CURRICULUM VITAE

NAME: Harrison Clarke Anderson

EDUCATION:
University of Louisville, Kentucky
B.A. Zoology – 1954
University of Louisville
Kentucky – School of Medicine – M.D. – 1958

SCHOLARSHIPS AND AWARDS:
American Air Filter Foundation Scholar – 1954-58
Commonwealth Research Scholar – 1956-57
Kentucky Heart Association Research Scholar – 1957-58
Alpha Omega Alpha – 1957
Omicron Delta Kappa award for leadership – 1958
Elizabeth Winston Lanier, Kappa Delta Award for Orthopaedic Research – 1982
Biological Mineralization Research Award of the International Association for Dental Research – 1985
University of Kansas Medical Center Senior Faculty Research Award – 1986
Dolf Simon Sr.-Higuchi Award for biomedical research, (awarded by the University of Kansas) – 1991

HOSPITAL TRAINING:
Intern in Pathology – Massachusetts General Hospital – 1958-59
Fellow in Pathology – Memorial Hospital for Cancer and Allied Diseases – New York City – 1960-61
Chief Resident, Pathology – Memorial Hospital for Cancer and Allied Diseases – 1961-62

RESEARCH APPOINTMENTS:
National Cancer Institute Trainee in Pathology
University of Louisville, School of Medicine and Louisville General Hospital – 1959 – 60
Research Fellow, Sloan Kettering Institute – 1962-63
N.I.H. Special Research Fellow, Strangeways Research Laboratory, Cambridge, England – 1971-72
N.I.H. National Research Service Fellow, Department of Cell Biology, Yale University School of Medicine (sponsors: J.D. Jamieson and G. Palade) 1984-85

TEACHING APPOINTMENTS:

State University of New York Downstate Medical Center:	
Assistant Professor	1963-67
Associate Professor	1967-61
Active member, graduate faculty,	1968-78
Professor	1971-78
University of Kansas Medical Center	
Professor and Chairman of Pathology	1978-90
Harrington Professor of Orthopedic Research	1990-
Professor Emeritus of Pathology	2001-

HOSPITAL APPOINTMENTS:

Kings County Hospital	1966-70
Assistant attending in Pathology	1960-78
State University Hospital, Downstate Medical Center: Active Staff, Pathology	1968-78
University of Kansas Hospital	
Attending in Pathology	1978-

RESEARCH GRANTS:	**N.I.H., N.C.I. – "Cartilage and bone formation induced by FL cells" (Renewed 1969 and 1974)**	**1966-77**
	Research Foundation, State University of New York. "Calcification in cultured cartilage and bone"	**1971-72**
	Arthritis Foundation. "Properties of calcifying matrix vesicles from rachitic rat epiphyseal cartilage" (with Dr. S.W. Sajdera)	**1972**
	N.I.H., N.I.A.M.D.D. "Calcifying matrix Vesicles of cartilage and bone"	**1974-77**
	N.I.H., N.I.A.M.D.D. "Second Conference on Matrix Vesicle Calcification"	**1978**
	U.S.A.F., A.F.O.S.R. contract. "Mechanical Properties of four human long bones"	**1979-81**
	N.I.H., N.I.D.R. National Service Award: "Membrane Analysis Related to Calcifying Matrix Vesicles"	**1984-85**
	Kyocera Corporation grant. "Production of a Monoclonal antibody to semipurified human BMP development of immunoassay and immunolocalization of BMP"	**1985-88**
	N.I.H., N.I.A.M.S.D. "Cell Mediated Calcification and Matrix Vesicle Conference."	**1990-91**
	N.I.H., N.I.E.H.S. "Conference on Environmental Bone-Seeking Agents"	**1995**
	Zimmer, Corp. "Isolation and purification of a Bone-inducing agent from Saos-2 human Osteosarcoma cells"	**1997-99**
	N.I.H., N.I.D.R. "Mineralization studies Related to oral biology" (Renewed 1983, 1987, 1990, 1999 and 2002)	**1978-07**
ADMINISTRATIVE COMMITTEES:	**Subcommittee on Cell Biology of the Student Faculty Committee on Curriculum Development**	**1970-71**
	Search Committee, Biochemistry.	**1970-71**
	Administrative Committee, M.D.,-Ph.D. Program	**1971-78**
	Search Committee, Medicine	**1972-74**
	Downstate Medical Center Budget and Resources Committee	**1973-75**
	Faculty Committee on Academic and Professional Qualifications (promotions and tenure)	**1973-78**
	Faculty Senate, State University of New York	**1973-76**
	N.I.H. Special Study Sections, Dental, GMA And GMB	**1973-**

