

**J. Michael Sorrell
Senior Research
Associate**



EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of Pennsylvania, PA	B.A.	1969	Biology
Temple University, Philadelphia, PA	Ph.D.	1978	Biology

EMPLOYMENT HISTORY

- 1978-1980 University of Pennsylvania, School of Veterinary Medicine, Philadelphia, PA; Postdoctoral Fellow; Department of Animal Biology.
- 1980-1981 Walter Reed Army Institute of Research, Washington, D.C.; Research Associate; Department of Hematology.
- 1981-1982 Ha College, Ha, PA; Assistant Professor; Department of Biology.
- 1982-1985 University of Pennsylvania, School of Veterinary Medicine, Philadelphia, PA; Research Assistant Professor, Department of Animal Biology.
- 1985-1990 West Virginia University, School of Medicine, Mos, WV
- 1985-1986 Research Assistant Professor, Department of Anatomy.
- 1986-1990 Adjunct Assistant Professor, Department of Anatomy.
- 1990-Pres Case Western Reserve University, Cleveland, OH; Senior Research Associate; Department of Biology.

PUBLICATIONS

1. Sorrell, J.M. and Weiss, L. (1980). "Cell Interactions Between Hematopoietic and Stromal Cells in the Embryonic Chick Bone Marrow." *Anat. Rec.* 197:1-19.
2. Sorrell, J.M. and Weiss, L. (1980). "A Light and Electronic Microscopic Study of the Region of Cartilage Resorption in the Embryonic Chick Bone Marrow." *Anat. Rec.* 198:513-530.
3. Sorrell, J.M. and Weiss, L. (1982). "The Cellular Organization of Fibroblastic Cells and Macrophages at Regions of Uncalcified Cartilage Resorption in the Embryonic Chick Femur as Revealed by Alkaline and Acid Phosphatase Histochemistry." *Anat. Rec.* 202:491-499.
4. Sorrell, J.M. and Weiss, L. (1982). "Development of the Embryonic Chick Phagocytic System: Intraembryonic Erythrophagocytosis Induced by Phenylhydrazine." *J. Morphol.* 171:183-194.

5. Sorrell, J.M. and Weiss, L. (1982). "Intercellular Junctions in the Hematopoietic Compartments of Embryonic Chick Bone Marrow." *Am. J. Anat.* 164:57-66.
6. Loewy, A.G., Wilson, F.J., Tagart, N.M., Greene, E.A., Frasca, P., Kaufman, H.S. and Sorrell, J.M. (1983). "A Covalently Cross-Linked Matrix in Skeletal Muscle Fibers." *Cell Motility* 3:463-483.
7. Sorrell, J.M., Voci, M. and Weiss, L. (1987). "Ultrastructural Localization of Heparan Sulfate and Chondroitin Sulfates Associated With Granulopoiesis in Embryonic Chick Bone Marrow." *Am. J. Anat.* 179:186-197.
8. Sorrell, J.M. (1988). "Ultrastructural Localization of Peanut Lectin Binding to Extravascular White Blood Cells in Embryonic Chick Bone Marrow." *Cell Tiss. Res.* 251:301-305.
9. Sorrell, J.M. (1988). "Ultrastructural Localization of Fibronectin in Embryonic Chick Bone Marrow and Its Relationship to Granulopoiesis." *Cell Tiss. Res.* 252:565-571.
10. Sorrell, J.M., Mahmoodian, F. and Caterson, B. (1988). "Immunochemical Characterization and Ultrastructural Localization of Chondroitin Sulfates and Keratan Sulfate in Embryonic Chick Bone Marrow." *Cell Tiss. Res.* 252:523-531.
11. Sorrell, J.M. (1988). "Development of Arteries in Embryonic Chick Bone Marrow: With Special Reference to the Appearance of Periarterial Granulopoietic Sheaths." *Anat. Rec.* 221:730-736.
12. Sorrell, J.M., Lintala, A.M., Mahmoodian, F. and Caterson, B. (1988). "Epitope-Specific Changes in Chondroitin Sulfate/Dermatan Sulfate Proteoglycans as Markers in the Lymphopoietic and Granulopoietic Compartments of Developing Bursae of Fabricius." *J. Immun.* 140:4263-4270.
13. Sorrell, J.M., Mahmoodian, F. and Caterson, B. (1988). "Immunochemical and Biochemical Comparisons Between Embryonic Chick Bone Marrow and Epiphyseal Cartilage Chondroitin/Dermatan Sulfate Proteoglycans." *J. Cell Sci.* 91:81-90.
14. Sorrell, J.M. and Caterson, B. (1989). "Detection of Age-Related Changes in the Distributions of Keratan Sulfates and Chondroitin Sulfates in Developing Chick Limbs: An Immunocytochemical Study." *Devel.* 106:657-663.
15. Sorrell, J.M., Mahmoodian, F., Schafer, I.A., Davis, B.R. and Caterson, B. (1990). "Identification of Monoclonal Antibodies that Recognize Novel Epitopes in Native Chondroitin/Dermatan Sulfate Glycosaminoglycan Chains: Their Use in Mapping Functionally Distinct Domains of the Human Skin." *J. Histochem. Cytochem.* 38:393-402.
16. Sorrell, J.M., Caterson, B., Davis, B.R. and Schafer, I.A. (1990). "Human Keratinocytes Contain Carbohydrates That Are Recognized by Keratan Sulfate-Specific Monoclonal Antibodies." *J. Invest. Derm.* 95:347-352.
17. Sorrell, J.M. and Caterson, B. (1990). "Monoclonal Antibodies Specific for Keratan Sulfate Detect Epithelial-Associate Carbohydrates." *Histochem.* 94:269-277.
18. Adany, R., Heimer, R., Caterson, B., Sorrell, J.M. and Iozzo, R.V. (1990). "Altered Expression of Chondroitin Sulfate Proteoglycan in the Stroma of Human Colon Carcinoma. Hypomethylation of PG-40 Gene Correlates With Increased PG-40 Content and mRNA levels." *J. Biol. Chem.* 265:11389-11396.
19. Caterson, B., Mahmoodian, F., Sorrell, J.M., Hardingham, T.E., Bayliss, M.T., Carney, S.L., Ratcliffe, A. and Muir, H. (1990). "Modulation of Native Chondroitin Sulphate Structure in Tissue Development and in Disease." *J. Cell Sci.* 97:411-417.

