

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel in the order listed for Form Page 2.  
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	POSITION TITLE		
<b>YOKOTA, Hiroki, Ph.D.</b>	Associate Professor of Biomedical Engineering Associate Professor of Anatomy and Cell Biology		
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of Tokyo, Japan	B.S.	1978	Aeronautics and Astronautics
University of Tokyo, Japan	M.S.	1980	Astronautics
University of Tokyo, Japan	Ph.D.	1983	Astronautics
Indiana University, Bloomington, IN	Ph.D.	1993	Molecular, Cellular and Developmental Biology
University of Washington, School of Medicine, Seattle, WA	postdoctoral	1993-1998	Molecular Biotechnology

**A. Positions and Honors****Professional Experience**

1983-1988	Research Assistant Professor, Institute of Space and Astronautical Sciences, Japan
1985	Engineer, Solar Terrestrial Physics Project, Goddard Space Flight Center, NASA, MD
1989-1993	Associate Instructor, Department of Biology, Indiana University, Bloomington, IN
1993-1998	Senior Fellow, Department of Molecular Biotechnology, University of Washington, Seattle, WA
1998-2004	Assistant Professor of Biomedical Engineering, Mechanical Engineering, and Anatomy and Cell Biology, Indiana University - Purdue University Indianapolis, Indianapolis, IN
2000-2004	Assistant Professor of Biomedical Engineering, Purdue University, West Lafayette, IN
2004-present	Associate Professor of Biomedical Engineering, Mechanical Engineering, and Anatomy and Cell Biology, Indiana University - Purdue University Indianapolis, Indianapolis, IN
2004-present	Associate Professor of Biomedical Engineering, Purdue University, West Lafayette, IN

**Professional Activities**

2000	Ad hoc member, Israeli NSF review (bioengineering)
2003	Ad hoc member, NIH study section - ZRG1 SSS-M (58)
2004	Ad hoc member, NIH study section - ZEB1 OSR-B (O1) (S)
2004-present	Member, Awards Committee, Biomedical Engineering Society
2004-present	Associate Editor, Systems Biology, Institute of Electrical Engineers
2004-present	Member, Editorial Board, Biological Sciences in Space

Member American Association for the Advancement of Science; American Society for Bone and Mineral Research; American Society for Engineering Education; American Society of Mechanical Engineers; Biomedical Engineering Society; Orthopaedic Research Society

Courses Biomolecular Engineering; Advanced Biomolecular Engineering; Molecular and Cellular Biomechanics; Principles of Biomedical Engineering I

