

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.  
 Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME <b>Ernesto Canalis, M.D.</b>		POSITION TITLE Director, Department of Research, Saint Francis Hospital and Medical Center	
eRA COMMONS USER NAME (credential, e.g., agency login) <b>ernestocanalis</b>		Professor of Medicine and Orthopedics, University of Connecticut School of Medicine	
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
Univ. Peruana Cayetano Heredia, Lima, Peru	M.D.	1969	Medicine
Univ. of Conn. Health Center, Farmington, CT	Intern	1969-1970	Medicine
Henry Ford Hospital, Detroit, MI	Resident	1970-1971	Medicine
Univ. of Conn. Health Center, Farmington, CT	Resident	1971-1972	Medicine
Tufts-New England Medical Center, Boston, MA	Fellow	1972-1974	Endocrinology

**A. Positions and Honors**

**Positions**

Instructor of Medicine, University of Connecticut School of Medicine, Farmington, CT 1974-1976  
 Assistant Professor of Medicine, University of Connecticut School of Medicine 1976-1981  
 Associate Professor of Medicine, University of Connecticut School of Medicine 1981-1985  
 Professor of Medicine, University of Connecticut School of Medicine 1985-present  
 Professor of Medicine and Orthopedic Surgery, University of Connecticut School of Medicine 1990-present  
 Director of Research Laboratory, Saint Francis Hospital and Medical Center 1978-1990  
 Director of Research, Saint Francis Hospital and Medical Center 1990-present

**Honors**

Ann Doner Vaughan Kappa Delta Award for Excellence in Orthopedic Research by the American Academy of Orthopedic Surgeons, 1990  
 Gerald Aurbach Lectureship Award, Endocrine Society, 1996  
 Marshall Urist Award for Excellence in Tissue Regeneration Research, Orthopedic Research Society, 1998  
 The Louis V. Avioli Founders Award for fundamental contributions to bone and mineral basic research, The American Society for Bone and Mineral Research, 2004  
 Member Orthopedic Study Section, NIH Division of Grants, 1985-1988  
 Member General Medicine B Study Section, NIH Division of Grants, 1989-1991  
 Member National Advisory Dental Research Council (NIH), NIDR, 1997-2000  
 President of the American Society for Bone and Mineral Research, 1994-1995 – Councilor, 1989-1992; Chairman of Program Committee, 1988  
 Board Member of the International Bone and Mineral Society, 1989-1998  
 Scientific Advisory Board Member of National Osteoporosis Foundation, 1991-1999  
 Scientific Advisory Board Member of The Patrick and Catherine Weldon Donaghue Medical Research Foundation, 1994-1997; Member of Steering Committee - 1997-2004  
 Scientific Advisory Panel Member, United States Pharmacopeial, 1996-2000  
 Member of Stem Cell Advisory Committee, State of Connecticut, 2006-  
 Editor, Journal of Clinical Endocrinology and Metabolism, 1991-1993. Associate Editor of Bone, 1986-2003  
 Consulting Editor, Journal of Clinical Investigation, 1997-2006  
 Editorial Board, Journal of Bone and Mineral Research, 1990-1993. Endocrinology, 1993-1997, 2004-2008  
 Diplomat American Board Internal Medicine, 1972. Endocrinology, 1975  
 Member of American Society for Clinical Investigation, Association of American Physicians, Endocrine Society, American Society for Bone and Mineral Research, Orthopedic Research Society

