

CURRICULUM VITAE

NAME

Ruth Austad Altschuld

EDUCATION

Ohio University 1957-1961 B.S. Zoology (Medical Technology)
Ohio State University 1961-1962 M.S. Clinical Pathology
Ohio State University 1962-1966 Ph.D. Physiological Chemistry

POSITIONS HELD

1961-1962	Research Assistant, Ohio State University (OSU) Department of Pathology.
1962-1963	Teaching Assistant, OSU Department of Physiological Chemistry.
1963-1966	Pre-doctoral fellow, OSU Department of Physiological Chemistry. Fellowship support from the department (1963 - 1965) and NIH (1966).
1967-1969: (full time) 1969-1971: (50% time)	Research Associate, Instructor, OSU Department of Internal Medicine, Division of Cardiology.
1972-1975: (50% time)	Research Associate, OSU Department of Physiological Chemistry.
1975-1978: (50% time) 1978-1982: (75% time)	Adjunct Assistant Professor, OSU Department of Physiological Chemistry.
1982-1989: (full time)	Research Scientist, OSU Department of Physiological Chemistry.
1985-1989	Research Scientist, OSU Department of Internal Medicine, Division of Cardiology.
1989-1995	Associate Professor, OSU Department of Medical Biochemistry (tenured in 1991).
1995-present	Professor, OSU Department of Medical Biochemistry (renamed Department of Molecular and Cellular Biochemistry in 2000)

MEMBERSHIPS

American Association for Biochemistry and Molecular Biology
 American Physiological Society
 Biophysical Society
 International Society for Heart Research
 American Heart Association - Basic Science Council
 Sigma Xi
 AAAS
 Heart Failure Society of America

EDITORIAL BOARDS

7/97-12/98 American Journal of Physiology (Heart and Circulatory Physiology)

AD HOC JOURNAL REVIEWER

Journal of Clinical Investigation
 American Journal of Physiology
 Circulation Research
 Archives of Biochemistry and Biophysics
 Journal of Molecular and Cellular Cardiology
 Science
 Pflügers Archives
 Lipids
 Life Sciences
 Journal of Comparative Physiology
 Cardiovascular Research
 Hypertension
 Journal of Laboratory and Clinical Medicine
 Journal of Biological Chemistry
 Molecular and Cellular Biochemistry
 Circulation
 Biophysical Journal
 Journal of the American College of Cardiology
 Research Communications in Molecular Pathology and
 Pharmacology
 Biochemical Pharmacology
 Journal of Hypertension

INVITED SYMPOSIUM SPEAKER

1968 New York Academy of Sciences Symposium on Phenformin
 1979 Heart Creatine Kinase: The Integration of Isozymes for Energy
 Distribution - Baltimore, MD
 1984 Isolated Adult Cardiomyocytes - Lake Titisee, F.R.G.

- 1987 Biology of Isolated Adult Cardiomyocytes - Asilomar, CA
- 1989 Energetics and Myocardial Ionic Homeostasis - Baltimore, MD
- 1990 Isolated Myocytes from Failing Hearts - British Society for Cardiovascular Research, London
- 1991 Calcium Homeostasis in Cardiac Myocytes - American Section of the International Society for Heart Research - Cincinnati
- 1991 Isolated Myocytes and the Calcium Paradox – Satellite Conference on the Calcium Paradox, Utrecht, The Netherlands
- 1991 Ca²⁺ Handling and β -Adrenergic Function in Myocytes from Heart Failure-Prone Rats - European Section of the International Society for Heart Research, Leuven, Belgium
- 1992 Characterization of the Energy Metabolism in DCM by HPLC Analysis in Myocardial Biopsies - International Symposium on Myocarditis - Dilated Cardiomyopathy: Pathogenesis and Clinical Implications, Düsseldorf, Germany
- 1994 Cardiac Myocytes and Heart Failure - International Society for Heart Research - American Section - London Ontario
- 1994 International Workshop on Cardiac Cells in Culture: a Model System Between Basic and Clinical Research. European Society of Cardiology Working Group: Cellular Biology of the Heart. Monte Verità, Ascona, Switzerland
- 1997 Gordon Conference – Muscle Contractility – Contractility of the Failing Heart
- 1998 International Society for Heart Research, Ixia, Rhodes, Greece
- 1998 AHA Basic Science Council-sponsored pre-session, Dallas
- 2000 International Society for Heart Research, American Section, June 14-18, Louisville, KY