20. Caterson, B., Griffin, J., Mahmoodian, F. and Sorrell, J.M. (1990). "Monoclonal Antibodies Against Chondroitin Sulfate Isomers: Their Use as Probes for Investigating Proteoglycan Metabolism." *Biochem. Soc. Trans.* 18:820-823.
21. Perris, R., Krotoski, D., Lallier, T., Domingo, C., Sorrell, J.M. and Bronner-Fraser, M. (1991). "Spatial and Temporal Changes in the Distribution of Proteoglycans During Avian Neural Crest Development." *Devel.* 111:583-599.
22. Willen, M.D., Sorrell, J.M., Lekan, C.C., Davis, B.R. and Caplan, A.I. (1991). "Aging Patterns of Proteoglycan Immunostaining in Human Skin." *J. Invest. Derm.* 96:968-974.
23. Schafer, I.A. and Sorrell, J.M. (1993) "Human Keratinocytes Contain Keratin Filaments that are Glycosylated with Keratan Sulfate." *Exp. Cell Res.* 207:213-219.
24. Boyce, S.T., Greenhalgh, D.G., Kagan, R.J., Housinger, T., Sorrell, J.M., Childress, C. P., Rieman, M., and Warden, G.D. Skin Anatomy and antigen expression after burn wound closure with composite grafts of cultured skin cells and biopolymers. *Plast. Reconstr. Surg.*, 91:632-641, 1993.
25. Sorrell, J.M., Carrino, D.A. and Caplan, A.I. (1993) "Structural Domains in Chondroitin Sulfate Identified by Antichondroitin Sulfate Monoclonal Antibodies. Immunosequencing of Chondroitin Sulfates." *Matrix* 13:351-361.
26. Vivier, E., Sorrell, J.M., Ackerly, M., Robertson, M.J., Rasmussen, R.A., Levine, H. and Anderson, P. (1993) "Developmental Regulation of a Mucin-like Glycoprotein in Selectively Expressed on Natural Killer Cells." *J. Exp. Med.* 178:2023-2033.
27. Hascall, V.C., Midura, R.J., Sorrell, J.M., and Plaas A.H.K. (1995) "Immunology of Chondroitin/Dermatan Sulfate." *Adv. Exp. Med. Biol.*, 376:205-216.
28. Sorrell, J.M., Baber, M.A., and Caplan, A.I. (1996) "Construction of a Bi-layered Dermal Equivalent Containing Human Papillary and Reticular Dermal Fibroblasts: Use of Fluorescent Vital Dyes." *Tissue Engineering*, 2:39-49.
29. Olsson, L., Stigson, M., Perris, R., Sorrell, J.M., and Lofberg, J. (1996) "Distribution of Keratan Sulphate and Chondroitin Sulphate in Wild Type and White Mutant Axolotl Embryos during Neural Crest Cell Migration." *Pig. Cell Res.*, 9:5-17.
30. Sorrell, J.M., Carrino, D.A., and Caplan, A.I. (1996) "Regulated Expression of Chondroitin Sulfates at Sites Epithelial/Mesenchymal Interaction: Spatio-Temporal Patterning Identified with Antichondroitin Sulfate Monoclonal Antibodies." *Int. J. Neurosci.*, 14:233-249, 1996.
31. Sorrell, J.M., Carrino, D.A., Baber, B.A., and Caplan, A.I. (1999) "Versican in Human Fetal Skin Development." *Anat. Embryol.*, 199:45-56.
32. Carrino, D.A., Sorrell, J.M., Caplan, A.I. (1999) "Dynamic Expression of Proteoglycans during Chicken Skeletal Muscle Development and Maturation." *Poultry Sci.*, 78:769-777.
33. Sorrell, J.M., Carrino, D.A., Baber, B.A., Asselineau, D.A and Caplan, A.I. (1999) "Monoclonal Antibody PG-4 Recognizes a Glycosaminoglycan Epitope Found on both Dermatan Sulfate and Chondroitin Sulfate Proteoglycans in Human Skin." *Histochemical J.* 31:549-558.
34. Sorrell, J.M., Carrino, D.A., Caplan, A.I. (2000) " Developmental and aging changes of chondroitin/dermatan sulfate proteoglycans. " in: *Oligosaccharides in Chemistry and Biology: A Comprehensive*