**B. Selected peer-reviewed publications.** Total career publications over 290

1. Canalis, E., Gabbitas, B. Skeletal growth factors regulate the synthesis of insulin-like growth factor binding protein-5 in bone cell cultures. *J Biol Chem* 270:10771-10776, 1995
2. Delany, A.M., Jeffrey, J.J., Rydziel, S., Canalis, E. Cortisol increases interstitial collagenase expression in osteoblasts by post-transcriptional mechanisms. *J Biol Chem* 270:26607-26612, 1995
3. Gabbitas, B., Pash, J.M., Delany, A. M., Canalis, E. Cortisol inhibits the synthesis of insulin-like growth factor binding protein-5 in bone cells by transcriptional mechanisms. *J Biol Chem* 271:9033-9038, 1996
4. Franchimont, N., Rydziel, S., Delany, A.M., Canalis, E. IL-6 and its soluble receptor cause a marked induction of collagenase 3 expression in rat osteoblast cultures. *J Biol Chem* 272:12144-12150, 1997
5. Franchimont, N., Rydziel, S., Canalis, E. Interleukin-6 is autoregulated by transcriptional mechanisms in cultures of rat osteoblastic cells. *J Clin Invest* 100:1797-1803, 1997
6. Gangji, V., Rydziel, S., Gabbitas, B., Canalis, E. Insulin-like growth factor II promoter expression in cultured rodent osteoblasts and adult rat bone. *Endocrinology* 139:2287-2292, 1998
7. Delany, A., Canalis, E. Dual regulation of stromelysin-3 by fibroblast growth factor-2 in murine osteoblasts. *J Biol Chem* 273:16595-16600, 1998
8. Gaggero, E., Gangji, V., Canalis, E. Bone morphogenetic proteins induce the expression of noggin, which limits their activity in cultured rat osteoblasts. *J Clin Invest* 102:2106-2114, 1998
9. Gaggero, E., Rydziel, S., Canalis, E. Skeletal bone morphogenetic proteins suppress the expression of collagenase 3 by rat osteoblasts. *Endocrinology* 140:562-567, 1999
10. Franchimont, N., Durant, D., Rydziel, S., Canalis, E. Platelet derived growth factor induces interleukin-6 transcription in osteoblasts through the activator protein-1 complex and activating transcription factor-2. *J Biol Chem* 274:6783-6789, 1999
11. Delany, A.M., Amling, M., Priemel, M., Howe, C.C., Baron, R., Canalis, E. Osteopenia and decreased bone formation in osteonectin-deficient mice. *J Clin Invest* 105:915-923, 2000
12. Varghese, S., Rydziel, S., Canalis, E. Basic fibroblast growth factor stimulates collagenase-3 promoter activity in osteoblasts through an activator protein-1-binding site. *Endocrinology* 141:2185-2191, 2000
13. Pereira, R.C., Economides, A.N., Canalis, E. Bone morphogenetic proteins induce gremlin, a protein that limits their activity in osteoblasts. *Endocrinology* 141:4558-4563, 2000
14. Delany, A.M., Canalis, E. The metastasis associated metalloproteinase stromelysin-3 is induced by transforming growth factor beta in osteoblasts and fibroblasts. *Endocrinology* 142:1561-1566, 2001
15. Pereira, R.M.R., Delany, A.M., Canalis, E. Cortisol inhibits the differentiation and apoptosis of osteoblasts in culture. *Bone* 28:484-490, 2001
16. Delany, A.M., Durant, D., Canalis, E. Glucocorticoid suppression of IGF I transcription in osteoblasts. *Mol Endocrinol* 15:1781-1789, 2001
17. Pereira, R.C., Delany, A.M., Canalis, E. Effects of Cortisol and Bone Morphogenetic Protein-2 on Stromal Cell Differentiation. Correlation with C/EBP Expression. *Bone* 30:685-691, 2002
18. Devlin, R.D., Du, Z., Buccilli, V., Jorgetti, V., Canalis, E. Transgenic Mice Overexpressing Insulin-Like Growth Factor Binding Protein-5 Display Transiently Decreased Osteoblastic Function and Osteopenia. *Endocrinology* 143:3955-3962, 2002
19. Kalajzic, Z., Liu, P., Kalajzic, I., Du, Z., Braut, A., Mina, M., Canalis, E., Rowe, D.W. Directing the expression of a Green Fluorescent Protein transgene in differentiated osteoblasts: a comparison between rat type I collagen and rat osteocalcin promoters. *Bone* 31:654-660, 2002
20. Devlin, R.D., Du, Z., Pereira, R.C.P., Kimble, R.B., Economides, A.N., Jorgetti, V., Canalis, E. Skeletal Overexpression of Noggin Results in Osteopenia and Reduced Bone Formation. *Endocrinology* 144:1972-1978, 2003
21. Delany A.M., Kalajzic I., Bradshaw A.D., Sage E.H., Canalis E. Osteonectin-null mutation compromises osteoblast formation, maturation, and survival. *Endocrinology* 144:2588-2596, 2003
22. Sciaudone, M., Gaggero, E., Priest, L., Delany, A.M., Canalis, E. Notch 1 Impairs Osteoblastic Cell Differentiation. *Endocrinology* 144:5631-5639; 2003
23. Rydziel, S., Delany, A.M., Canalis, E. AU-Rich Elements in the Collagenase 3 mRNA Mediate Stabilization of the Transcript by Cortisol in Osteoblasts. *J Biol Chem* 279:5397-5404; 2004
24. Pereira, R.C., Delany, A.M., Canalis, E. CCAAT/Enhancer Binding Protein Homologous Protein (DDIT3) Induces Osteoblastic Cell Differentiation. *Endocrinology* 145:1952-1960, 2004

