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Curriculum Vitae
Richard T. Clements Ph.D.

Office Address: Cardiovascular Research Center
Rhode Island Hospital
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Place of Birth: Albany, NY

Education:

1996	B.S.	Union College, Schenectady, NY	Biology / Math
2002	M.S.	Albany Medical College, Albany, NY	Cardiovascular Science
2004	Ph.D.	Albany Medical College, Albany NY	Cardiovascular Science

Thesis: *Transforming Growth Factor-ß1 and pulmonary endothelial permeability: The role of RhoA/Rho-Kinase and p38-MAPK/HSP-25 regulation of Myosin Light Chain phosphorylation*. December, 2004.

Positions:

2005-2008	Postdoctoral Fellow, Cardiothoracic Surgery Research, Department of Surgery, Beth Israel Deaconess Medical Center and Harvard Medical School
2008-2009	Instructor: Cardiothoracic Surgery Research, Department of Surgery, Beth Israel Deaconess Medical Center and Harvard Medical School
2010-	Assistant Professor, Department of Surgery and Cardiovascular Research Center, Rhode Island Hospital and Alpert Medical School of Brown University

Professional Societies and Peer Review

2005-	American Heart Association
2009-	American Physiological Society
2008-	Microcirculatory Society
2006-	Ad-hoc Reviewer *Circulation*
2008-	Reviewer*: Journal of Thoracic and Cardiovascular Surgery*

Awards and Honors:

1992–1996	Chester Arthur Undergraduate Scholarship for Excellence, Union College
1998–2000	Appointed to NIH Predoctoral Fellowship in Cardiovascular Science, T32-HL-07194
2000–2004	Trustee's Scholarship for Research, Albany Medical College.
2001	Dean's Certificate and Award for Excellence in Research, Albany Medical College
2005 - 2008	Appointed to NIH Postdoctoral Training Grant in Cardiovascular Surgery Research, T32-HL-076130-01
2006	American Heart Association Travel Award: 3rd Annual Council on Basic Cardiovascular Science.
2006-2008	Bard Memorial Fellowship in Cardiothoracic Surgery Research.
2006	Excellence in Tutorial Facilitation, Academy Center for Teaching and Learning, Harvard Medical School.
2008	Recipient: American Heart Association Scientist Development Grant
2008	Recipient: NIH-Pathway to Independence Award K99/R00
2009	Excellence in Tutorial Facilitation, Academy Center for Teaching and Learning, Harvard Medical School.
2010	Recipient: NIH Loan Repayment Program

Teaching Activities

2005-2009	Harvard Medical School Molecular and Cellular Basis of Medicine and Disease Problem Based Learning Instructor
2006-2007	Harvard Medical School Introductions to the Profession Problem Based Learning Instructor
2000-2004	Albany Medical College Laboratory instructor for Pulmonary and Cardiovascular Physiology.

Funding Information

Ongoing research support:

2008-2013
Funding Source: National Institutes of Health, – Pathway to Independence Award 1K99HL093352-01
PI – Richard T. Clements Ph.D.
Title: Modulation of Small Heat Shock Proteins for treatment of surgically-induced myocardial stunning.
Score: 173 – 90,000/year - years 1 and 2, 249,000/year - years 3-5.

2010-2012
Funding Source: National Institutes of Health – Loan Repayment Program
Title: Small Heat Shock Proteins in Surgically-induced myocardial stunning.

Completed research support:

2008-2012
Funding Source: American Heart Association, Scientist Development Grant
P.I. - Richard T. Clements Ph.D.
Title "Modulation of small heat shock proteins for treatment of surgically-induced myocardial stunning"
Percentile: 1% - 77,000/year - 4 years
Relinquished 10/2008

2005-2008
Funding Source: NIH
P.I. – Frank W Sellke M.D.
Title –"Postdoctoral Training Grant in Cardiovascular Surgery Research, T32-HL-076130-01"

1998-2000
Funding Source: NIH
P.I. – Thomas Saba Ph.D.
Title - "Predoctoral Fellowship in Cardiovascular Science, T32-HL-07194"

Publications:

1. **Clements RT**, Feng, J., Bianchi C, and Sellke, FW.. p38-MAPK-dependent Small Heat Shock Protein 27 (HSP27) and αB-crystallin (cryAB) Phosphorylation in Regulation of Myocardial Function Following Cardioplegic Arrest,2011 *In press: American Journal of Physiology, Heart and Circulatory Physiology.*

2. Feng J, Chu LM, Robich MP, **Clements RT**, Khabbaz KR, Hagberg R, Liu Y, Osipov RM, Sellke FW. Effects of cardiopulmonary bypass on endothelin-1-induced contraction and signaling in human skeletal muscle microcirculation. Circulation. 2010 Sep 14;122(11 Suppl):S150-5.