INVITED SEMINAR SPEAKER

- 1976 University of Indiana, Department of Biochemistry
- 1983 University of Pennsylvania, Department of Biochemistry and Biophysics
- 1984 Diabetes-Forschungsinstitut, Universität Düsseldorf, F.R.G.
- 1989 University of Cincinnati, Department of Pathology
- 1991 Wright State University Department of Biochemistry
- 1992 Ohio State University Biophysics Program

1992 Case Western Reserve University Department of Physiology and Biophysics
 1992 Diabetes-Forschungsinstitut, Universitat Düsseldorf, Germany
 1994 University of Cincinnati, Cell Biophysics and Division of Cardiology
 1996 Wayne State University, Cardiovascular Research Group
 1997 NEOUCOM Department of Physiology
 1997 Cleveland Clinic Heart Failure Group
 1999 University of Illinois at Chicago, Department of Physiology and Biophysics

GRANT SUPPORT:

1968-1969 Central Ohio Heart Chapter (C.O.H.C.) Stimulation of ATP Generation in the Anoxic Myocardium. \$7277.
 1970-1971 C.O.H.C. The Effect of Fatty Acids on Performance and Metabolism of the Anoxic Heart, \$7000.
 1974-1975 C.O.H.C. Biochemical Events Underlying Injury to Ischemic Myocardium. \$7455.
 1975-1976 C.O.H.C. Magnesium and Cardiac Energy Metabolism. \$7495
 1976-1977 C.O.H.C. Control of Cardiac Energy Metabolism. \$7500
 1977-1978 C.O.H.C. Compartmentation of K⁺ in Cardiac Cells. \$9000
 1978-1979 C.O.H.C. Studies of the Heart Mitochondrial K⁺ Binding Proteolipid, \$11,000. K.M. Scott, Co-investigator.
 1981-1982 C.O.H.C. Localization of Calcium in Isolated Heart Cells \$17,796. C. Capen, Co-investigator
 1982-1984 C.O.H.C. Patterns of Enzyme Release from Myocardial Cells \$36,000
 1984-1985 C.O.H.C. Hypercontracture of Isolated Adult Rat Heart Myocytes. \$22,500
 1985-1986 C.O.H.C. Calcium Transport Reactions in Ischemic Myocytes \$20,000
 1986-1987 C.O.H.C. Biochemical Characterization of Human Cardiomyopathy. \$25,000
 1987-1988 C.O.H.C. Metabolism of Myocytes Isolated from Hyperthyroid Adult Rats. \$22,000
 1988-1989 C.O.H.C. Metabolic and Hormonal Control of Myocardial Adenylate Deaminase. \$25,000

- 1989-1991 HL36240 Cardiac Myocytes and Cellular Response to Ischemia
G.P. Brierley - principal investigator, R.A. Altschuld - Co-principal investigator
- 1989-1992 A.H.A. Ohio Affiliate - Isolated Myocytes from Rats with Congestive Heart Failure. \$60,000
- 1991-1994 A.H.A. National - Isolated Myocytes from Failing Human Ventricle. \$120,000
- 1991-1999 HL36240 Cardiac Myocytes and Cellular Response to Ischemia
R.A. Altschuld, Principal Investigator, \$175,635/FY '97 direct. Includes Minority Supplement for Cynthia Carnes, \$150,000 direct, 1996-1999.
- 1992-2001 HL48835 The Sarcoplasmic Reticulum in Dilated Cardiomyopathy, R.A. Altschuld, Principal Investigator, \$183,000/FY '99 direct costs.
- 2000-2003 DK33727 Modulation of Calmodulin and the Calcium Signal, R.A. Altschuld, Principal Investigator, \$134,371/FY'00 direct costs.