ADMINISTRATIVE COMMITTEES (continued)	**Scientific Advisory Committee, University of Pennsylvania Center for Oral Health Research**	**1975-77**
	Faculty Senate, State University of New York, Committee on Research	**1976-77**
	Downstate Medical Center, Health Sciences Committee on Investigations Involving Human Subjects	**1976-77**
	N.I.H. Study Section, Oral Biology and Medicine	**1977-81**
	Gordon Research Conference on Bones and Teeth Vice Chairman 1980, Chairman 1981	**1980-81**
	Board of Directors, Universities Associated for Research and Education in Pathology (UAREP)	**1978-90**
	Secretary-Treasurer, UAREP	**1988-90**
	President, University Pathology Associates (KUMC)	**1981-90**
	Association of Pathology Chairmen, Council	**1984-90**
	President-Elect	**1986-88**
	President	**1988-90**
	Past President	**1990-92**
	Orthopaedic Research Society, Program Committee	**1993-95**
	N.I.H. Study Section, Oral Biology and Medicine	**1999-2006**
SCHOOL RESPONSIBILITIES:	**Attending on Autopsy Service**	**1978-**
	Executive Committee of the Medical Staff	**1978-90**
	V.A. Dean’s Committee	**1978-90**
	Interinstitutional Committee	**1978-90**
	Greater K.C. Bone and Tooth Discussion Group - Organizer and Secretary	**1978-**
	Fall Medical Honors Convocation	**1980-85**
	Basic Sciences Curricular Task Force	**1987-88**
	Utilization Review Committee, Chairman	**1988-89**
	Medical Records Committee, Chairman	**1989-90**
	Chair, Pathology Research and Graduate Committee	**1992-97**
	Director, Pathology Graduate Program	**1992-96**
	MD, Ph.D. Advisory Committee	**1994-99**
	Biological Sciences Lectureship Committee (Chair 1997-1999)	**1996-99**
	KUMC Faculty Council	**1999-2000**
	K.U.M.C. Physiology Dept. Chair Review Committee	**1999**
	K.U.M.C. Faculty Promotions and Tenure Committee	**1997-2000**
MANUSCRIPT AND GRANT REVIEWER:	**American Journal of Anatomy**	
	Archives of Pathology and Laboratory Medicine	
	Bone	
	Bone and Mineral	
	Calcified Tissue International	
	Clinical Orthopaedics and Related Research	
	Journal of Biological Chemistry	
	Journal of Bone and Joint Surgery	
	Journal of Bone and Mineral Research	

MANUSCRIPT AND GRANT REVIEWER (continued)	**Journal of Clinical Investigation** **Journal of Histochemistry and Cytochemistry** **Journal of Orthopedic Research** **Laboratory Investigation** **Medical Research Council, U.K.** **Medical Research Council, New Zealand** **National Institutes of Health** **Scanning Electron Microscopy** **United States – Israel Binational Science Foundation**
EDITOR:	**The First International Conference on Matrix Vesicle Calcification, 1976 (Published in Federation Proceedings.)** **The Second International Conference on Matrix Vesicle Calcification, 1978 (Published in Metabolic Bone Disease and Related Research.)** **The Fifth International Conference on Cell-Mediated Calcification and Matrix Vesicles. 1991. (Published in Bone and Mineral.)** **The Growth Plate, 2002 (IOS Press.)**
JOURNAL EDITORIAL BOARDS	**Metabolic Bone Disease and Related Research, (now "Bone") 1981-96** **Journal of Bone and Joint Surgery, 1981-1986, 1999-** **American Journal of Pathology, 1982-1994** **Journal of Orthopaedic Research, 1982-1993** **Journal of Experimental Pathology, 1982-1986** **Journal of Bone and Mineral Research, 2004-**
MEDICAL LICENSES:	**Kentucky – 12714** **New York - 90632** **Kansas - 17775**
CERTIFICATION:	**Diplomat in anatomic pathology. The American Board of Pathology**
SCIENTIFIC SOCIETIES	**American Association for Dental Research** **American Society for Investigative Pathology** **American Society for Bone and Mineral Research** **American Society for Cell Biology** **Electron Microscopy Society of America** **International Bone and Mineral Society** **Mineralized Tissue Group, International Association For Dental Research** **New York Society of Electron Microscopy** **Orthopaedic Research Society** **Pluto Club** **Royal Society of Medicine** **Sigma Xi** **Societe Internationale de Recherche Orthopedique et de Traumatologie (SIROT)** **United States and Canadian Academy of Pathology**

PUBLICATIONS:

1. Louria, D.B., Anderson, H.C., Horsfall, F.L. Clinico-pathologic conference: complications of chronic myelogenous leukemia. N.Y. State J. of Med. 62:1452-1462, 1962.

2. Gittler, R.D., Anderson, H.C. Clinicopathologic Conference: Hypoglycemia and an intrathoracic mass. N.Y. State J. Med. 62:2005-2015, 1962.

3. Fogh, J., Anderson, H.C., Allen, B., Peturrson, G., Saunders, E.I., Dalldorf, G. Cultivation and characterization of cells from a malignant lymphoma in an African child. Cancer Res. 24:416-431, 1964.

4. Anderson, H.C., Fogh, J., Merker, P.C. Formation of tumors containing bone after intramuscular injection of transformed human amnion cells into cortisone-treated mice. Am. J. Path. 44:507-519, 1964.

5. Anderson, H .C., Riley, V., Fitzmaurice, M.A., Loveless, J.D., Wade, P., Moore, A.E. Quantitative study of the lactate dehydrogenase-elevating virus in mouse embryo cultures. J. Nat. Cancer Inst. 36:89-95, 1966.

6. Anderson, H.C., Electron microscopy of heterotopic bone formation. In: Sixth International Congress for Electron Microscopy, (R. Uyeda, Ed.) Tokyo, Maruzen Co., Ltd. 573-574, 1966.

7. Anderson, H.C., Coulter, P.R. Bone formation induced in mouse thigh by cultured human cells. J. Cell Biol. 33:165-177, 1967.