3. Robich MP, Osipov RM, Nezafat R, Feng J, **Clements RT**, Bianchi C, Boodhwani M, Coady MA, Laham RJ, Sellke FW.Resveratrol improves myocardial perfusion in a swine model of hypercholesterolemia and chronic myocardial ischemia. Circulation. 2010 Sep 14;122(11 Suppl):S142-9.

4. Robich MP, Osipov RM, Chu LM, Feng J, Burgess TA, Oyamada S, **Clements RT**, Laham RJ, Sellke FW. Temporal and spatial changes in collateral formation and function during chronic myocardial ischemia. J Am Coll Surg. 2010 Oct;211(4):470-80

5. Feng J, Liu Y, Khabbaz KR, Hagberg R, Robich MP, **Clements RT**, Bianchi C, Sellke FW. Decreased contractile response to endothelin-1 of peripheral microvasculature from diabetic patients. Surgery. 2010 Aug 19

6. Mieno S, Boodhwani M, Robich MP, **Clements RT**, Sodha NR, Sellke FW. Effects of diabetes mellitus on VEGF-induced proliferation response in bone marrow derived endothelial progenitor cells. J Card Surg. 2010 Sep;25(5):618-25.

7. Oyamada S, Bianchi C, Takai S, Robich MP, **Clements RT**, Chu L, Sellke FW Impact of acute myocardial ischemia reperfusion on the tissue and blood-borne renin-angiotensin system. Surgery. 2010 Aug;148(2):453-62.

8. Osipov RM, Bianchi C, Feng J, **Clements RT**, Liu Y, Robich MP, Glazer HP, Sodha NR, Sellke FW. Effect of hypercholesterolemia on myocardial necrosis and apoptosis in the setting of ischemia-reperfusion. Circulation. 2009 Sep 15;120(11 Suppl):S22-30

9. Sodha NR, **Clements RT**, Feng J, Liu Y, Bianchi C, Horvath EM, Szabo C, Stahl GL, Sellke FW.Hydrogen sulfide therapy attenuates the inflammatory response in a porcine model of myocardial ischemia/reperfusion injury. J Thorac Cardiovasc Surg. 2009 Oct;138(4):977-84. Epub 2009 Jun 13.

10. Robich MP, Araujo EG, Feng J, Osipov RM, **Clements RT**, Bianchi C, Sellke FW. Altered coronary microvascular serotonin receptor expression after coronary artery bypass grafting with cardiopulmonary bypass. J Thorac Cardiovasc Surg. 2009 Jul 24.

11. Osipov RM, Robich MP, Feng J, Liu Y, **Clements RT**, Glazer HP, Sodha NR, Szabo C, Bianchi C, Sellke FW. Effect of Hydrogen Sulfide in a Porcine Model of Myocardial Ischemia-Reperfusion: Comparison of Different Administration Regimens and Characterization of the Cellular Mechanisms of Protection. J Cardiovasc Pharmacol. 2009 Jul 17.

12. Glazer HP, Osipov RM, **Clements RT**, Sellke FW, Bianchi C. Hypercholesterolemia is associated with hyperactive cardiac mTORC1 and mTORC2 signaling. Cell Cycle. 2009 Jun 1;8(11):1738-46. Epub 2009 Jun 3.

13. Osipov RM, Robich MP, Feng J, **Clements RT**, Liu Y, Glazer HP, Wagstaff J, Bianchi C, Sellke FW Effect of thrombin fragment (TP508) on myocardial ischemia-reperfusion injury in hypercholesterolemic pigs. J Appl Physiol. 2009 Jun;106(6):1993-2001. Epub 2009 Apr 16.

14. **Clements RT**, Sodha NR, Feng J, Boodhwani M, Liu YH, Mieno S, Khabbaz K, Bianchi C, Sellke FW. Impaired coronary vasodilation correlates with enhanced smooth muscle MLC phosphorylation in Diabetes. Microcirculation 2009;16:193-206.