PROFESSIONAL AND COLLEGE SERVICE

- 1998-1999 American Heart Association (AHA) National Peer Review Committee (Cell Transport and Metabolism)
- 1998-2001 Ohio Valley AHA Research Steering Committee and Peer Review Committee
- 1998-present Biophysics Program Curriculum Committee
- 1998 USPHS-NIH Physiological Chemistry Study Section, Ad Hoc Reviewer
- 1998 OSU College of Medicine Tenure and Promotion Committee
- 1994-present National Health Assistance Foundation Advisory Board
- 1992-1996 USPHS-NIH Cardiovascular and Pulmonary Study Section
- 1993-1994 USPHS-NIH Cardiovascular SCOR Parent Committee
- 1993 USPHS-NIH Special Cardiovascular Study Section
- 1993-present Ad Hoc Reviewer, VA Merit Review
- 1993-1999 Executive Committee, AHA Basic Science Council
- 1993-1999 Associate Editor, Editor, AHA Basic Science Council Newsletter
- 1993-1995 Sigma Xi, Ohio State Chapter Executive Committee
- 1993 USPHS-NIH Site Visit Reviewer, Iowa City PPG
- 1992-1993 Ohio State Biochemistry Program, Admissions Committee

1993 Ohio State Biochemistry Program, Curriculum Committee

1991-1994 College of Medicine Animal Review Committee, Co-Chair

1990 College of Medicine Animal Review Committee

1989-1993 College of Medicine Graduate Education Committee

1989 USPHS-NIDA Special Review Committee

1989-1992 American Heart Association, Ohio Affiliate Research Steering Committee

1989-1992 American Heart Association, Central Ohio Service Area, Chairman, Research Committee

1988-1993 American Heart Association, Central Ohio Service Area Research Committee

1987-1988 Department of Internal Medicine, Division of Cardiology Research Committee

1986-1990 American Heart Association, Ohio Affiliate Research Committee

1986-1988 American Heart Association, Franklin County Program Committee chair

1983-1986 American Heart Association, Central Ohio Heart Chapter Research Committee

1982-1990 American Heart Association, Franklin County Board of Trustees

GRADUATE STUDENTS

1986 Richard S. Vander Heide, Ph.D., M.D. Northwestern University Medical School, Department of Pathology, graduate committee member

