

## 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  Frederic David Shapiro, MD POSITION TITLE  Associate Professor, Orthopedic Surgery, Harvard Medical School, Boston, MA			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Toronto, Canada		1962	Pre-medical
University of Toronto, Faculty of Medicine	MD	1967	Medicine
Fellow of Royal College of Surgeons, Canada	FRCS (C)	1973	Orthopedics
American Board of Orthopaedic Surgery		1979	Orthopedics

### A. Professional Positions:

1969-1972 Orthopedic Residency Program, McGill University, Montreal, Quebec, Canada  
 1973-Present Research Fellow (1973), Research Assistant (1976), Research Associate (1981-present),  
 Orthopaedic Research Laboratory, Children's Hospital, Boston, MA  
 1976-1981 Instructor, Orthopedic Surgery, Harvard Medical School, Boston, MA  
 1981-1988 Assistant Professor, Orthopaedic Surgery, Harvard Medical School, Boston, MA  
 1988-present Associate Professor, Orthopaedic Surgery, Harvard Medical School, Boston, MA

### Awards and Other Professional Activities:

1980-1983 Clinical Investigators Award, NIH  
 1986-2002 Board of Consulting Editors for Research, Journal of Bone and Joint Surgery  
 2000-2004 Editorial Board, Calcified Tissue International  
 1993 Huene Award-Pediatric Orthopaedic Society of North America

### B. Publications (partial listing of 103 peer reviewed articles):

Shapiro F. (1985) Consequences of an osteogenesis imperfecta diagnosis for survival and ambulation. *J Pediatr Orthop* 5:456-462  
 Eyre DR, Shapiro FD, Aldridge JF (1985) A Heterozygous collagen defect in a variant of the Ehlers Danlos Syndrome Type VII. Evidence for a detected amino-telopeptide domain in the pro alpha 2(I) chain. *J Biol Chem* 260:11322-11329.  
 Eyre DR, Upton MP, Shapiro FD, Wilkinson RH, Vawter GP. (1986) Non-expression of cartilage type II collagen in a case of achondrogenesis (Langer-Saldino Variant). *Am J Hum Genet* 29:52-67.  
 Shapiro F. (1987) Epiphyseal Disorders. *Medical Progress. New Eng J Med* 317:1702-1710.  
 Hoffman EP, Fischbeck KH, Brown RH, Johnson M, Medori R, Loike JD, Harris JB, Waterston R, Brooke M, Specht L, Kupsky W, Chamberlain J, Caskey CT, Shapiro F, Kunkel LM.(1988) Characterization of dystrophin in muscle-biopsy specimens from patients with Duchenne's or Becker's muscular dystrophy. *New Eng J Med* 318:1363-1368.  
 Shapiro F.(1988) Cortical bone repair. The relationship of the lacunar-canalicular system and intercellular gap junctions to the repair process. *J Bone Joint Surg* 70A: 1067-1081.  
 Jaramillo D, Shapiro F, Hoffer FA, Winalski CS, Koskinen MF, Frasso R, Johnson A. (1990) Post traumatic growth-plate abnormalities: MR imaging of bony-bridge formation in rabbits. *Radiology* 175:767-773.  
 Shapiro F, Specht L. (1991) Orthopaedic deformities in Emery-Dreifuss muscular dystrophy. *J Pediatr Orthop* 11:336-340.  
 Shapiro F, Specht L, Korf BR. (1991) Locomotor problems in infantile facioscapulohumeral muscular dystrophy. Retrospective study of 9 patients. *Acta Orthop Scand* 62:367-371.