15. Sodha NR, **Clements RT**, Boodhwani M, Xu SH, Laham RJ, Bianchi C, Sellke FW. Endostatin and angiostatin are increased in diabetic patients with coronary artery disease and associated with impaired coronary collateral formation. Am J Physiol Heart Circ Physiol. 2009 Feb;296(2):H428-34.

16. Osipov RM, Bianchi C, **Clements RT**, Feng J, Liu YH, Xu SH, Robich M, Wagstaff J, Sellke FW. Thrombin fragment (TP508) decreases myocardial infarction and apoptosis after ischemia reperfusion injury. Ann Thorac Surg 2009;87:786-9

17. **Clements RT**, Smejkal G, Sodha NR , Ivanov AR, Asara JM, Feng J, Lazarov A, Gautum S, Senthilnathan V, Khabbaz KR, Bianchi C, Sellke FW. Pilot proteomic profile of differentially regulated proteins in right atrial appendage before and after cardiac surgery using cardioplegia and cardiopulmonary bypass**.** Circulation. 2008; 118[Suppl I]:S24-S31

18. Feng J, Liu YH, **Clements RT**, Sodha NR, Khabbaz KR, Senthilnathan V, Nishimura KK, Alper SL, Sellke FW. Calcium-activated potassium channels contribute to human coronary microvascular dysfunction after cardioplegia arrest. Circulation 2008; 118 [Suppl I]: S46-S51

19. Liu Y, Sellke EW, Feng J, **Clements RT**, Sodha NR, Khabbaz KR, Senthilnathan V, Alper SL, Sellke FW. Calcium-activated potassium channels contribute to human skeletal muscle microvascular endothelial dysfunction related to cardiopulmonary bypass. Surgery. 2008 Aug;144(2):239-44.

20. Sodha NR, Boodhwani M, Ramlawi B, **Clements RT**, Mieno S, Feng J, Xu SH, Bianchi C, Sellke FW. Atorvastatin increases myocardial indices of oxidative stress in a porcine model of hypercholesterolemia and chronic ischemia. J Card Surg. 2008;23(4):312-20

21. Sodha NR, Boodhwani M, **Clements RT**, Xu SH, Khabbaz KR, Sellke FW. Increased antiangiogenic protein expression in the skeletal muscle of diabetic swine and patients. Arch Surg. 2008;143(5):463-70.

22. Mieno S, **Clements RT**, Boodhwani M, Sodha NR, Ramlawi B, Bianchi C, Sellke FW.Characteristics and Function of Cryopreserved Bone Marrow-Derived Endothelial Progenitor Cells. Annals of Thoracic Surgery 2008:85(4):1361-6.

23. Sodha NR, **Clements RT**, Feng J, Liu Y, Bianchi C, Horvath EM, Szabo C, Sellke FW.Neel R. The Effects of Therapeutic Sulfide on Myocardial Apoptosis in Response to Ischemia – Reperfusion Injury, Eur. J. Cardiothorac and Vasc Surgery 2008; 33 (5):906-13.

24. Boodhwani M, Mieno S, Feng J, Sodha NR, **Clements RT**, Xu SH, Sellke FW. Atorvastatin impairs the myocardial angiogenic response to chronic ischemia in normocholesterolemic swine. J Thorac Cardiovasc Surg. 2008;135(1):117-22

25. Sodha, NR, Boodhwani, M, Ramlawi, B, **Clements, RT**, Mieno, S, Feng, J, Xu, S, Bianchi, C, Sellke, FW. Atorvastatin Increases Myocardial Indices of Oxidative Stress in a Porcine Model of Hypercholesterolemia and Chronic Ischemia. J Card Surg. 2008;23(4):312-20

26. Khabbaz KR, Feng J, Boodhwani M, **Clements RT**, Bianchi C, Sellke FW. Nonischemic myocardial acidosis adversely affects microvascular and myocardial function and triggers apoptosis during cardioplegia. J Thorac Cardiovasc Surg. 2008;135(1):139-46

27. Boodhwani M, Sodha NR, Mieno S, Ramlawi B, Xu SH, Feng J, **Clements RT**, Ruel M, Sellke FW. Insulin treatment enhances the myocardial angiogenic response in diabetes.J Thorac Cardiovasc Surg. 2007;134(6):1453-60

28. **Clements RT**, Sodha NR, Feng J, Mieno S, Boodhwani M, Ramlawi B, Bianchi C, Sellke FW. Phosphorylation and translocation of heat shock protein 27 and alphaB-crystallin in human myocardium after cardioplegia and cardiopulmonary bypass.J Thorac Cardiovasc Surg. 2007;134(6):1461-70.