1989 Anthony P. Timerman, Ph.D., Ohio State Biochemistry Program, graduate committee member

1990 Dorothy K. Wimsatt, Ph.D., Pathology, Co-advisor

1990 Bo Hu, Ph.D., Ohio State Biochemistry Program, Advisor

1990 Myung Kim-Lee, Ph.D., Physiology, committee member

1991 Jane C.J. Chao. Ph.D., Human Nutrition, committee member

1992 Beth Livingston, M.S., Ohio State Biochemistry Program, Advisor

1992 Ron Philips, Ph.D., Ohio State Biochemistry Program, Advisor

1992 Todd Whitacre, Ph.D. candidate, Ohio State Biochemistry, Program, Advisor

1992 Prakash Narayan, Ph.D. Ohio State Biophysics Program, Advisor

1993 Kamal Baysal, Ph.D., Ohio State Biochemistry Program, committee member

1993 Adrienne Aldous, Ph.D., Human Nutrition, committee member

1993 Mike Lappi, Ph.D., Department of Physiology, committee member

1993 Mike O'Donnell, Ph.D., Biophysics Program, committee member

1993 Robin Nakkula, M.S., Biophysics Program, committee member

1993 Beiqing Liu, Medical Biochemistry, committee member

1993 Yandong Liang, Ph.D. Medical Biochemistry, committee member

1993 Gail Duda, Ohio State Biochemistry Program, committee member

1994 Selma Mohammed, M.D., Ph.D. Medical Biochemistry, committee member

1996 Cristian Dumitrescu, Ph.D. candidate, Biophysics Program, advisor

1996 Fan Rong, M.S., Pharmacology, committee member

1996 Janet Russell, Ph.D., Ohio State Biochemistry Program, committee member

1997 Melanie Houle, Ph.D., Physiology Department, committee member

1997 Patrick Bradshaw, Ph.D. candidate, OSBP, committee member

1997 Matt Budny, Ph.D. candidate, OSBP, committee member

1998 Jonathan Davis, Ph.D., Biophysics Program, committee member

1998 Brian Palmer, Ph.D. candidate, Biophysics Program, advisor

1998 Svetlana Tikunova, Ph.D. candidate, Biophysics Program, advisor

1999 Brian Hood, OSBP, Ph.D. candidate, committee member

1999 Don Black, OSBP, PH.D. candidate, advisor

POST-DOCTORAL FELLOWS

1983-1985 Mindy R. Lambert, Ph.D., C.O.H.C. Fellow

1988-1990 Qian Li, Ph.D., A.H.A., Ohio Affiliate Fellow

1993 Kemal Baysal, M.D., Ph.D.

PUBLICATIONSA. REFEREED ARTICLES

1. Meyers, M.B., Lee, P.C., Altschuld, R.A., Moravec, C.S., Bové, M., McCune, S.A. and Fishman, G.I. (2000). Abnormal localization of sorcin in the failing rat and human heart. *Circ. Res.* (in review).
2. Altschuld, R.A. and Billman, G.E.(2000) β_2 -Adrenoceptors and ventricular fibrillation. *Pharmacology. & Therapeutics* (in press).
3. Hohl, C.M. and Altschuld, R.A. (1999) FK506 alters sarcoplasmic reticulum calcium release in neonatal piglet cardiac myocytes. *Pediatr. Res.* 46: 316-319.
4. Pérez, N.G., Hashimoto, K., McCune, S., Altschuld, R.A., and Marbán, E. (1999) Origin of contractile dysfunction in heart failure. Calcium cycling versus myofilaments. *Circulation* 99: 1077-1083.
5. Matlib, A.M., Zhou, Z., Knight, S., Ahmed, S., Choi, K.M., Krause-Bauer, J., Phillips, R., Altschuld, R., Katsube, Y., Sperelakis, N., and Bers, D.M. (1998) Oxo-bridged dinuclear ruthenium ammine complex specifically inhibits Ca^{2+} uptake into mitochondria in vitro and in situ in single cardiac myocytes. *J. Biol. Chem.* 273: 10223-10231.
6. O'Donnell, J.M., Narayan, P., Bailey, M.Q., Abduljalil, A.M., Altschuld, R.A., McCune, S.A., and Robitaille, P.-M. (1998) ^{31}P -NMR analysis of congestive heart failure in the SHHF/Mcc-*fa*^{cp} rat heart. *J. Mol. Cell. Cardiol.* 30: 235-241.
7. Phillips, R.M., Narayan, P., Gómez, A., Jones, L.R., Lederer, R.J. Altschuld, R.A. (1998) Sarcoplasmic reticulum in heart failure: central player or bystander? *Cardiovasc. Res.* 37:346-351.
8. Starling, R.C., Hammer, D.F., and Altschuld, R.A. (1998). Human myocardial ATP content and in vivo contractile function. *Mol. Cell. Biochem.* 180:171-177.
9. Kolattukudy, P.E., Quach, T., Bergese, S., Breckendridge, S., Hensley, J., Altschuld, R.A., Gordillo, G., Klenotic, S., Orosz, C., and Parker-Thornburg, J. (1998) Myocarditis induced by targeted expression of MCP-1 gene in mice cardiac muscle. *Am. J. Pathol.* 152:101-111.
10. Billman, G.E., Castillo, L.C., Hensley, J., Hohl, C.M., and Altschuld, R.A. (1997) β_2 -Adrenergic receptor antagonists protect against ventricular fibrillation: in vivo and in vitro evidence for enhanced sensitivity to β_2 -adrenergic stimulation in animals susceptible to sudden death. *Circulation* 96: 1914-1922.
11. Gómez, A.M., Valdivia, H.H., Cheng, H., Lederer, M., Santana, L.F., Cannell, M.B., McCune, S.A., Altschuld, R.A., Lederer, W.J. (1997) Defective excitation-contraction coupling in cardiac hypertrophy and heart failure. *Science* 276: 800-806.
12. Zhou, Y.-Y., Cheng, H., Bogdanov, K.Y., Hohl, C., Altschuld, R., Lakatta, E.G., and Xiao, R.P. (1997) Localized cAMP-dependent signaling mediates β_2 -adrenergic modulation of cardiac excitation-contraction coupling. *Am. J. Physiol.* 273: H1611-H1618.
13. Pepe, S., Xiao, R.-P., Hohl, C.M., Altschuld, R.A., and Lakatta, E.G. (1997) "Cross-talk" between opioid peptide and adrenergic receptor signaling in isolated rat heart. *Circulation* 95: 2122-2129.