Handbook, eds., Ernst, B., Hart, G., and Sinay, P., Wiley-VCH, pp. 730-742.

35. Carrino, D.A., Sorrell, J.M., and Caplan, A.I. (2000) " Age-related changes in the proteoglycans of human skin." *Arch. Biochem. Biophys.*, 373:91-101.
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37. Sorrell, J.M., Brinon, L., Baber, M.A., and Caplan, A.I. (2003) Cytokines and glucocorticoids differentially regulate APN/CD13 and DPPIV/CD26 enzyme activities in cultured human dermal fibroblasts. *Arch. Dermatol. Res.*, 295:160-168.
38. Sorrell, J.M., Seavolt, M.B., Baber, M.A., Carrino, D.A., Asselineau, D.A., and Caplan, A.I. (2003) Production of a Monoclonal Antibody, DF-5, that Identifies Cells at the Epithelial/Mesenchymal Interface in Normal Human Skin. APN/CD13 is an Epithelial/Mesenchymal Marker in Skin. *Exp. Derm.*, 12:315-323.
39. Sorrell, J.M., Baber, M.A., and Caplan, A.I. (2004) Site-matched papillary and reticular human dermal fibroblasts differ in their release of specific growth factors/cytokines and in their interaction with keratinocytes. *J. Cell. Physiol.*, 200:134-145.
40. Sorrell, J.M. and Caplan, A.I. (2004) Fibroblast heterogeneity: more than skin deep. *J. Cell Sci.*, 117:667-675.
41. Sorrell, J.M., Baber, M.A., and Caplan, A.I. (2007) Clonal Characterization of Fibroblasts in the Superficial Layer of the Adult Human Dermis. *Cell Tis. Res.*, 327:499-510.
42. Sorrell, J.M., Baber, M.A., and Caplan, A.I. (2007) A Self-Assembled Fibroblast-Endothelial Cell Co-Culture System that Supports In Vitro Vasculogenesis by both Human Umbilical Vein Endothelial Cells and Human Dermal Microvascular Endothelial Cells. *Cells, Tissues, Organs*, 186:157-168.
43. Sorrell, J.M., Baber, M.A., and Caplan, A.I. (2008) Human Dermal Fibroblast Subpopulations; Differential Interactions with Vascular Endothelial Cells in Co-Culture. Non-Soluble Factors in the Extracellular Matrix Influence Interactions. *Wound Repair Regen*, 16:300-309.
44. Sorrell, J.M., Baber, M.A., and Caplan, A.I. (2009) Influence of adult mesenchymal stem cells on in vitro vascular formation. *Tissue Eng Part A*. 15(7):1751-61.
45. Sorrell, J.M., Caplan AI (2009) Fibroblasts- a diverse population at the center of it all. *Int Rev Cell Mol Biol*. 276:161-214.
46. Sorrell, J.M. and Caplan, A.I. (2010) Topical delivery of mesenchymal stem cells and their function in wounds. *Stem Cell Res Ther*. 1(4):30
47. Carrino, D.A., Calabro, A., Darr, A.B., Dours-Zimmermann, M.T., Sandy, J.D., Zimmermann, D.R., Sorrell, J.M., Hascall, V.C., and Caplan, A.I. (2011) Age-related differences in human skin proteoglycans. *Glycobiology*. 21(2):257-68.