BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed on Form Page 2.
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NAME	POSITION TITLE
Charles H. Turner	Professor of Orthopaedic Surgery and Biomedical Engineering

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
Texas Tech University, Lubbock, TX	B.S.M.E.	1983	Mechanical Engineering
Tulane University, New Orleans, LA	Ph.D.	1987	Biomedical Engineering

A. Positions and Honors

1987-91 Assistant Professor, Department of Medicine: Creighton University, Omaha, NE
1991-97 Assistant Professor, Department of Mechanical Engineering, Joint: Purdue University, Indianapolis, IN
1991-97 Assistant Professor, Orthopaedic Surgery: Indiana University, Indianapolis, IN
1997-2001 Associate Professor, Orthopaedic Surgery: Indiana University, Indianapolis, IN
1999-2002 Associate Editor, *Journal of Biomechanical Engineering*
1991-Present Director of Orthopaedic Research, Indiana University, Indianapolis, IN
1997-Present Associate Director of Biomedical Engineering, Indiana University, Indianapolis, IN
2001-Present Professor of Orthopaedic Surgery and Biomedical Engineering, Indiana University

Professional Experience and Honors

2002 Elected Fellow in the American Institute for Medical and Biological Engineering
2001 Recipient of the Fuller Albright Award from the ASBMR
2000 Keynote speaker, Meeting on Pediatric Bone Biology; Invited speaker, American College of Sports Medicine Annual Meeting
1999 Plenary speaker, Australian and New Zealand Bone and Mineral Society; Special Consultant, FDA, Radiological Devices Panel
1998 Special Consultant, External Advisory Committee, FDA; Grant Reviewer for SBIR program (NIH); Ad Hoc Study Section (NIH); OBM2 Study Section (NIH)
1997 Special Consultant, FDA, Radiological Devices Panel; Grant Review Committee, Bioengineering Division (NSF); Keynote speaker, Japanese Orthopaedic Research Society
1996 Invited speaker, Orthopaedic Research Society Annual Meeting
1995 Invited speaker, BMES Annual Meeting; Invited speaker, International Congress of Biorheology; Ad Hoc Study Section (NIH)
1994 Invited speaker, Gordon Conference; Invited speaker, 2nd World Congress of Biomechanics
1992 Consultant, External Advisory Committee, FDA.

B. Selected peer-reviewed publications

1. Robling, A. G., D. B. Burr, **C. H. Turner** (2001) Recovery periods restore mechanosensitivity to dynamically loaded bone. *Journal of Experimental Biology* 204 (Pt 19): 3389-3399.
2. Mashiba, T, **C. H. Turner**, T. Hirano, M. R. Forwood, D. S. Jacob, C. C. Johnston, D. B. Burr (2001) The effects of high dose etidronate treatment on microdamage accumulation and biomechanical properties in beagle bone before occurrence of spontaneous fractures. *Bone* 29: 271-278.
3. **Turner, C. H.** (2002) Mechanotransduction in skeletal cells. *Current Opinion in Orthopaedics* 13: 363-367.
4. **Turner, C. H.**, A. G. Robling, R. L. Duncan, D. B. Burr (2002) Do bone cells behave like a neuronal network? *Calcified Tissue International* 70: 435-442.
5. **Turner, C. H.**, W. G. Beamer (2002) Is skeletal mechanotransduction under genetic control? *Journal of Musculoskeletal and Neuronal Interactions* 2: 237-238.