14. Hohl, C.M., Livingston, B., Hensley, J., and Altschuld, R.A. (1997) Calcium handling by the sarcoplasmic reticulum of neonatal swine cardiac myocytes. *Am. J. Physiol.* 273: H192-H199.
15. Park, S., McCune, S.A., Radin, M.J., Hoepf, T.M., Hensley, J., Hohl, C.M., and Altschuld, R.A. (1997) Verapamil accelerates the transition to heart failure in obese, hypertensive, female SHHF/Mcc-*fa^{cp}* rats. *J. Cardiovasc. Pharmacol.* 29:726-733.
16. Hensley, J., Billman, G.E., Johnson, J.D., Hohl, C.M., and Altschuld, R.A. (1997) Effects of calcium channel antagonists on Ca²⁺ transients in rat and canine cardiomyocytes. *J. Mol. Cell. Cardiol.* 29: 1037-1043.
17. Altschuld R.A. (1996) Intracellular calcium regulatory systems during ischemia and reperfusion. *EXS.* 76:87-97.
18. Phillips, R.M. and Altschuld, R.A. (1996) 2,3-Butanedione 2-monoxime induces calcium release from canine cardiac sarcoplasmic reticulum. *Biochem. Biophys. Res. Commun.* 229: 154-157.
19. Livingston, B.E., Altschuld, R.A., and Hohl, C.M. (1996) Metabolic compartmentalization in neonatal swine myocytes. *Pediatr. Res.* 40:59-65.
20. Altschuld, R.A., Starling, R.C., Hamlin, R.L., Billman, G.E., Hensley, J., Castillo, L., Fertel, R.H., Hohl, C.M., Robitaille, P.-M.L., Jones, L.R., Xiao, R.-P., and Lakatta, E.G. (1995) Response of failing canine and human heart cells to β_2 -adrenergic stimulation. *Circulation* 92:1612-1618.
21. Narayan, P., McCune, S.A., Robitaille, P.-M.L., Hohl, C.M., and Altschuld, R.A. (1995) Mechanical alternans and the force frequency relationship in failing rat hearts. *J. Mol. Cell. Cardiol.* 27: 523-530.
22. Xiao, R.-P., Hohl, C.M., Altschuld, R.A., Jones, L., Livingston, B., Ziman, B., Tantini, B., and Lakatta, E.G. (1994) β_2 -Adrenergic receptor stimulated increase in cAMP in rat heart cells is not coupled to changes in Ca²⁺ dynamics, contractility, or phospholamban phosphorylation. *J. Biol. Chem.* 269: 19151-19156.
23. Altschuld, R.A., Jung, D.W., Phillips, R.M., Narayan, P., Castillo, L.C., Whitaker, T.E., Hensley, J., Hohl, C.M., and Brierley, G.P. (1994) Evidence against norepinephrine stimulated efflux of mitochondrial Mg²⁺ from intact cardiac myocytes. *Am. J. Physiol.* 266: H1103-H1111.
24. Jurkowitz-Alexander, M.S., Altschuld, R.A., Haun, S.E., Stephens, R.E., and Horrocks, L.A. (1993) Protection of ROC-1 hybrid glial cells by polyethylene glycol following ATP depletion. *J. Neurochem.* 61:1581-1584.
25. Hu, B., Altschuld, R.A., and Hohl, C.M. (1993) Adenosine stimulation of AMP deaminase activity in adult rat cardiac myocytes. *Am. J. Physiol.* 264:C48-C53.
26. Hohl, C.M., Hu, B., Fertel, R.H., Russell, J.C., McCune, S.A., and Altschuld, R A. (1993) Effects of Obesity and Hypertension on Ventricular Myocytes: A Comparison of Cells from Adult SHHF/Mcc-*cp* and JCR:LA-*cp* Rats. *Cardiovasc. Res.* 27:238-242.
27. Chao, J.C.J, Medeiros, D.M., Altschuld, R.A., and Hohl, C.M. (1993) Cardiac nucleotide levels and mitochondrial respiration in copper-deficient rats. *Comp. Biochem. Physiol.* 104A:163-168.
28. Altschuld, R.A., Hohl, C.M., Castillo, L.C., Garleb, A.A., and Brierley, G.P. (1992) Cyclosporine inhibits mitochondrial calcium efflux in isolated adult rat ventricular cardiomyocytes. *Am. J. Physiol.* 262:H1699-H1704.
29. Jurkowitz-Alexander, M.S., Altschuld, R.A., Hohl, C.M., Johnson, J.D., McDonald, J.S., Simmons, T.D. and Horrocks, L.A. (1992) Bleb formation and cell death are dependent on ATP depletion and independent of

