

CARDIOTHORACIC SURGERY

OVERVIEW

For the sixth year in a row, the report from the massive national database of the Society of Thoracic Surgeons provided vivid objective confirmation of the quality of the clinical cardiac surgery performed at Yale. The report to our Center for Outcomes Research found Yale's survival statistics for coronary artery bypass, mitral valve replacement, and aortic valve replacement to exceed by a wide margin the predicted rates based on clinical characteristics of the population. Yale placed the first revolutionary Jarvik 2000® artificial heart device in New England.

The Yale Center for Thoracic Aortic Diseases continued its exponential growth and now includes computerized data on 2,000 patients, 4,000 imaging studies, and 4,000 patient-years of follow-up. Referrals include national and international patients. Clinical research from this database continues to be presented worldwide and is felt to represent the most extensive and rigorous information available on the natural behavior of the thoracic aorta. Work begun under an American Heart Association grant is being extended to elucidate the genetics of transmission of thoracic aortic aneurysm, which Yale research has shown to be an inherited disorder. Dr. Eleftheriades was awarded funds to establish the Jo and Gus Berkes Research Fellow Fund for laboratory investigation.

Dr. Barrett, as Medical Director of CTICU, has introduced an early vent-weaning protocol and is currently working on an atrial fibrillation protocol. **Dr. Coady** continues his research on the natural history and genetics of thoracic aortic disease that he began as a surgical resident at Yale. **Dr. Eleftheriades'** novel "heart-and-a-half" cardiac transplant procedure is aimed at preventing death from right heart failure of the donor heart due to antecedent pulmonary hypertension in the recipient. On-going pre-clinical experiments continue in the laboratory. Recent modifications of this technique aim at novel solutions for congenital cardiac lesions. **Dr. Hammond** continues to perform xenograft transplantation research. Suppressor genes from trophoblast libraries that repress MHC Class I and Class II expression are being cloned. The cloned genes are transfected into MHC expressing cells and their effect on MHC expression analyzed at the mRNA and protein level. The mechanism for constitutive and inducible suppression of Class II antigen by CIITA promoter binding inhibition is also being investigated. **Dr. Kopf** is performing clinical application of radiofrequency ablation for MAZE procedure for congenital heart surgery. In collaboration with Pediatric Cardiology and Adult Cardiology and Imaging, he has developed a Yale internet-based instructional program in congenital heart disease. Dr. Tellides continues his well-funded basic science research in vascular biology and transplantation immunology.

FACULTY

	<i>Academic Rank</i>	<i>Academic Interests</i>
John A. Eleftheriades, M.D.	Professor	Diseases of the aorta; diaphragm pacing; novel right ventricle-sparing heart transplantation
Peter W. Barrett, M.D., M.S.	Assistant Professor	Lung cancer
Michael A. Coady, M.D., M.P.H.	Assistant Professor	Cardiac transplantation; aortic aneurysm
Graeme L. Hammond, M.D.	Professor	Xenograft transplantation
Gary S. Kopf, M.D.	Professor	Congenital heart disease; pulmonary artery shunting; tetralogy of Fallot; coarctation of the aorta
George Tellides, M.D., Ph.D.	Associate Professor	Transplantation immunology

STAFF

	<i>Position</i>
Meredith Blodget, PA-C	Physician Assistant
Gail Eddy, R.N.	Cardiac Transplantation Coordinator
Suzanne Giannotti	Assistant Administrator
Tim Hansen, PA-C	Physician Assistant
Dominic Mariconda, PA-C	Physician Assistant
Michael Marranta, PA-C	Physician Assistant
Marianne McCarthy	Academic Coordinator
Lisa Rinaldi, PA-C	Physician Assistant
Maryann Tranquilli, R.N.	Cardiothoracic Surgical Coordinator