6. **Turner, C. H.** (2002) Biomechanics of bone: Determinants of skeletal fragility and bone quality. *Osteoporosis International* 13: 97-104.
7. Bass, S., L. Saxon, R. Daly, **C. H. Turner**, A. G. Robling, E. Seeman, S. Stuckey (2002) The effect of loading on the size and shape of bone in pre- and peri-pubertal girls: A study in tennis players. *Journal of Bone and Mineral Research* 17:2274-2280.
8. Ma, Y. L., H. U. Bryant, Q. Zeng, A. Palkowitz, W. S. S. Jee, **C. H. Turner**, M. Sato (2002) Long-term dosing of arzoxifene lowers cholesterol, reduces bone turnover, and preserves bone quality in ovariectomized rats. *Journal of Bone and Mineral Research* 17:2256-2264.
9. Robling, A. G., **C. H. Turner** (2002) Mechanotransduction in bone: Genetic effects on mechanosensitivity in mice. *Bone* 31: 562-569.
10. Li, J., R. L. Duncan, D. B. Burr, **C. H. Turner** (2002) L-Type calcium channels mediate mechanically induced bone formation in vivo. *Journal of Bone and Mineral Research* 17: 1795-1800.
11. Lees, C. J., T. C. Register, **C. H. Turner**, T. Wang, M. Stancill, C. P. Jerome (2002) Effects of raloxifene on bone density, biomarkers, and histomorphometric and biomechanical measures in ovariectomized cynomolgus monkeys. *Menopause* 5: 320-328.
12. Robling, A. G., F. M. Hinant, D. B. Burr, **C. H. Turner** (2002) Improved bone structure and strength after long-term mechanical loading is greatest if loading is separated into short bouts. *Journal of Bone and Mineral Research* 17: 1545-1554.
13. Sato, M., Y.L. Ma, J.M. Hock, M.S. Westmore, J. Vahle, A. Villanueva, **C. H. Turner** (2002) Skeletal efficacy with PTH in rats was not entirely beneficial with long-term treatment. *Journal of Pharmacology and Experimental Therapeutics* 302: 304-313.
14. Peacock, M., **C. H. Turner**, M. J. Econs, T. Foroud (2002) Genetics of osteoporosis. *Endocrine Reviews* 23: 303-326.
15. Li, J., D. B. Burr, **C. H. Turner** (2002) Suppression of prostaglandin synthesis with NS-398 has different effects on endocortical and periosteal bone formation induced by mechanical loading. *Calcified Tissue International* 70: 320-329.
16. Burr, D. B., A. G. Robling, **C. H. Turner** (2002) Effects of biomechanical stress on bones in animals. *Bone* 30: 781-786.
17. Bouxsein, M. L., C. J. Rosen, **C. H. Turner**, C. L. Ackert, K. L. Shultz, L. R. Donahue, G. Churchill, M. L. Adamo, D. R. Powell, R. T. Turner, R. Muller, W. G. Beamer (2002) Generation of a new congenic mouse strain to test the relationships among serum IGF-1, bone mineral density, and skeletal morphology in vivo. *Journal of Bone and Mineral Research* 17: 570-579.
18. Ohashi, N., A. G. Robling, D. B. Burr, **C. H. Turner** (2002) The effect of dynamic axial loading on the rat growth plate. *Journal of Bone and Mineral Research* 17: 284-292.
19. Robling, A. G., F. M. Hinant, D. B. Burr, **C. H. Turner** (2002) Shorter, more frequent mechanical loading sessions enhance bone mass. *Medicine and Science in Sports and Exercise* 34: 196-202.
20. Robling, A. G., J. Li, K. L. Shultz, W. G. Beamer, **C. H. Turner** (2003) Evidence for a skeletal mechanosensitivity gene on mouse Chromosome 4. *FASEB Journal* 17: 324-326.
21. Tanaka, S. M., I. Alam, **C. H. Turner** (2003) Stochastic resonance in osteogenic response to mechanical loading. *FASEB Journal* 17: 313-314.
22. Tanaka, S. M., J. Li, R. L. Duncan, H. Yokota, D. B. Burr, **C. H. Turner** (2003) Effects of broad frequency vibration on cultured osteoblasts. *Journal of Biomechanics* 36: 73-80.
23. Pavalko, F. M., S. M. Norvell, D. B. Burr, **C. H. Turner**, R. L. Duncan, J. P. Bidwell (2003) A model for mechanotransduction in bone cells: The load-bearing mechanosome. *Journal of Cellular Biochemistry* 88:104-112.
24. Ahlborg, H. G., O. Johnell, **C. H. Turner**, G. Rannevik, M. K. Karlsson (2003) Bone loss and bone size after menopause. *New England Journal of Medicine* 349: 327-334.
25. Li, J., R. L. Duncan, D. B. Burr, V. H. Gattone, **C. H. Turner** (2003) Parathyroid hormone enhances mechanically induced bone formation, possibly involving L-type voltage-sensitive calcium channels. *Endocrinology* 144: 1226-1233.
26. Koller, D. L., J. Schriefer, Q. Sun, K. L. Shultz, L. R. Donahue, C. J. Rosen, T. Foroud, W. G. Beamer, **C. H. Turner** (2003) Genetic effects for femoral biomechanics, structure, and density in C57BL/6J and C3H/HeJ inbred mouse strains. *Journal of Bone and Mineral Research* 18: 1758-1765.

C. Research Support

Current

R01 AR047822 Turner (PI) 4/01/03-3/31/08
NIH/NIAMS
"Genetic Analysis of Hip Fragility"
The goal of this project is to evaluate the genetic contributions to hip strength in rats.
Role: Principal Investigator

R01 AR047838 Burr (PI) 7/01/02-6/30/07
NIH/NIAMS
"Remodeling Suppression: Damage Accumulation and Bone Toughness
This project will determine the role of bone microdamage in bone quality
Role: Co-investigator

5 R01 AR46530-03 Turner (PI) 2/01/00-1/31/04
NIH/NIAMS
"Genetic Analysis of Vertebral Strength"
The goal of this project is to evaluate the genetic contributions to vertebral bone strength in mice.
Role: Principal Investigator

5 P01 AG18397-02 Econs (PI) 7/1/00 – 6/30/05
NIH/NIA
"Genetic Determinants of Bone Fragility"
We map genes for vertebral bone strength using an F2 cross between F344 and LEW rats.
Role: Principal Investigator (Project 3)

5 P01 AR45218-03 Burr (PI) 2/01/00 - 1/31/04
NIH/NIAMS
"Mechanotransduction in Bone"
The goal of this project is to define mechanisms by which fluid forces can regulate gene expression
Role: Principal Investigator (Core C)

2 R01 AR45433-04 Rosen(PI) 7/1/01-6/30/05
NIH/NIAMS
"Genetic Regulation of IGF-1 in Peak Bone Density of Mice"
This study will investigate the genetic influences on IGF-1 levels and their relationship to bone density and strength.
Role: Principal Investigator (subcontract)

Completed

5 R03 DE13607-02 Ridall (PI) 2/01/00-1/31/02
NIH/NIDCR
"The Regulation and Function of COX-2 in Mechanotransduction"
The goal of this project is to examine the effect of applying mechanical loads to mice deficient of the gene for COX-2 expression.
Role: Co-investigator (subcontract)

21st Century Fund 2/1/00 – 1/31/02
State of Indiana
"Minimally Invasive Orthopaedic Implant Design"
The goal of this project is to develop novel orthopaedic implants.
Role: Principal Investigator (subcontract)

21st Century Fund 4/1/01-3/31/03
State of Indiana
“Advanced Spinal Surgery Concepts”
We will develop new surgical methods to repair vertebral fractures.
Role: Principal Investigator (subcontract)