29. Sodha NR, **Clements RT**, Bianchi C, Sellke, FW. Cardiopulmonary Bypass with Cardioplegic Arrest Activates Protein Kinase C in the Human Myocardium. Journal of the American College of Surgeons. *J Am Coll Surg* 2008; 206(1);33-41.

30. Ramlawi B, Otu H, Mieno S, Boodhwani M, Sodha NR, **Clements RT**, Bianchi C, Sellke FW. Oxidative stress and atrial fibrillation after cardiac surgery: a case-control study. Ann Thorac Surg. 2007;84(4):1166-72.

31. Boodhwani M, Sodha NR, Mieno S, Xu SH, Feng J, Ramlawi B, **Clements RT**, Sellke FW. Functional, cellular, and molecular characterization of the angiogenic response to chronic myocardial ischemia in diabetes. Circulation. 2007 11;116(11 Suppl):I31-7

32. Sodha NR, Boodhwani M, **Clements RT**, Feng J, Xu SH, Sellke FW. Coronary microvascular dysfunction in the setting of chronic ischemia is independent of arginase activity. Microvasc Res. 2008 r;75(2):238-46.

33. Sodha NR, Feng J, **Clements RT**, Bianchi C, Boodhwani M, Ramlawi B, Mieno S, Khabbaz KR, Sellke FW.Protein kinase C alpha modulates microvascular reactivity in the human coronary and skeletal microcirculation. Surgery. 2007;142(2):243-52

34. Mieno S, Boodhwani M, **Clements RT.**, Ramlawi B, Sodha NR, Li J, Sellke FW. Aging is associated with an impaired coronary microvascular response to vascular endothelial growth factor in patients. J Thorac Cardiovasc Surg. 2006;132(6):1348-55

35. Feng J, Sellke ME, Ramlawi B, Boodhwani M, **Clements R**, Li J, Bianchi C, Sellke FW. Bradykinin induces microvascular preconditioning through the opening of calcium-activated potassium channels. Surgery. 2006;140(2):192-7.

36. Ramlawi B, Feng J, Mieno S, Szabo C, Zsengeller Z, **Clements R**, Sodha N, Boodhwani M, Bianchi C, Sellke FW. Indices of apoptosis activation after blood cardioplegia and cardiopulmonary bypass. Circulation. 2006 l 4;114(1 Suppl):I257-63.

37. Mieno S, Ramlawi B, Boodhwani M, **Clements RT**, Minamimura K, Maki T, Xu SH, Bianchi C, Li J, Sellke FW. Role of stromal-derived factor-1alpha in the induction of circulating CD34+CXCR4+ progenitor cells after cardiac surgery. Circulation. 2006 4;114(1 Suppl):I186-92.

38. Boodhwani M, Feng J, Mieno S, Ramlawi B, Sodha N, **Clements R**, Sellke FW. Effects of purified poloxamer 407 gel on vascular occlusion and the coronary endothelium. Eur J Cardiothorac Surg. 2006;29(5):736-41

39. **Clements, R.T.**, Singer, H.A., Keller, R.S., Minnear, F.L., Vincent, P.A. RhoA and Rho-kinase dependent and independent signals mediate TGFß-induced pulmonary endothelial cytoskeletal reorganization and permeability. Am J Physiol Lung Cell Mol Physiol, 2005 Feb;288(2):L294-306.

40. Goldberg, P.L., MacNaughton, D.E., **Clements, R.T.**, Minnear, F.L., Vincent, P.A.. P38 MAPK activation by TGF-ß1 increases MLC phosphorylation and endothelial monolayer permeability. Am J Physiol Lung Cell Mol Physiol, 282: L146-154, 2002.

41. Gertzberg, N., **Clements R.T.**, Jaspers, I., Ferro, T.J., Neumann, P.H., Flescher, E., Johnson, A.: Tumor Necrosis Factor-α induced Activating Protein-1 activity is modulated by nitric-oxide mediated Protein Kinase G activation. Am. J. Respir Cell Mol Biol 22:105-115, 2000.

42. Ferro, T.J., **Clements R.T.**, Neumann, P.H., Gertzberg, N., Johnson, A.: Protein kinase C-α mediates endothelial barrier dysfunction induced by TNF-α. Am J Physiol 278:L1107-L1117, 2000.