8. Anderson, H.C. Electron microscopic studies of induced cartilage development and calcification. J. Cell Biol. 35:81-101, 1967.

9. Anderson, H .C. Remarks concerning bone induction by cultured human cells. In: Fourth Conference on Biology of Hard Tissues. M.R. Urist, editor. N.Y. Academy of Sciences, New York, 1968.

10. Anderson, H.C. Vesicles in the matrix of epiphyseal cartilage: fine structure, distribution and association with calcification. In: Proceedings of the 4th European Regional Conference on Electron Microscopy. D.D. Bocciarelli, editor. Tipographia Poliglotta Vaticana, Roma. 437-438, 1968.

11. Anderson, H.C., Coulter, P.R. Effects of EDTA, hyaluronidase and collagenase on epiphyseal cartilage matrix. In Proceedings of the 26th Annual Meeting of the Electron Microscopy Society of America. C.J. Arceneaux, editor. Claitors Publishing Division. Baton Rouge, 56-57, 1968.

12. Anderson, H.C. Vesicles associated with calcification in the matrix of epiphyseal cartilage. J. Cell Biol. 41:59-72, 1969.

13. Anderson, H.C., Kim, B., Minkowitz, S. Calcifying epithelial odontogenic tumor of Pindborg, an electron microscopic study. Cancer 24:585-595, 1969.

14. Anderson, H .C., Matsuzawa, T., Ali, S.Y, Sajdera, S.W. Membranous particles in calcifying cartilage matrix. Trans. N.Y. Acad. Sci. 32:619-630, 1970.

15. Matsuzawa, T., Anderson, H.C. Phosphatases of epiphyseal cartilage studied by electron microscopic histochemistry. In: Proceedings of the Seventh International Congress for Electron Microscopy. 1:529-530, 1970.

16. Anderson, H.C., Chacko, S., Abbott, J., Holtzer, H. The loss of phenotypic traits by differentiated cells in vitro. VII. Effects of 5-bromodeoxyurdine and prolonged culturing on fine structure of chondrocytes. Am. J. Path 60:289-311, 1970.

17. Holtzer, H., Chacko, S., Abbott, J., Holtzer, S., Anderson, H.C. Variable behavior of chondrocytes in vitro. In: Chemistry and molecular biology of the intercellular matrix. Edre A. Balazs, editor, Academic Press. London and New York. 1471-1484, 1970.

18. Ali, S.Y., Sajdera, S.W., Anderson, H.C. Isolation and characterization of calcifying matrix vesicles in epiphyseal cartilage. Proc. Nat. Acad. Sci. (USA) 67:1513-1520, 1970.

19. Anderson, H.C., Sajdera, S.W. Fine structure of bovine nasal cartilage; extraction as a technique to study the organization of proteoglycans and collagen in cartilage matrix. J. Cell Biol. 49:650-663, 1971.

20. Matsuzawa, T., Anderson, H.C. Phosphatases of epiphyseal cartilage studied by electron microscopic cytochemical methods. J. Histochem. and Cytochem. 12:801-808, 1971.

21. Anderson, H.C. Remarks to Santa Catalina Colloquium on Comparative Molecular Biology of Extracellular Matrices. H.C. Slavkin, editor. Academic Press, New York. 199-205, 1972.

22. Hall, T.A., Anderson, H .C., Appleton, T. The use of thin specimens for X-ray microanalysis in biology. J. Microscop. 99 (part 2): 177-182, 1973.

23. Anderson, H.C. Calcium Accumulating vesicles in the intercellular matrix of bone. In: Ciba Symposium on Hard Tissue Growth, Repair and Remineralization. 213-246, 1973.

24. Anderson, H.C., Reynolds, J.J. Pyrophosphate stimulation of initial mineralization in cultured embryonic bones. Fine structure of matrix vesicles and their role in mineralization. Develop. Biol. 34:211-227, 1973.

25. Peress, NS., Anderson, H.C., Sajdera, S.W. The lipids of matrix vesicles from bovine fetal epiphyseal cartilage. Calcif. Tissue Res. 14:275-281, 1974.

26. Anderson, H.C, Brosnan, E.J. Bone formation in HeLa-cell mouse thigh tumors explanted to mouse brain. In: Second International Santa Catalina Island

Colloquium on Extracellular Matrix Influences on Gene Expression. H.C. Slavkin and R. Gruelich, editors. Pp. 627-632, 1975.

27. Anderson, H.C., Cecil R., Sajdera, W.S. Calcification of rachitic rat cartilage in vitro by extracellular matrix vesicles. Am. J. Path. 79:237-254, 1975.

28. Anderson, H.C. Videotape on "Metabolic Diseases of Bone". In: Video Digest Pathology Series. James L. Bennington, editor 1975.

29. Anderson, H.C. Introduction to the First International Conference on Matrix Vesicle Calcification. Fed. Proc. 35:105-108, 1976.

30. Rabinovitch, A.L., Anderson, H.C. Biogenesis of matrix vesicles in cartilage growth plates. Fed. Proc. 35:112-116, 1976.

31. Anderson, H.C., Sajdera, S.W. Calcification of rachitic cartilage to study matrix vesicle function. Fed. Proc. 35:148-153, 1976.

32. Anderson, H.C. Matrix Vesicles of Cartilage and Bone. A chapter in the 4th volume of "Biochemistry and Physiology of Bone". G.H. Bourne, editor. Academic Press, New York, pp. 135-155, 1976.

