Anne A. Knowlton, M.D.

Clinical Interests

Dr. Anne A. Knowlton specializes in cardiology, with particular interests in atrial fibrillation and heart failure. She graduated from Harvard University magna cum laude with a degree in biology. After earning her medical degree from Yale University and doing her internship and residency training at Boston City Hospital, Dr. Knowlton completed a cardiology fellowship at Boston University Medical Center. She was honored with a National Research Award as a postdoctoral fellow at the Cardiovascular Institute at Boston University School of Medicine from 1984 to 1986.

Research/Academic Interests

Dr. Knowlton has research interests in heat shock protein, apoptosis, heart failure, estrogen and aging. She has written numerous papers and several book chapters on topics related to cardiovascular medicine and serves on the editorial board of the Journal of Heart Disease and Open Autoimmunity.

Synopsis: The research in our laboratory focuses in 4 areas related to the protective properties of heat shock proteins (HSPs), and a developing area of research on aging, estrogen and mechanisms of cardiovascular disease. These four areas of research are:

1) Mechanisms underlying the protective properties of HSP72 in the cell, with particular focus of localization of HSP72 to the nucleus with stress.

2) Role of HSP60 in apoptosis and heart failure; we are interested in whether HSPs in heart failure paradoxically have a detrimental effect on the heart mediated by the immune system and an inflammatory response.

3) Estrogen and the HSPs - regulation of expression of HSPs by estrogen in cardiac myocytes and endothelial cells.

4) Estrogen, aging and the cardiovascular system.

We are interested in the interaction of aging and estrogen loss on the expression of HSP72 in the heart, and what impact this has on the response to ischemia. We use simulated ischemia of isolated cardiac myocytes, endothelial cell culture and failing hearts as models in our work. We are particularly interested in protein localization and post-translational modification, and the effect of disease on this.

In studying particular aspects of HSP function we use various molecular methods including yeast-2-hybrid, site-directed mutagenesis and overexpression systems to study the effects of these changes. Our overall goal is to better understand cardiovascular injury in order to develop better treatments.

Title

Professor

Staff Cardiologist at VA Medical Center

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Education	M.D., Yale University, New Haven CT 1979 Cell Biology, Yale University, New Haven CT 1974-1977 A.B., Harvard University, Boston MA 1974
Internships	Internal Medicine, Boston City Hospital, Boston MA 1979-1980
Residency	Internal Medicine, Boston City Hospital, Boston MA 1980-1982
Fellowships	Cardiology, Boston University Medical Center, Boston MA 1982-1984
Board Certifications	American Board of Internal Medicine, 1984 American Board of Internal Medicine, Cardiology, 1987
Professional Memberships	American College of Cardiology American Heart Association American Physiological Society Council on Basic Science International Society for Heart Research
Honors and Awards	Albrecht Fleckenstein Memorial Award for Distinguished Contribution to Basic Research, International, 2013 Vice Chancellor's Faculty Award for Excellence and Achievement, University of California, Davis, 2007

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Anne A. Knowlton, M.D.

Patient Service Award, VA Medical Center, 2000

Select Recent Publications

To view a detailed list of Dr. Knowlton's publications, please click here.

Chen L, Liu T, Tran A, Lu X, Tomilov AA, Davies V, Cortopassi G, Chiamvimonvat N, Bers DM, Votruba M, Knowlton AA. OPA1 mutation and late-onset cardiomyopathy: mitochondrial dysfunction and mtDNA instability. J Am Heart Assoc. 2012 Oct;1(5):e003012.

Stice, J.P., L. Chen, S.C. Kim, J.S. Jung, A. L. Tran, T. T. Liu and A.A. Knowlton. 17?-Estradiol, Aging, Inflammation and the Stress Response in the Female Heart. Endocrinology, 2011;152:1589-98

A.S. Pechenino, L. Lin, F. N. Mbai, A. R. Lee, X. M. He, J. N. Stallone and A. A. Knowlton. Impact of Aging vs. Estrogen Loss on Cardiac Gene Expression: Late Estrogen Replacement and Inflammation. Physiologic Genomics, 2011; 43:1065-1073

Wang, Y., L. Chen, N. Hagiwara, and A. A. Knowlton. Regulation of Heat Shock Protein (HSP) 60 and 72 Expression in the Failing Heart. J. Mol. Cell. Cardiol. 2010;48:360-366

Kim SC, Stice JP, Chen L, Jung JS, Gupta S, Wang Y, Baumgarten G, Trial J, Knowlton AA. Extracellular heat shock protein 60, cardiac myocytes, and apoptosis. Circ Res. 2009 Dec 4;105 (12):1186-95.

Chen L, Gong Q, Stice JP, Knowlton AA. Mitochondrial OPA1, apoptosis, and heart failure. Cardiovasc Res. 2009 Oct 1;84(1):91-9.

Lin L, Kim SC, Wang Y, Gupta S, Davis B, Simon SI, Torre-Amione G, Knowlton AA. HSP60 in heart failure: abnormal distribution and role in cardiac myocyte apoptosis. Am J Physiol Heart Circ Physiol. 2007 Oct;293(4):H2238-47.

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Knowlton AA, Kapadia S, Torre-Amione G, Durand JB, Bies R, Young J, Mann DL. Differential expression of heat shock proteins in normal and failing human hearts. J Mol Cell Cardiol. 1998 Apr;30(4):811-8.

Knowlton AA, Brecher P, Apstein CS. Rapid expression of heat shock protein in the rabbit after brief cardiac ischemia. J Clin Invest. 1991 Jan;87(1):139-47.

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