- calcium during chemical hypoxic injury in ROC-1 cells. *J. Neurochem.* 59:344-452.
30. Hohl, C.M., Garleb, A.A. and Altschuld, R.A. (1992) Effects of simulated ischemia and reperfusion on the sarcoplasmic reticulum of digitonin-lysed cardiomyocytes. *Circ. Res.* 70:716-723.
 31. Hu, B., Altschuld, R.A. and Hohl, C.M. (1991) Phorbol esters and cyclic AMP activate AMP deaminase in adult rat cardiac myocytes. *Arch. Biochem. Biophys.* 291:100-106.
 32. Altschuld, R.A., Ganote, C.E., Nayler, W.G. and Piper, H.M. (1991) What constitutes the calcium paradox: J. *Mol. Cell. Cardiol.* 23:765-768.
 33. Hohl, C.M. and Altschuld, R.A. (1991) Response of isolated adult canine cardiac myocytes to prolonged hypoxia and reoxygenation. *Am. J. Physiol.* 260:C383-C391.
 34. Stokes, B.T., Altschuld, R.A., Hohl, C.M., Li, Q., and Anderson, D.K. (1991) Energy depletion in culture: Adenine nucleotides are altered as in vivo. *Mol. Chem. Neuropath.* 15:29-35.
 35. Wimsatt, D.K., Hohl, C.M., Brierley, G.P. and Altschuld, R.A. (1990) Calcium accumulation and release by the sarcoplasmic reticulum of digitonin-lysed adult mammalian ventricular cardiomyocytes. *J. Biol. Chem.* 265, 14849-14857.
 36. Neumar, R.W., Brown, C.G., Van Ligten, P., Hoekstra, J., Altschuld, R.A. and Baker, P. (1990) Estimation of myocardial ischemic injury during ventricular fibrillation with total circulatory arrest using high energy phosphates and lactate as metabolic markers. *Ann. Emerg. Med.* 20:222-229.
 37. Pap, J.M., Hammer, D.F., Fry, D.L., Kelley, R. and Altschuld, R.A. (1990) Nucleotide profiles in normal minipig arterial tissue. *Arteriosclerosis* 10:745-750.
 38. Timerman, A.P., Altschuld, R.A., Brierley, G.P. and Merola, A.J. (1990) Hypercontracture of isolated adult rat myocytes induced by glutathione depleting agents. *J. Mol. Cell. Cardiol.* 22, 565-575.
 39. Rim, D., Altschuld, R. and Ganote, C. (1990) Effects of calcium depletion and loading on irreversible injury in isolated adult rat myocytes. *J. Mol. Cell. Cardiol.* 22, 227-237.
 40. Hohl, C.M., Hu B., Wimsatt, D.K., Fertel, R.H., Starling, R.C., Brierley, G.P., Altschuld, R.A: Isolated myocytes from a normal human heart. *Progress in Clinical & Biological Research* 1990;327:735-742.
 41. Li, Q., Biagi, B., Hohl, C., Starling, R., Stokes, B., Altschuld, R.A. Effects of isoproterenol and caffeine on calcium transients and action potentials in human ventricular cardiomyocytes. *Progress in Clinical & Biological Research* 1990;327:743-750.
 42. Hohl, C.M., Wetzel, S., Fertel, R.H., Wimsatt, D.K., Brierley, G.P. and Altschuld, R.A. (1989) Hyperthyroid Adult Rat Cardiomyocytes: I. Nucleotide Content, Beta and Alpha Adrenoreceptors and Cyclic AMP Production. *Am. J. Physiol.* 257, C948-C956.
 43. Li, Q., Guan, Z., Biagi, B.A., Stokes, B.T. and Altschuld, R.A. (1989) Hyperthyroid Adult Rat Cardiomyocytes: II. Single Cell Electrophysiology and Free Calcium Transients. *Am. J. Physiol.* 257, C957-C963.