33. Anderson, H.C. An invited review on "Osteogenetic Epithelial-Mesenchymal Cell Interaction". Clin. Orthop. And Rel. Res. 119:211-224, 1976.

34. Anderson, H.C., Griner, S.A. Cartilage induction in vitro. Ultra-structural studies. Develop. Biol. 60:351-358, 1977.

35. Hsu, H.H.T., Anderson, H.C. A simple and defined method to study calcification by isolated matrix vesicles. Biochem. Biophys. Acta 500:162-172, 1977.

36. Hsu, H.H.T., Anderson, H.C. Calcification of isolated matrix vesicles and reconstituted vesicles from fetal bovine cartilage. Proc. Nat. Acad. Sci. (USA) 75:3805-3808, 1978.

37. Elias, A.N., Pinals, R.S., Anderson, H .C., Gould, L.V., Streeten, D.H.P. Hereditary osteodystrophy with acro-osteolysis. (The Hajdu-Cheny Syndrome. Am. J. Med. 65:627-636, 1978.

38. Anderson, H.C. Introduction to the Second International Conference on Matrix Vesicle Calcification. Metab. Bone Dis. And Rel. Res. 1:83-87, 1978.

39. Anderson, H.C., Hsu, H.H.T. A new method to measure 45 calcium accumulation by matrix vesicles in slices of rachitic growth plate cartilage. Metab. Bone Dis. Rel. Res. 1:193-197, 1978.

40. Cecil, R.N.A., Anderson, H.C. Freeze-fracture studies of matrix vesicle calcification in epiphyseal growth plate. Metab. Bone Dis. Rel. Res. 1:89-95, 1978.

41. Fortuna, R., Anderson, H.C., Carty, R.P., Sajdera, S.W. The purification and molecular characterization of alkaline phosphatases from chondrocytes and matrix vesicles of bovine fetal epiphyseal cartilage. Metab. Bone Dis. Rel. Res. 1:161-168, 1978.

42. Hsu, H.H.T., Cecil, R.N.A., Anderson, H.C. Role of ATPase, phospholipids and vesicular structure in the calcification of isolated and reconstituted matrix vesicles. Metab. Bone Dis. Rel. Res. 1:169-172, 1978.

43. Fortuna, R., Anderson, H.C., Carty, R.P., Sajdera, S.W. Enzymatic characterization of the chondrocytic alkaline phosphatase isolated from bovine fetal epiphyseal cartilage. Biochem. Biophys., Acta 570, 291-302, 1979.

44. Fortuna, R., Anderson, H.C., Carty, R.P., Sajdera, S.W. Enzymatic characterization of the matrix vesicle alkaline phosphatase isolated from bovine fetal epiphyseal cartilage. Calcif. Tiss. Internat. 30:217-225, 1980.

45. Anderson, H.C. Calcification processes, In: Pathology Annual. S.C. Sommers and P.R. Rosen, editors. Appleton-Century-Crofts, N.Y. Part 2, Vol. 15:45-75, 1980.

46. Hsu, H.H.T., Hassanein, K.M., Anderson, H.C. Studies on phosphatase activities of isolated calf matrix vesicles from bovine cartilage. IRCS Medical Sci. 8:620-621, 1980.

47. Anderson, H.C., Johnson, T.F., Avramides, A. Matrix vesicles in osteomalacic bone. Metab. Bone Dis. And Rel. Res. 25:79-86, 1980.

48. Anderson, H.C. Normal and abnormal mineralization in mammals. In: Proc. Twenty-seventh Annual Meeting, Amer. Soc. For Artificial Internal Organs. (702-707) 1981.

49. Anderson, H.C., Hsu, H.H.T., Johnson, T.F., Murphree, S.S., Stein, R.M. Matrix vesicles in rickets. Proc. Third Internat. Conf. On Matrix Vesicles. A Ascenzi, E. Bonucci and B. deBernard, editors. Wichtig Editore srl, Milano. 223-228, 1981.

50. Hsu, H.H.T., Richardson, C.A., Anderson, H.C. Ca^{2+} and/or Mg^{2+} requirements of ATPase of matrix vesicles isolated from fetal bovine epiphyseal cartilage. Proc. Third Internat. Conf. Of Matrix Vesicles. A. Ascenzi, E. Bonucci and B. deBernard, editors, Wichtig Editore srl, Milano. 74-78, 1981.

51. Stein, R.M., Hsu, H.H.T., Anderson, H.C. Protein profiles of isolated fetal calf and rachitic rat matrix vesicles by polyacrylamide gel electrophoresis. Proc. Third Internat. Conf. On Matrix Vesicles. A. Ascenzi, E. Bonucci and B. deBernard, editors. Wichtig Editore srl, Milano. 117-122, 1981.

52. Hsu, H.H.T., Anderson, H.C. Effect of levamisole on ATPase and phosphatases of matrix vesicles isolated from fetal bovine epiphyseal cartilage IRCS (Biochem.) 9:590-591, 1981.

53. Murphree, S., Hsu, H.H.T., Anderson, H.C. In vitro formation of crystallilne apatite by matrix vesicles isolated from rachitic rat epiphyseal cartilage. Calcif. Tiss. Internat. 34:S62-S68, 1982.

54. Hsu, Howard, H.T., Anderson, H.C. Some properties of calcium-binding activity in butanol extracts of matrix vesicles isolated from fetal bovine epiphyseal cartilage. Internat. J. Biochem. 15:317-322, 1983.

