboratory portion of the course, students will have opportunities to experience the following essential neural engineering techniques: 1) Embryonic and neonatal rat derived neuronal culturing, 2) immunostaining and quantitative analysis, 3) dorsal root ganglion/Schwann cell culturing, 4) neonatal rat derived astrocyte and microglia culture, and 5) animal surgical techniques, including brain, laminectomy (spinal cord), and sciatic nerve injury/implant.

JOURNAL PUBLICATIONS:

Y.T. Kim, V.K. Haftel, S. Kumar and R.V. Bellamkonda. "Aligned polymer fiber-based constructs enable bridging of long peripheral nerve gaps." Under review, *Nature Biotechnology* (2007)

Y.T. Kim, M.J. Bridge and P.A. Tresco. "The Influence of Transplanted Fibroblasts on Soluble Factor Diffusion in Adjacent Brain Tissue." *Journal of Controlled Release*, Apr 23;118(3):340-7, 2007

S.A. Chvatal*, Y.T. Kim*, A. Bratt-Leal and R.V. Bellamkonda. "Nanoparticle-Mediated Topical Delivery of Methylprednisolone after Contusion Injury to the Spinal Cord." Under revision, *Biomaterials* (2007)

* These two authors contributed equally to the study

J.S. Golub, Y.T. Kim, C.L. Duvall, R.V. Bellamkonda, W.R. Taylor, R.E. Guldborg. "PLGA nanoparticle encapsulated VEGF for therapeutic angiogenesis." Submitted to *Arteriosclerosis, Thrombosis, and Vascular Biology* (2007)

A. Jain, Y.T. Kim, R.J. McKeon and R.V. Bellamkonda. "In situ gelling hydrogels for conformational repair of spinal cord defects, and local delivery of BDNF after spinal cord injury." *Biomaterials*, Jan, 27 (3): 497-504, 2006

Y.T. Kim, R.W. Hitchcock, K.W. Broadhead, D.J. Messina, and P.A. Tresco. "A Cell Encapsulation Device for Studying Factor Release from Cells Transplanted in Rat Brain." *Journal of Controlled Release*, January, 102(1):101-11, 2005.

Y.T. Kim, R.W. Hitchcock, M.J. Bridge, and P.A. Tresco. "Chronic Response of Adult Rat Brain Tissue to Implants Anchored to the Skull." *Biomaterials*, May, 25 (12): 2229-2237, 2004.

ORAL PRESENTATIONS:

Y.T. Kim, V.K. Haftel, H.J. Lee, and R.V. Bellamkonda, "Delivery of biodegradable calpeptin-nanoparticles significantly protect neurons from injury related death after spinal cord injury", Society for Neuroscience 36th annual meeting, Atlanta, GA (2006)

Y.T. Kim and R.V. Bellamkonda, "Nanotechnology enabled regeneration of peripheral and central nerves." BMES 2005 Annual meeting, Baltimore, Maryland (2005)

Y.T. Kim, S. Kumar and R.V. Bellamkonda, "Novel Anisotropic Nanofilament-based Scaffolds for Promoting Regeneration Across Long Peripheral Nerve Gap". 8th Annual meeting of Tissue Engineering Society International, Shanghai, P.R. China (2005)

Y.T. Kim, C.J. Underwood and P.A. Tresco. "Encapsulated transplanted fibroblasts increase brain tissue reactivity in adjacent parenchyma." Annual meeting of the Society for Biomaterials, **26**: 76 (2003).

Y.T. Kim, K.W. Broadhead, D.J. Messina, and P.A. Tresco. "Reversible delivery of cell derived soluble factors to brain tissue using a refillable cell encapsulation device." Annual meeting of the Society for Biomaterials, **25**: 114 (2002).

ABSTRACTS, POSTERS, AND PROCEEDINGS:

I. Clements, Y.T. Kim, and R. V. Bellamkonda, "Optimizing surface area of aligned nanofiber based 3D scaffolds for peripheral nerve regeneration", BMES 2007 Annual meeting, LA, CA (2007)

S.A. Chvatal*, Y.T. Kim*, A. Bratt-Leal and R.V. Bellamkonda. "Nanoparticle-mediated Topical Delivery of Methylprednisolone after Contusion Injury to the Spinal Cord." Submitted to Society for Biomaterials 2007 Annual meeting

* These two authors contributed equally to the study

Y.T. Kim, V.K. Haftel, H.J. Lee, and R.V. Bellamkonda, "Delivery of biodegradable calpeptin-nanoparticles significantly protect neurons from injury related death after spinal cord injury", Society for Neuroscience 36th annual meeting, Atlanta, GA (2006)

J. Hopson, Y.T. Kim, and V.K. Haftel, "Nanoparticle delivery of insulin may be used to treat proprioceptor deficits found in diabetic rats", Society for Neuroscience 36th annual meeting, Atlanta, GA (2006)