44. Ralston, M.A., Murnane, M.R., Unverferth, M.D., Altschuld, R.A., Kelley, R.E., and Leier, C.V. (1989) Serum, circulating mononuclear cell, skeletal muscle, and myocardial magnesium. *Circulation* 80, 573-580.
45. Li, Q., Hohl, C.M., Altschuld, R.A. and Stokes, B.T. (1989) Energy depletion/repletion and calcium transients in single cardiomyocytes. *Am. J. Physiol.* 257, C427-C434.
46. Hohl, C.M., Wimsatt, D.K., Brierley, G.P. and Altschuld, R.A. (1989) IMP production by ATP-depleted adult rat heart cells: effects of glycolysis and α_1 -adrenergic stimulation. *Circ. Res.* 65, 754-760.
47. Li, Q., Stokes, B.T., and Altschuld, R.A. (1989) Comments on quantitation of intracellular free calcium in single adult cardiomyocytes by fura-2 fluorescence microscopy. *Cell Calcium* 10, 264.
48. Li, Q., Altschuld, R.A. and Stokes, B.T. (1988) Myocyte deenergization and intracellular free calcium dynamics. *Am. J. Physiol.* 255, C162-C168.
49. Hammer, D.F., Unverferth, D.V., Kelley, R.E., Harvan, P.A. and Altschuld, R.A. (1988) Extraction and measurement of myocardial nucleotides, nucleosides, and purine bases by high-performance liquid chromatography. *Anal. Biochem.* 169,
50. Davis, M.H., Altschuld, R.A., Jung, D.W. and Brierley, G.P. (1987) Estimation of intramitochondrial pCa and pH by fura-2 and 2,7 biscarboxyethyl-5(a)-carboxyfluorescein (BCECF) fluorescence. *Biochem. Biophys. Res. Commun.* 149, 40-45.
51. Altschuld, R.A., Gamelin, L.M., Kelley, R.E., Lambert, M.R., Apel, L.E. and Brierley, G.P. (1987) Degradation and resynthesis of adenine nucleotides in adult rat myocytes. *J. Biol. Chem.* 262, 13527-13533.
52. Li, Q., Altschuld, R.A. and Stokes, B.T. (1987) Quantitation of intracellular free calcium in single adult cardiomyocytes by fura-2 fluorescence microscopy: calibration of fura-2 ratios. *Biochem. Biophys. Res. Commun.* 147, 120-126.
53. Vander Heide, R.S., Angelo, J.P., Altschuld, R.A., and Ganote, C.E. (1986). Energy dependence of contraction band formation in perfused hearts and isolated adult myocytes. *Am. J. Pathol.* 125, 55-68.
54. Lambert, M.R., Johnson, J.D., Lamka, K.G., Brierley, G.P. and Altschuld, R.A. (1986) Intracellular Free Ca^{2+} and the Hypercontracture of Adult Rat Heart Myocytes. *Archives Biochem. Biophys.* 245, 426-435.
55. Fiamingo, F.G., Altschuld, R.A., and Alben, J.O. (1986) "Alpha and Beta-Forms of Cytochrome c Oxidase Observed in Rat Heart Myocytes by Low Temperature Fourier Transform Infrared Spectroscopy", *J. Biol. Chem.* 261, 12976-12987.
56. Vander Heide, R.S., Altschuld, R.A., Lamka, K.G. and Ganote, C.E. (1986). Modification of caffeine-induced injury in Ca^{2+} -free perfused rat hearts: Relationship to the calcium paradox. *Am. J. Pathol.* 123, 351-364.
57. Garfinkel, L., Altschuld, R.A. and Garfinkel, D. (1986). Magnesium in cardiac energy metabolism. *J. Mol. Cell. Cardiol.* 18, 1003-1013.
58. Zager, R.A. and Altschuld, R.A. (1986) Body temperature: an important determinant of severity of ischemic renal injury. *Am. J. Physiol.* 251, F87-F93.
59. Brierley, G.P., Wenger, W.C., Altschuld, R.A. Heart myocytes as models of the cellular response to ischemia. *Advances in Experimental Medicine & Biology* 1986;194:303-314.