55. Kanabe, S., Hsu, H.H.T., Cecil, R.N.A., Anderson, H.C. Electron microscopic localization of ATP-hydrolyzing activity in isolated matrix vesicles and reconstituted vesicles from calf cartilage. J. Histochem. and Cytochem. 3:462-470, 1983.

56. Anderson, H.C. Calcific diseases: A concept. Arch. Path. And Lab. Med. 107:341-348, 1983.

57. Tanimura, A., McGregor, D.H., Anderson, H.C. Matrix vesicles in athero-sclerotic calcification. Proc. Soc. Exper. Biol. and Med. 172:173-177, 1983.

58. Vaananen, H.K., Morris, D.C., Anderson, H.C. Calcification of cartilage matrix in chondrocyte cultures derived from rachitic growth plate. Metab. Bone Dis. and Rel. Res. 5:87-92, 1983.

59. Morris, D.C., Vaananen, H.K., Anderson, H.C. Matrix Vesicle Calcification in rat epiphyseal growth plate cartilage prepared antrydrously for electron microscopy. Metab. Bone Dis. and Rel. Res. 5:131-137, 1983.

60. Bohn, W.W., Stein, R.M., Hsu, H.H.T., Morris, D.C., Anderson, H.C. Isolation of a plasma membrane-enriched fraction from collagenase-suspended rachitic rat growth plate chondrocytes. J. Orthopaed. Res. 1:319-324, 1984.

61. Anderson, H.C. Mineralization by matrix vesicles. Scan. Electr. Microsc. II:953-964, 1984.

62. Hsu, H.H.T., Anderson, H.C. The deposition of calcium pyrophosphate and phosphate by matrix vesicles isolated from fetal bovine epiphyseal cartilage. Calcif. Tiss. Internat. 36:615-621, 1984.

63. Kanabe, S., Hsu, H.H.T., Cecil, R.N.A., Anderson, H.C. Electron microscopic localization of adenosine triphosphate (ATP)-hydrolyzing activity in isolated matrix vesicles. In: “Endocrine Control of Bone and Calcium Metabolism.” D.V. Cohn, J.T. Potts, Jr., and T. Fujita, eds. Elsevier, Amsterdam. Vol 88, pp. 425-427, 1984.

64. Anderson, H.C., Kanabe, S., Vaananen, H.K., Oppliger, I., Morris, D.C., Bohn, W.W., Hsu, H.H.T. Phosphatases and matrix vesicle calcification. In: “Endocrine Control of Bone and Calcium Metabolism”. D.V. Cohn, J.T. Potts, Jr., T. Fujita, Eds., Elsevier, Amsterdam. Vol. 88, pp. 410-413, 1984.

65. Vaananen, H.K., Morris, D.C., Anderson, H.C. Calcification of cartilage matrix in chondrocyte cultures derived from rachitic rat growth plate

cartilage. In: "Endocrine Control of Bone and Calcium Metabolism". D.V. Cohn, J.T. Potts, Jr. and T. Fujita, eds. Elsevier, Amsterdam. Pp. 444-447, 1984.

66. Hsu, H.H.T., Munoz, P.A., Barr, J., Oppliger, I., Morris, D.C., Vaananen, H.K., Tarkenton, N., Anderson, H.C. Purification and partial characterization of alkaline phosphatase of matrix vesicles from bovine epiphyseal cartilage. Purification by monoclonal antibody affinity chromatography. J. Biol. Chem. 260:1826-1831, 1985.

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68. Anderson, H.C. Normal biological calcification. Role of cells, membranes, matrix vesicles, and phosphatase. In: "Calcium in Biological Systems." R.P. Rubin, G.B. Weiss and J.W. Putney, Jr., eds. Plenum, New York, pp. 599-606, 1985.

69. Anderson, H.C. Calcific diseases. The role of membranes in pathological calcification. In: "Cell Mediated Calcification and Matrix Vesicles". S. Y. Ali, ed. Elsevier, Amsterdam. pp. 355-358, 1986.

70. Morris, D.C., Vaananen, H.K., Anderson, H.C. Light and electron microscopic immunolocalization of alkaline phosphatase in bovine growth plate cartilage. In: "Cell Mediated Calcification and Matrix Vesicles". S.Y. Ali, ed. Elsevier, Amsterdam. pp. 17-20, 1986.

71. Hsu, H.H.T., Hsu, R., Stewart, T., Anderson, H.C. Some genetic aspects of cartilage alkaline phosphatase. In: "Cell Mediated Calcification and Matrix Vesicles". S.Y. Ali, ed. Elsevier, Amsterdam, pp. 75-82, 1986.

72. Oppliger, I., Vaananen, H.K., Munoz, P.A., Hsu, H.H.T., Morris, D. C., Anderson, H.C. Development of monoclonal antibodies to bone matrix vesicle alkaline phosphatase. Bone 7:373-378, 1986.

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74. Tanimura, I., McGregor, D.H., Anderson, H.C. Calcification in atherosclerosis. II. Animal Studies. J. Exp. Path. 2:275-298, 1986.

75. Caplan, M.J., Anderson, H.C., Palade, G.E., Jamieson, J.D. Intracellular sorting and polarized cell surface delivery of Na, K-ATPase, an endogenous component of MDCK cell basolateral plasma membranes. Cell 46:623-631, 1986.