O. Henriquez, J.Q. Smith, W. Abdelkafy, J.S. Golub, Y.T. Kim, M Rojas, K.L. Brigham, R.V. Bellamkonda, and M.M Johns, "Slow-release nanoparticle encapsulated delivery system for

- laryngeal injection”, Submitted for presentation to the American Laryngological Society at COSM. San Diego, CA (2007)
- Y.T. Kim and R.V. Bellamkonda, “Nanotechnology enabled regeneration of peripheral and central nerves”, BMES 2005 Annual meeting, Baltimore, Maryland (2005)
- Y.T. Kim, S. Kumar, and R.V. Bellamkonda, “Novel Anisotropic Nanofilament-based Scaffolds for Promoting Regeneration across Long Peripheral Nerve Gap”. 8th Annual meeting of Tissue Engineering Society International, Shanghai, P.R. China (2005)
- Y.T. Kim, J.M. Caldwell, and R.V. Bellamkonda, “Local delivery of nanoparticle encapsulated Methylprednisolone significantly protects neurons from injury related death after spinal cord injury.” Society for Neuroscience 35th annual meeting, Washington, DC (2005)
- H. Shen, Y.T. Kim, R. Bellamkonda, and S. Kumar, “Aligned Biodegradable Poly(lactide-*co*-glycolide) (PLGA) Nano/Micro Filaments for Guided Neurite Extension.” American chemical society 231st National meeting and exposition, Atlanta, GA (2006)
- H. Shen, Y.T. Kim, S. Kumar, and R. Bellamkonda, “Aligned Biodegradable Polymer Nano/Micro Filaments for Guided Neurite Extension.” Society for Biomaterials Annual meeting and Exposition, PA (2006)
- Y.T. Kim and R. Bellamkonda, “Novel anisotropic nanofilament-based scaffolds for nerve regeneration.” 9th Annual Hilton Head Workshop, Hilton Head, SC (2005)
- D.R. Merrill, B.D. Winslow, Y.T. Kim, C.J. Underwood, and P.A. Tresco, “A novel tool for characterizing temporal changes at the biosensor-brain tissue interface.” Annual meeting of the Society for Neuroscience, San Diego, CA (2004).
- Y.T. Kim, M.J. Bridge, C.J. Underwood, and P.A. Tresco. “Brain reactivity to transplanted fibroblasts decreases bioavailability of small molecules in adjacent tissue.” Annual meeting of the Society for Neuroscience, New Orleans, LA (2003).
- Y.T. Kim, C.J. Underwood, and P.A. Tresco. “Encapsulated transplanted fibroblasts increase brain tissue reactivity in adjacent parenchyma.” Transactions of the 29th Society for Biomaterials, 76 (2003).
- Y.T. Kim, K.W. Broadhead, D.J. Messina, and P.A. Tresco. “Reversible delivery of cell derived soluble factors to brain tissue using a refillable cell encapsulation device.” Annual meeting of the Society for Neuroscience, Orlando, FA (2002).
- M.J. Bridge, K.W. Broadhead, Y.T. Kim, D.J. Messina, and P.A. Tresco. “Estimating the diffusive properties of an implanted cell encapsulation membrane and the adjacent tissue within adult brain tissue.” Transactions of the 28th Society for Biomaterials, 283 (2002).
- Y.T. Kim, N. Zhang, M.E Manwaring, R. Biran, and P.A. Tresco. “Adult rat brain tissue reactivity is enhanced by biomaterials that chronically traverse the leptomeninges.” Transactions of the 27th Society for Biomaterials, (2001).

D.J. Messina, R.W. Hitchcock, N. Zhang, Y.T. Kim, M.J. Bridge, C.J. Underwood, and P.A. Tresco. "The influence of cell-derived soluble factors on host tissue remodeling." Route 28 summits in Neurobiology, The Id of Stem cells, Port Ludlow, WA (2001).

C.J. Underwood, N. Zhang, Y.T. Kim, R.W. Hitchcock, M.J. Bridge, R. Biran, and P.A. Tresco. "CNS reactivity to implanted biomaterials is suppressed by soluble factors derived from co-implanted young astrocytes." Annual meeting of the Society for Neuroscience, San Diego, CA (2001).

G. Clark, R. Smeal, Y.T. Kim, M. Lehmkuhle, B. Leung, M. Manwaring, S. Manyam, M. Palfreyman, X. Wen, and N. Zhang. "Neural interfaces laboratory II. Selective activation of small-diameter axons in frog sciatic nerve." Annual meeting of the Society for Neuroscience, San Diego, CA (2001).

PROFESSIONAL AFFILIATIONS:

Member - Society for Neuroscience