25. Durant, D., Pereira, R., Stadmeyer, L., Canalis, E. Transgenic Mice Expressing Selected Insulin-Like Growth Factor Binding Protein-5 Fragments Do Not Exhibit Enhanced Bone Formation. *Growth Horm IGF Res* 14:319-327, 2004
26. Gazzo, E., Pereira, R.C., Jorgetti, V., Olson, S., Economides, A.N., Canalis, E. Skeletal Overexpression of Gremlin Impairs Bone Formation and Causes Osteopenia. *Endocrinology* 146:655-665, 2005
27. Gazzo, E., Deregowski, V., Vaira, S., Canalis, E. Overexpression of Twisted Gastrulation Inhibits Bone Morphogenetic Protein Action and Prevents Osteoblast Cell Differentiation *In Vitro*. *Endocrinology* 146:3875-3882, 2005
28. Canalis, E. The Fate of Circulating Osteoblasts. *N Engl J Med* 352:2014-2016, 2005
29. Parisi, M. S., Gazzo, E., Rydzial, S., and Canalis, E. Expression and regulation of CCN genes in murine osteoblasts. *Bone* 38:671-677, 2006.
30. Deregowski, V., Gazzo, E., Priest, L., Rydzial, S., and Canalis, E. Notch 1 Overexpression Inhibits Osteoblastogenesis by Suppressing Wnt/beta-Catenin but Not Bone Morphogenetic Protein Signaling. *J Biol Chem* 281:6203-6210, 2006.
31. Gazzo, E., Deregowski, V., Stadmeyer, L., Gale, N.W., Economides, A.N., Canalis, E. Twisted Gastrulation, A Bone Morphogenetic Protein Agonist/Antagonist, Is Not Required for Post Natal Skeletal Function. *Bone* 39:1252-1260, 2006
32. Deregowski V, Gazzo E, Priest L, Rydzial S, Canalis E. Role of the RAM domain and ankyrin repeats on notch signaling and activity in cells of osteoblastic lineage. *J Bone Min Res* 21:1317-26, 2006.
33. Glatt, V., Canalis, E., Stadmeyer, L., and Bouxsein, M. L. Age-Related Changes in Trabecular Architecture Differ in Female and Male C57BL/6. *J Bone Min Res* 22:1197-1207, 2007
34. Canalis, E., Mazziotti, G., Giustina, A., and Bilezikian, J.P. Glucocorticoid-Induced Osteoporosis: Pathophysiology and Therapy. *Osteoporos Int* 18:1319-1328, 2007
35. Canalis, E., Giustina, A., and Bilezikian, J. P. Mechanisms of Anabolic Therapies for Osteoporosis. *N Engl J Med* 357:905-916, 2007
36. Rydzial, S., Stadmeyer, L., Zanotti, S., Durant, D., Smerdel-Ramoya, A., and Canalis, E. Nephroblastoma overexpressed (NOV) inhibits osteoblastogenesis and causes osteopenia. *J Biol Chem* 282:19762-19772, 2007
37. Gazzo, E., Smerdel-Ramoya, A., Zanotti, S., Stadmeyer, L., Durant, D., Economides, A., and Canalis, E. Conditional Deletion of Gremlin Causes a Transient Increase in Bone Formation and Bone Mass. *J Biol Chem* 282:31549-31557, 2007
38. Giustina, A., Mazziotti, G., and Canalis, E. Growth Hormone, Insulin-Like Growth Factors and the Skeleton. *Endocr Rev* 29:535-559, 2008
39. Pearsall, R., Canalis, E., Cornwall-Brady, M., Underwood, K., Haigis, B., Ucran, J., Dumar, R., Pobre, E., Gringerg, A., Werner, E., Glatt, V., Stadmeyer, L., Smith, D., Seehra, J., Bouxsein, M. A Soluble Activin Type IIA Receptor Induces Bone Formation and Improves Skeletal Integrity. *Proc Natl Acad Sci U.S.A.* 105:7082-7087, 2008
40. Zanotti, S., Smerdel-Ramoya, A., Stadmeyer, L., Durant, D., Radtke, F., Canalis, E. Notch Inhibits Osteoblast Differentiation and Causes Osteopenia. *Endocrinology* 149:3890-3899, 2008
41. Canalis, E. Notch Signaling in Osteoblasts. *Sci Signal*, 1:e17, 2008
42. Smerdel-Ramoya, A., Zanotti, S., Stadmeyer, L., Durant, D., Canalis, E. Skeletal Overexpression of Connective Tissue Growth Factor (CTGF) Impairs Bone Formation and Causes Osteopenia. *Endocrinology* 149:4374-4381, 2008
43. Smerdel-Ramoya, A., Zanotti, S., Deregowski, V., Canalis, E. Connective Tissue Growth Factor (CTGF) Enhances Osteoblastogenesis *In Vitro*. *J Biol Chem* 283:22690-22699, 2008