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78. Hsu, H.H.T., Rouse, J., Hamilton, J., Anderson, H.C. Purification and partial amino acid sequencing of rat bone tumor (UMR106) alkaline phosphatase. Biochem. Biophys. Acta 913:329-334, 1987.

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80. Caplan, M.J., Stow, J.L., Newman, A.P., Madri, J.A., Anderson, H.C., Farquhar, M.G., Palade, G.E., Jamieson, J.D. Synthesis and polarized delivery of endogenous MDCK cell membrane and secretory proteins. In: "Molecular Mechanisms in the Regulation of Cell Behavior", Alan R. Liss, Inc., pp. 179-195, 1987.

81. Caplan, M.J., Stow, J.L., Newman, A.P., Madri, J.A., Anderson, H.C., Farquhar, M.G., Palade, G.E., Jamieson, J.D. Dependence on pH of polarized sorting of secreted proteins. Nature 329:632-635, 1987.

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83. Morris, D.C., Randall, J.C., Anderson, H.C. Light microscopic localization of alkaline phosphatase in fetal bovine bone using immunoperoxidase and immunogold-silver staining procedures. J. Histochem. Cytochem. 36:323-37, 1988.

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85. Hsu, H.H.T., Rouse, J., Hamilton, J., Anderson, H.C. Purification and partial amino acid sequencing of alkaline phosphatase from rachitic rat epiphyseal cartilage. Int. J. Biochem. 20:1985-1990, 1988.

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101. **Anderson, H.C., Dhanyamraju, R., Sipe, J.B., Roach, H.I. The relationship between chondrocyte cell death and matrix vesicle formation. 7th Int. Conf. on Chem. And Biol. Mineralized Tissues. (Nov) 2001.**

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105. **Roach, H.I., Anderson, H.C. Does programmed cell death play a role in matrix vesicle formation? J Bone Min. Res., 17(5):945, OC14 May 2002.**

106. **Roach, H.I., Sipe, J., Dhanyamraju, R., Anderson, H.C. Matrix vesicle formation and programmed cell death. Is there a connection? In the Trans. 1st Int. Conf. on the Growth Plate, 2002.**

107. **Sipe, J.B., Waits, C.A., Skikne, B., Imike, M., Dhanyamraju, R., Anderson, H.C. The presence of bone morphogenetic proteins (BMPs) in megakaryocytes and platelets. J. Bone Min. Res., 17(Suppl. 1):M159, 2002.**

108. **Sipe, J., Dhanyamraju, R., Anderson, H.C. Bone morphogenetic proteins in osteoclasts. In the Trans. 1st Int. Conf. on the Growth Plate, 2002.**

109. **Waits, C., Sipe, J., Dhanyamraju, R., Anderson, H.C. Distribution of bone morphogenetic proteins (BMPs) during induced heterotopic bone formation, evaluated by immunohistochemistry. Trans. Orthop. Res. Soc., 267:518, 2002.**

110. **Anderson, H.C., Sipe, J.E., Dhanyamraju, R., Camacho, N.P., Hessle, L., Millan, J.L. Mechanism of hypomineralization in growth plates of alkaline phosphatase deficient mice. J. Bone Min. Res., 18(Suppl.2):S282, 2003.**

111. **Dhanyamraju, R., Sipe, J., Zhang, J., Xu, Y., Osdoby, P., Insogna, K., Anderson, C. Localization of bone morphogenetic proteins (BMPs) in osteoclasts. Trans. Orthop. Res. Soc., 28:375, 2003.**

112. **Anderson, H.C., Harmey, D., Camacho, N.P., Garimella, R., Sipe, J.B., Tague, S., Terkeltaub, R., Millan, J.L. Hypomineralization of tibia in nucleoside triphosphate pyrophosphohydrolase (NPP1) deficient mice. J. Bone Min. Res., 19(Suppl. 1):F39, 2004.**

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116. Garimella, R., Kacena, M., Tague, S.E., Horowitz, M.C., Anderson, H.C. Expression of bone morphogenetic proteins and their receptors in the bone marrow megakaryocytes of mice genetically impaired for GATA-1 expression (GATA-1low Mice): a possible role in osteosclerosis. J Bone Min. Res., 20(suppl. 1): S108, 2005.

117. Nahar, N.N., Missana, L.R., Garimella, R., Tague, S.E., Anderson, H.C. Matrix vesicles are carriers of bone morphogenetic proteins (BMPs) and non-collagenous matrix proteins. J. Bone Min. Res., 20(suppl. 1):M321, 2005.

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121. Nahar, N.N., Tague, S., Anderson, H.C. Characterization of bone marrow in ectopic bone induced by Saos-2 cell products-a model of endochondral ossification. International workshop on the Skeletal Growth Plate. 2006.

122. Jeong, J-H., Kim, H-J, Kim, H-N., Park, E-K., Cho, J-Y, Garimella, R., Naher, N.N., Anderson, H.C., Lim, J-K., Kim, S-Y., Choi, J-Y. Analysis of bone matrix vesicle proteins from long bone growth plates. J. Bone Min. Res. 22(Suppl. 1):S383, 2007.