Reviews:

Neel R. Sodha, **Richard T. Clements**, and Frank W. Sellke Vascular Changes After Cardioplegic Arrest And Cardiopulmonary Bypass: The Roles Of Nitric Oxide Synthase, Cyclooxygenase, Kinase Pathways, And Growth Factors. Frontiers in Bioscience. In press.

Presentations:

The Effects of Therapeutic Sulfide on Myocardial Apoptosis in Response to Ischemia – Reperfusion Injury, European Association of Cardiothoracic Surgeons. Geneva, Switzerland. September 2007 (Oral Abstract)

Cardioplegia and Cardiopulmonary Bypass induce phosphorylation and myofilament localization of HSP27 and aB-crystallin in human myocardium. American Heart Association, Scientific Sessions: Myocardial protection and intraoperative management. Chicago, Ill. November 13, 2006. (Oral Abstract)

Ischemic insults modulate small HSP phosphorylation and localization in human myocardium Boston Biomedical Research Institute, March 10, 2006.

Cardioplegia and Cardiopulmonary Bypass induce phosphorylation and translocation of HSP27 and aB-crystallin in human myocardium. Beth Israel Deaconess Medical Center, Invited Talk: Center for Vascular Biology Research Annual Retreat, January 27, 2006.

Nitric Oxide mediated activation of pulmonary endothelial PKG increases mRNA of PKCα in response to TNFα.. Lung Oxidant Stress and Gene Expression. Experimental Biology, San Francisco. 1998. (Oral Abstract)

Special Sessions oral presentation: Highlights in Graduate Student Research in Respiratory Pathology, American Society for Investigative Pathology. Experimental Biology, San Francisco. 1998 (Oral Abstract)

ABSTRACTS (First Author)

Clements, R.T., Minnear F.L., Goldberg, P.L., MacNaughton, D.E., Singer, H.A., Vincent, P.A.: TGFß increases myosin light chain serine 19 and threonine 18 phosphorylation in pulmonary artery endothelial cells. Molec. Biol. Cell. (suppl) 11:471a, 2001. San Francisco, CA.

Clements, R.T., Minnear, F.L., and Vincent, P.A.: TGFß-induced pulmonary endothelial MLC phosphorylation, stress fiber formation, and permeability require RhoA and Rho Kinase. FASEB J. 17,5: 161.6, 2003. April 2003, San Diego, CA.

Richard T. Clements, Jun Feng, Neel R Sodha, Shigetoshi Mieno, Basel Ramlawi, Munir Boodhwani, Cesario Bianchi, and Frank W. Sellke. Cardioplegia and Cardiopulmonary Bypass Induces Phosphorylation and Myofilament localization of Heat Shock Protein 27 and alphaB-crystallin in human myocardium. American Heart Association, Myocardial Protection, Scientific Sessions, Orlando Florida, 2006.

Clements RT, Neel R. Sodha, Jun Feng, Munir Boodhwani, Sirisha Emani, Cesario Bianchi, and Frank W. Sellke. Diabetic Impairment of NO-dependent coronary smooth muscle relaxation correlates with enhanced contractile signaling and is normalized by insulin. FASEB, Experimental Biology, Washington D.C. 2007.

Richard T. Clements, Neel Sodha, Jun Feng, Sirisha Emani, V Senthilnathan, Kamal Khabbaz, Cesario Bianchi, and Frank W. Sellke. Proteomic Profile of Differentially regulated Proteins in human myocardium before and after cardioplegia and cardiopulmonary bypass. American Heart Association, Scientific Sessions, Myocardial Protection, Chicago Illinois, November 2007

Richard T. Clements, Jun Feng, Cesario Bianchi, and Frank W. Sellke. Role of p38-MAPK-and Small Heat Shock Protein 27 (HSP27) Phosphorylation in Regulation of Myocardial Function Following Cardioplegic Arrest. American Heart Association, Myocardial Protection and Intraoperative Management, November 2009, Orlando Fl.

Richard T. Clements, Alexander R. Ivanov, Gary .S. Smejkal, Cesario Bianchi, and Frank W. Sellke. Phosphoproteomic profile of differentially phosphorylated proteins in human myocardium before and after cardiac surgery utilizing cardioplegia and cardiopulmonary bypass. FASEB 2010.

Clements RT, Cordeiro, B. Feng J., Bianchi C., Sellke, F. Inhibition of PKC-delta increases cardiac contractile performance and coronary perfusion following cold cardioplegic arrest in isolated hearts, AHA 2010, Chicago, Ill.