60. Altschuld, R.A., Wenger, W.C., Lamka, K.G., Kindig, O.R., Capen, C.C., Mizuhira, V., Vander Heide, R.S. and Brierley, G.P. (1985). Properties of digitonin-lysed adult rat heart cells. *J. Biol. Chem.* 260, 14325-14334.
61. Wenger, W.C., Murphy, M.P., Brierley, G.P. and Altschuld, R.A. (1985). Effects of ionic strength and sulfhydryl reagents on the binding of creatine phosphokinase to heart mitochondrial inner membranes. *J. Bioenergetics and Biomemb.* 17, 295-303.
62. Wenger, W.C., Murphy, M.P., Kindig, O.R., Capen, C.C., Brierley, G.P., and Altschuld, R.A. (1985) Mitochondrial enzyme retention by irreversibly damaged rectangular isolated adult rat heart myocytes. *Life Sci.* 37, 1697-1704.
63. Altschuld, R.A., Hohl, C.M., Lamka, K.G., and Brierley, G.P. (1984). Effects of Amiloride on Calcium Uptake by Myocytes Isolated from Adult Rat Hearts. *Life Sciences* 35, 865-870.
64. Unverferth, D.V., Altschuld, F.A. Lykens, M., Hunsaker, R.H., Vasko, J.S., Kakos, G.S., Leier, C.V., Magorien, R.D., and Kolibash, A.J. (1984) Reperfusion of the Human Myocardium by Saphenous Vein Bypass Grafts. *J. Thor. Cardiovas. Surg.* 87, 577-584.
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