INVITED LECTURES:

Fourth Conference on Biology of Hard Tissues.	**1968**
Electron Microscopy Society of America, "A Symposium on Connective tissues and Intercellular Substances".	**1968**
Invited lecture on "Membranous Particles in Calcifying Cartilage Matrix", Section on Biophysics, New York Academy of Science	**1970**
Gordon Research Conference on Chemistry, Physiology and structure of Bones and Teeth.	**1971-3**
Colloquium on Bone Induction, Institute of Orthopaedics, Royal National Orthopaedics Hospital, Stanmore, England.	**1972**
Colloquium on Ultrastructural Aspects of Endochondral Calcification and Growth, Institute of Orthopaedics, Royal National Orthopaedics Hospital, Stanmore, England	**1972**
Santa Catalina Colloquium on, "Comparative Molecular Biology of Extracellular Organic Matrices".	**1972**
Ciba Foundation Symposium on, "Hard Tissue Growth, Repair and Remineralizaton".	**1973**
New York Society of Electron Microscopy, "Symposium on Extracellular Matrices".	**1973**
Cornell Medical Center, Medical Grand Rounds on, "Hyperparathyroidism: A continuing Diagnostic Dilemna".	**1973**
Seventh International Congress of the International Society of Developmental Biologists; panelist on "Cell Surface and Cell Interaction in relation to chondrogenesis".	**1973**
University of Minnesota College of Veterinary Medicine Research Seminar on "Rickets as an experimental model to study calcification by matrix vesicles".	**1974**
Israel Society for Calcified Tissues, International Workshop on Calcified Tissues on "Calcification of rachitic cartilage in vitro as mediated by extracellular matrix vesicles".	**1974**
American Academy of Orthopaedic Surgeons, Program on Basic Science of Bone and Cartilage. Subject: "Histology and Ultrastructure of the Growth Plate".	**1974**
National Institutes of Health, NIDR research seminar on matrix vesicles.	**1974**

INVITED LECTURES:

Second International Santa Catalina Island Colloquium on Extra-cellular Matrix Influences on Gene Expression.	**1974**
31st Annual Meeting of American Institute of Oral Biology. Three lectures on "Induction of Cartilage", "Bone Formation as related to Osteoblast Vesicles" and "Metabolic Bone Disease Processes".	**1974**
Pennsylvania State University, Department of Biophysics research seminar on "The Role of Matrix Vesicles in the Cellular Mediation of Calcification".	**1975**
American Association for Dental Research, symposium on "Mineralization Mechanisms".	**1975**
Johns Hopkins University, Department of Orthopaedics research seminar on "Calcification of Rachitic Cartilage to Study Matrix Vesicle Function".	**1975**
Gordon Research Conference on Chemistry, Physiology and Structure of Bones and Teeth. Chairman of two sessions on "Cellular Control of Mineralization".	**1975**
Hospital for Special Surgery Distinguished Lecture Series "The Healing of Rickets by Calcifying Extra-cellular Matrix Vesicles".	**1976**
Johns Hopkins University and Sinai Hospital of Baltimore postgraduate course on Pathology of Bones and Joints. Guest Faculty. Topic: "The mechanism of calcification in bones and cartilage".	**1976-8**
Rockefeller University, Medical Biochemistry Seminar, "Matrix Vesicles – why calcification?"	**1978**
Gordon Research Conference on Chemistry, Physiology and Structure of Bones and Teeth. Invited lecture on "Matrix Vesicles and Cell Mediated Calcification".	**1979**
Third International Workshop on Bone Histomorphometry. Invited lecture on "The mineralization front".	**1980**
Fourth International Congress on Histochemistry. Invited lecture on "Ultrastructural aspects of mineralization".	**1980**
International Association for Dental Research. Invited lecture on "Mechanisms of biological calcification".	**1981**
American Society for Artificial Internal Organs. Invited lecture on "Normal and abnormal mineralization in mammals".	**1981**
Federation of American Societies for Experimental Biology. Invited to chair a minisymposium on "Calcific Diseases."	**1982**

INVITED LECTURES:

Orthopedic Research Society. Invited to lecture on "Matrix Vesicle Calcification". Selected for the Elizabeth Winston Lanier, Kappa Delta Award.	**1982**
Federation of American Societies for Experimental Biology. Invited to chair a symposium on "Normal biological Calcification".	**1983**
Eighth International Conference on Calcium Regulating Hormones. Co-organizer with Dr. H. Ozawa of a workshop on "Cell mediated Calcification, Matrix Vesicles".	**1983**
Midwest Anatomists Association Symposium speaker on "Mineralization and bone dynamics at the growth plate".	**1984**
National Society for Histotechnology, Tenth Symposium Speaker on "Metabolic bone disease diagnosed by non-decalcified biopsy methods".	**1984**
Second International Conference on Chemistry and Biology of Mineralized Tissue. Invited speaker on "Matrix Vesicles" and Session Chairman on "Calcific Diseases", Gulf Shores, Al.	**1984**
NIH, NHLBI 1984 Devices and Technology Branch Contractors Meeting. Symposium speaker on "Role of membranes in skeletal calcification".	**1984**
Fourth International Conference on Matrix Vesicles. Session Chairperson and Keynote Speaker on "Calcific Diseases".	**1985**
Ninth Annual Christopherson Lectureship on "The Pathogenesis of Calcific Diseases"; sponsored by the William H. Christopherson Society and the University of Louisville School of Medicine.	**1985**
National Institutes of Health, National Institute for Dental Research, on "polarized secretion by MDCK cells in bicameral chambers".	**1985**
American Heart Association Workshop on Evolution of the Human Atherosclerotic Plaque, invited speaker on "Mechanisms of Calcification in Atherosclerosis".	**1986**
Henry D. Moon Memorial Lecturer, Department of Pathology, University of California, School of Medicine, San Francisco.	**1987**
Armed Forces Institute of Pathology course on Atherosclerosis and Heart Disease, invited speaker on "Calcification and Atherosclerosis".	**1987**
Society for Biomaterials, invited lecture on "Similarities between physiological and pathological calcification".	**1987**
British Bone and Tooth Society and British Connective Tissue Society, invited lecture on "mechanism of Mineral Formation in Osteoid of Bone".	**1987**