**Honor**

2004 Abraham M. Max Distinguished Professor Award for outstanding research, IUPUI

**B. Selected Peer-Reviewed Publications (last 6 years)**

- Yokota, H.**, Fung, K., Trask, B.J., van den Engh, G., Sarikaya, M., and Aebersold, R. (1999). Sharp DNA bends as landmarks of protein-binding sites on straightened DNA. *Anal. Chem.* 71:1663-1667.
- Yokota, H.**, Sunwoo, J., van den Engh, G., Sarikaya, M., and Aebersold, R. (1999). Spin-stretching of DNA and protein molecules for detection by fluorescence and atomic force microscopy. *Anal. Chem.* 71:4418-4422.
- Sun, H.B., and **Yokota, H.** (1999). Correlated positioning of homologous chromosomes in daughter fibroblast cells. *Chromosome Research* 7:603-610.
- Sun, H.B., Shen, J., and **Yokota, H.** (2000). Size-dependent positioning of human chromosomes in interphase nuclei. *Biophysical J.* 79:184-190.
- Sun, H.B., and **Yokota, H.** (2000). MutS-mediated detection of DNA mismatches using atomic force microscopy. *Anal. Chem.* 72:3138-3141.
- Sun, H.B., Smith Jr., G.N., Hasty, K.A., and **Yokota, H.** (2000). Atomic force microscopy-based detection of binding and cleavage site of matrix metalloproteinase on individual type II collagen helices. *Anal. Biochem.* 283:153-158.
- Sun, H.B., **Yokota, H.**, Chi, X.X., Xu, Z.C. (2000). Differential expression of neurexin mRNA in CA1 and CA3 hippocampal neurons in response to ischemic insult. *Molecular Brain Research* 84:146-149.
- Yokota, H.**, Sun, H.B., and Malacinski, G.M. (2000). Future opportunities for life science programs in space. *Korean J. Biol. Sci.* 4:239-243.
- Sun, H.B., and **Yokota, H.** (2001). Altered mRNA levels of matrix metalloproteinase 13 in MH7A synovial cells by mechanical loading and unloading. *Bone* 28:399-403.
- Sun, H.B., and **Yokota, H.** (2001). Messenger RNA expression of matrix metalloproteinases, tissue inhibitors of metalloproteinases, and transcription factors in rheumatic synovial cells under mechanical stimuli. *Bone* 28:303-309.
- Sun, H.B., Qian, L., **Yokota, H.** (2001). Detection of abasic sites on individual DNA molecules using atomic force microscopy. *Anal. Chem.* 73:2229-2232.
- Sun, H.B., and **Yokota, H.** (2002). Suppression of cytokine-induced expression and activities of MMP-1 and MMP-13 by mechanical strain in MH7A rheumatoid synovial cells. *Matrix Biology* 21:263-270.
- Qian, L., Liu, Y., Sun, H.B., and **Yokota, H.** (2002). Systems analysis of matrix metalloproteinase mRNA expression in skeletal tissues. *Frontiers in Bioscience* 7:a126-134.
- Sun, H.B., Malacinski, G.M., and **Yokota, H.** (2002). Promoter competition assay for analyzing gene regulation in joint tissue engineering. *Frontiers in Bioscience* 7:a169-174.
- Yokota, H.**, Goldring, M.B., and Sun, H.B. (2003). CITED2-mediated regulation of MMP-1 and MMP-13 in human chondrocytes under flow shear. *J. Biol. Chem.* 278:47275-47280.
- Sun, H.B., Liu, Y., Qian, L., and **Yokota, H.** (2003). Model-based analysis of matrix metalloproteinases expression under mechanical shear. *Annals of Biomed. Eng.* 31:171-180.
- Tanaka, S.M., Li, J., Duncan, R.L., **Yokota, H.**, Burr, D.B., and Turner, C.H. (2003). Effects of broad frequency vibration on cultured osteoblasts. *J. Biomech.* 36:73-80.
- Sun, H.B., Nalim, R., and **Yokota, H.** (2003). Expression and activities of matrix metalloproteinases under oscillatory shear in IL-1-stimulated synovial cells. *Connective Tissue Res.* 44:42-49.
- Sun, I., Liu, Y., Tanaka, S.M., Lee, C.W., Sun, H.B., and **Yokota, H.** (2004). Effects of high-impact mechanical loading on synovial cell cultures. *J. Sports Sci. Med.* 3:37-43.
- Tanaka, S.M., Sun, H.B., and **Yokota, H.** (2004). Bone formation induced by a novel form of mechanical loading on joint tissue. *Biol. Sci. Space* 18:41-44.
- Nalim, R., Pekkan, K., Sun, H.B., and **Yokota, H.** (2004). Oscillating Couette flow for *in vitro* cell loading. *J. Biomech.* 37:939-942.
- Liu, Y., and **Yokota, H.** (2004). Modelling and identification of transcription-factor binding motifs in human chondrogenesis. *Systems Biology* 1:85-92.

**C. Extramural Research Support****Ongoing Support**

R01AR50008 Yokota (PI) 04/15/04 – 03/31/08

NIH/NIAMS

Mechanical Response of Osteoblasts in 3D Matrix

The objective of this project is to investigate the molecular and cellular responses of osteoblasts in 3-dimensional collagen matrix under load-induced fluid flow.

R01EB001019 Yokota (PI) 09/01/02 – 08/31/05

NIH/NIBIB

Mechanical Loading and Matrix Metalloproteinase

The objective of this project is to develop a high-resolution piezoelectric mechanical loader for investigating load-induced expression of a family of matrix metalloproteinase genes.

R21RR17012 Yokota (PI) 05/10/02 – 04/30/05

NIH/NCRR

Promoter-Based Estimation Analysis

The objective of this project is to build a mathematical model for transcriptional regulation of a family of matrix metalloproteinase genes using known transcription-factor binding motifs such as AP1, AP2, NFkB, etc.

R03AG24596 Tanaka (PI); Yokota (co-I) 09/01/04 - 08/31/06

NIH/NIA

Bone and Knee Loading

The objective of this project is to investigate the osteogenic potential of the knee-loading modality using bone histomorphometry and biomechanical tests.

Hsu (PI); Yokota (co-I) 09/01/03 – 08/31/05

Indiana 21<sup>st</sup> Century Research Fund

Multi-Scale Methodology for the Design of Active Materials

The objective of this project is to develop a multi-scale methodology and a computational model to predict the interfacial activities between substrates and surrounding liquid at nano- and meso-scales.

**Completed Support (last 2 years)**

Yokota (PI) 09/01/02 - 08/31/03

Whitaker Foundation

Piezoelectric Biomolecular/Cellular Loader

Yokota (PI) 09/01/99 - 08/31/02

Whitaker Foundation

Digital DNA Imaging Using Fluorescence and Atomic Force Microscopy

R03AR47628 Sun (PI); Yokota (co-I) 08/15/02 - 07/31/04

NIH/NIAMS

Arthritis and Physical Therapy

NSF0110854 Ben-Miled (PI); Yokota (co-I) 07/01/01 – 06/30/04

NSF

BACIIS: Biological and Chemical Integrated Information System

Datta, (PI); Yokota (co-I) 08/04/00 - 08/04/03

Indiana 21<sup>st</sup> Century Research Fund

Center for Nanoscale Electronic/Biological Devices