## C. Research Support

### Ongoing Research Support

R01-AR-021707 Canalis (PI) 06/01/08 – 05/31/13  
National Institute of Arthritis Musculoskeletal and Skin Diseases  
Effect of Growth Factors on Aspects of Bone Formation

Program Director/Principal Investigator (Last, First, Middle): Canalis, Ernesto

The long term objective of this project is to investigate the actions of selected growth factors and their antagonists on bone cell function.

Role: PI

R01-DK-042424 Canalis (PI) 08/01/05 - 07/31/09

National Institute of Diabetes Digestive and Kidney Diseases

Somatomedin-Autologous Regulator of Bone Formation

The long term objective of this project is to investigate the regulation and function of insulin-like growth factor and C/EBP homologous protein (Ddit3) in osteoblasts.

Role: PI

R01-DK-045227 Canalis (PI) 08/01/04 - 07/31/08

National Institute of Diabetes Digestive and Kidney Diseases

Mechanisms of Cortisol Action in Bone

The long term objective of this project is to investigate the actions of cortisol and Notch on osteoblastic function.

Role: PI

### **Completed Research Support**

IP30-AR-46026 Lorenzo (PI) 01/01/01 - 12/31/05

National Institute of Arthritis Musculoskeletal and Skin Diseases

Core Center for Musculoskeletal Research

This Core grant provides vector, imaging and microarray support to multiple investigators at our Institution and The University of Connecticut Health Center.

Role: Associate Director