INVITED LECTURES:

NIH, NHLBI, 1987 Services and Technology Contractors meeting. Symposium speaker on "Mechanisms of Normal and pathologic Calcification". 1987

Conference on Bioactive Factors in Bone Development and Repair. Invited speaker on "Is Matrix Required for bone Induction?" 1988

XIII Congress of the International Society for Heart Research. Chaired symposium on "Cardiovascular Implant Calcification". 1989

Oxford University, MRC Bone Research Lab, Nufield Orthopaedic Centre. Invited speaker on "The role of membranes in the mechanism of normal and pathological calcification". 1990

Invited presentation on "Fluoride", Armed Forces Institute of Pathology and American Registry of Pathology, Environmental Pathology Symposium, Washington, DC. 1991

Chairman and moderator: ASCP/CAP/APC Basic Science symposium on "Intercellular Communications: How cells talk to each other in cancer, tumor cell killing, joint destruction, bone loss and bone repair". New Orleans. 1991

Invited presentation on "The mechanism of bone induction and bone healing by human osteosarcoma cell extracts", Conference on Marrow Stromal Cell Differentiation, Oxford University, England. 1993

Invited presentation on "Aids for fusion: physical and chemical actions". Orthopaedic Research Society, national meeting. 1994

Invited presentation on "Expression of bone morphogenetic proteins by osteoinductive Saos-2 cells". First Internat. Conf. on Bone Morphogenetic Proteins. 1994

Gordon Research Conference on Biomineralization, invited presentation on "Matrix Vesicle Mineralization", Plymouth, NH. 1996

Symposium to commemorate the 50th Anniversary of the Institute of Orthopaedics, Royal National Orthopaedic Hospital. Keynote lecture on "New Research in Orthopaedic Pathology", Stanmore, Middlesex, England. 1997

Invited presentation on "Bone matrix vesicles, their molecular biology and role in bone mineralization", for the Postgraduate Course on Bone Mineralization, University of Antwerp, Belgium 1998

Invited presentation on "BMPs of the growth plate and the osteo-inductive agent of Saos-2 cells", for the University of Paris, Museum d'Histoire Naturelle, Paris France. 1998

INVITED LECTURES:

Invited presentation on “Bone morphogenetic proteins (BMPs) in calcifying matrix vesicles of growth plate”, Gordon Research Conference on Biomineralization. 1998

Invited presentation on “Osseous metaplasia and matrix vesicles in the mechanism of vascular calcification”, UCLA School of Medicine, Division of Cardiology, Los Angeles, CA. 1998

Invited presentation on “Osseous metaplasia and matrix vesicles in the mechanism of vascular calcification” Univ. Washington, Seattle, WA 2000

Invited presentation on “Bone induction and bone healing by Saos-2 Cell products”. Univ. Southampton, England. 2000

Invited presentation on “BMPs of growth plate and matrix vesicles”. Univ. Umea, Sweden. 2000

Invited Presentation on “Hypophosphatasia”. Burnham Cancer Center, La Jolla, CA. 2002

Invited presentation on “BMPs in megakaryocytes and platelets”. ΣXI, KUMC. 2003

Invited presentation on “osteoinduction and bone healing by Saos-2 cell extracts.” City of Hope Cancer Center, Pasadena, CA. 2004

Invited presentation on “Current studies on matrix vesicle-mediated calcification”. Jefferson Medical College, Philadelphia, PA. 2005

Invited presentation on "Mineralization of matrix vesicles in rachitic cartilage." International Workshop on the Skeletal Growth Plate. Stevenson, WA. 2006

Invited presentation on "Matrix vesicle biogenesis and the generation of functional microvesicles by malignant tumor cells." Univ. Missouri Kansas City, School of Dentistry, Kansas City, MO. January 23, 2008.

PATENTS AWARDED

U.S. Patent no 5,035,901, “Bone inducing agent from human osteosarcoma cell line” Inventors: H.C. Anderson, K. Sugamoto. Assignee: The University of Kansas. Date of issue: July 30, 1991.

U.S. Patent no 5,087,573, “Monoclonal antibody against bone alkaline phosphatase.” Inventors: H.C. Anderson and K. Masuhara. Assignee: The University of Kansas. Date of issue: February 11, 1992.

U.S. Patent no 6,020,313, “Method for inducing bone formation using an extract of human osteosarcoma cell line Saos-2” Inventor: H.C. Anderson. Assignee: The University of Kansas. Date of issue: February 1, 2000.

U.S. Patent no 6,322,786 B1, “Method of producing Bone-Inducing Agent”. Inventor: H.C. Anderson. Assignee: The University of Kansas Medical Center, Research Institute, Inc. Date of Issue: November 27, 2001.