- Shapiro F. (1992) Light and electron microscopic abnormalities in diastrophic dysplasia growth cartilage. *Calcif Tissue Int* 51:324-331.
- Shapiro F, Sethna N, Colan S, Wohl ME, Specht L. (1992) Spinal fusion in Duchenne muscular dystrophy. A multi-disciplinary approach. *Muscle and Nerve* 15:604-614.
- Shapiro F. (1992) Vertebral development of the chick embryo during days 3-19 of incubation. *J Morph* 213:317-333.
- Shapiro F, Specht L. (1993) The diagnosis and orthopaedic treatment of inherited muscular diseases of childhood. *J Bone Joint Surg* 75A:439-454.
- Shapiro F, Koide S, Glimcher MJ. (1993) Cell origin and differentiation in the repair of full-thickness defects of articular cartilage. *J Bone Joint Surg* 75A:532-553.
- Shapiro F, Cahill C, Malatantis G, Nayak RC. (1995) Transmission electron microscopic demonstration of vimentin in rat osteoblast and osteocyte cell bodies and processes using the immunogold technique. *Anat Rec* 241:39-48.
- Jaramillo D, Villegas-Medina OL, Doty DK, Dwek JR, Ransil BJ, Mulkern RV, Shapiro F. (1996) Gadolinium-enhanced MR imaging demonstrated abduction-caused hip ischemia and its reversal in piglets. *Pediatr Radiol* 1995; 25: 578-587 and *Am J Roent* 166: 879-887.
- Gerstenfeld LC, Shapiro FD. (1996) Expression of bone-specific genes by hypertrophic chondrocytes: implications of the complex functions of the hypertrophic chondrocyte during endochondral bone development. *J Cell Biochem* 62:1-9.
- Shapiro F. (1997) Variable conformation of gap junctions linking bone cells: A transmission electron microscopic study of linear, stacked linear, curvilinear, oval and annular junctions. *Calcif Tissue Int* 61:285-293.
- Jaramillo D, Connolly SA, Mulkern RV, Shapiro F. (1998) Developing epiphysis: MR imaging characteristics and histologic correlation in the newborn lamb. *Radiology* 207:637-645.
- Kocher MS, Shapiro F. (1998) Osteogenesis imperfecta. *J Am Acad Orthop Surg* 6:225-236.
- Shapiro F. (1998) Epiphyseal and physeal cartilage vascularization: a light microscopic and tritiated-thymidine autoradiographic study of cartilage canals in newborn and young post-natal rabbit bone. *Anat Rec* 252:140-148.
- Bonnemann CG, Cox, GF, Shapiro F, Wu JJ, Feener CA, Thompson TG, Anthony DC, Eyre DR, Darras BT, Kunkel LM. (2000) A mutation in the 3 chain of type IX collagen causes autosomal dominant multiple epiphyseal dysplasia with mild myopathy. *Proc Natl Acad Sci, USA* 97:1212-1217.
- Jaramillo D, Kammen BF, Shapiro F. (2000) Cartilaginous path of physeal fracture-separations: evaluation with MR imaging – an experimental study with histologic correlation in rabbits. *Radiology* 215:504-511
- Menache CC, Brown CA, Donnelly JH, Shapiro F, Darras BT. (2000) Identification of a novel truncating mutation (S 171 X) in the emerin gene in five members of a Caucasian American family with Emery Dreifuss muscular dystrophy. *Hum Mut* 16:94.
- Rivas R, Shapiro F. (2002) Structural stages in the development of the long bones and epiphyses. A study in the New Zealand white rabbit. *J Bone Joint Surg (Am)* 84:85-100.
- Bonnemann CG, Wong J, Jones KJ, Lidov HG, Feener CA, Shapiro F, Darras BT, Kunkel LM, North KN. (2002) Primary sarcoglycanopathy (LGMD2C): broadening of the mutational spectrum guided by the immunohistochemical profile. *Neuromuscul Disord* 12:273-280.
- Jaramillo D, Connolly SA, Vajapeyam S, Robertson RL, Dunning P, Mulkern RV, Hayward A, Maier SE, Shapiro F. (2003) Normal and ischemic epiphysis of the femur: Diffusion MR imaging--study in piglets. *Radiology* 227:825-832.
- Jaramillo D, Villegas-Medina OL, Doty D, Rivas R, Strife K, Dwek JR, Mulkern RV, Shapiro F. (2004) Age-related vascular changes in the epiphysis, physis, and metaphysis: normal findings on gadolinium-enhanced MR imaging of piglets. *AJR (American Journal of Roentgenology)* 182:353-360
- Connolly SA, Jaramillo D, Hong J, Shapiro F. (2004) Skeletal development in fetal pig specimens: MR imaging of femur with histologic comparison. *Radiology* 233:505-514.
- Shapiro F, Sethna N. (2004) Blood loss in pediatric spine surgery. *Eur Spine J* 13 (Suppl):S6-S17.
- Sethna NF, Zurakowski D, Brustowicz RM, Bacsik J, Sullivan LJ, Shapiro F. (2005) Tranexamic acid reduces intraoperative blood loss in pediatric patients undergoing scoliosis surgery. *Anesthesiology* 102:727-732.
- Forriol F, Shapiro F (2005) Bone development: interaction of molecular components and biophysical forces. *Clin Orthop Rel Res* 432:14-33.
- Diab M, Darras BT, Shapiro F. Scapulothoracic fusion in facioscapulohumeral muscular dystrophy. (2005) *J Bone Joint Surg [Am]* 87:2267-2275.
- Menezes NM, Connolly SA, Shapiro F, Olear EA, Jimenez RM, Jaramillo D. Early prediction of ischemia in the growing skeleton. *Radiology* (in press).
- Shapiro F, Mulhern H, Weis MA, Eyre D. Rough endoplasmic reticulum abnormalities in a patient with Spondylo-epi-metaphyseal dysplasia with scoliosis, joint laxity, and finger deformities. *Ultrastruc Pathol* (in press).
- Velasco MV, Colin AA, Zurakowski D, Darras BT, Shapiro F. Posterior spinal fusion for scoliosis in Duchenne muscular dystrophy diminishes the rate of respiratory decline. *Spine* (in press).