POST-DOCTORAL FELLOWS, RESEARCH ASSOCIATES AND TRAINEES

	<i>Position</i>	<i>Institution of Last Degree</i>
Gonzalo Albornoz, M.D.	Postdoctoral fellow	University of San Carlos
Yalai Bai, MD, Ph.D.	Associate research scientist	West China University Peking Medical College
Zhong Ding, M.D.	Postdoctoral fellow	Xinxiang Medical College
Ioannis Hatzaras, M.D.	Postdoctoral fellow	Aristotle University of Thessaloniki
Alexandre Iakimov, M.D.	Postdoctoral fellow	Russian State Medical University
Hooman R. Jahromi, M.D.	Postdoctoral fellow	Tehran Medical University
Jinah Kim, M.D.	Postdoctoral fellow	Mt. Sinai School of Medicine
Raymond Lynch	5 th year Medical Student	Yale School of Medicine
Remo Moomiaie, M.D.	Postdoctoral fellow	University of Szeged Medical School
Yinong Wang, M.D., Ph.D.	Associate research scientist	Beijing Medical University

CURRENT GRANT SUPPORT

	<i>Title</i>	<i>Funding Agency</i>	<i>Dates</i>
George Tellides, M.D., Ph.D. (J. Pober, M.D., Ph.D., P.I.)	Chronic DTH and IFN- γ in human graft arteriosclerosis	National Heart, Lung, and Blood Institute (NIH)	2001 - 2006
George Tellides, M.D., Ph.D. (A. Bothwell, Ph.D., P.I.)	Human anti-porcine immune responses in vivo	National Heart, Lung, and Blood Institute (NIH)	2000 - 2004
George Tellides, M.D., Ph.D. (J. Pober, M.D., Ph.D., J. Bradley, B.Med.Sci., B.M., B.S., D.M., P.I.)	Regulation of Vascular Smooth Muscle Cell Apoptosis and Transparent Vasculopathy	Medical Research Council of the United Kingdom; Cambridge-Yale Cardiovascular Program Planning Grant	2000 - 2004
George Tellides, M.D., Ph.D. (J. Pober, M.D., Ph.D., P.I.)	Functions of STAT Proteins in Vascular Cell Pathology	ISIS Pharmaceuticals Collaborative Research Agreement	2002 - 2004
John Eleftheriades, M.D.	Genetics of Thoracic Aortic Aneurysms	Celera Diagnostics	2003 - present
	Aprotinin in Thoracic Aortic Surgery Patients	Bayer Corporation	2003 - present
	Right Ventricle-sparing Heart Transplantation	Synectic Engineering	2002 - 2004

John Eleftheriades, M.D. (cont'd)	Right Ventricle-sparing Heart Transplantation	Ferraiolo Foundation Award	2002-present
Jinah Kim, M.D. Mentor: George Tellides, M.D., Ph.D.	Role of Chemokine Signaling in Graft Arteriosclerosis	Society of University Surgeons	2003 - 2004
Jinah Kim, M.D. Mentor: George Tellides, M.D., Ph.D.	Characterization of the Role of Chemokine Signaling in Cardiac Graft Arteriosclerosis	OHSE Award/ Yale University	2003 - 2004
Raymond Lynch Mentor: Graeme Hammond, M.D.	Mechanism of MHC Class I Suppression of the Trophoblast	OHSE Award/ Yale University	2003 - 2004

HONORS AND AWARDS

John Eleftheriades, M.D.	Walter Bleifield Memorial Award for Distinguished Contribution in Clinical Research in Cardiology from the International Academy of Cardiology, 2003
	John B. Chang Research Award from the International College of Angiology, 2004
	"America's Top Doctors 2004", "New York Metro Area's Best Doctors 2003, 2004" published by Castle Connolly
	<i>Good Housekeeping</i> Magazine named Yale New Haven Hospital's Heart Center the 44 th best in the nation for women, Feb. 2004
	Selected as one of nation's 10 best doctors by <i>Men's Health</i> Magazine; given position on editorial board
	<i>Wall Street Journal</i> reporter Kevin Helliker is awarded 2004 Pulitzer Prize for series on aneurysms. Dr. Eleftheriades is listed as main source of information in the articles
Gary Kopf, M.D.	"New York Metro Area's Best Doctors 2003, 2004" published by Castle Connolly

MAJOR INVITED LECTURES

John Eleftheriades, M.D.	"Mechanical properties of the aorta in normal and aneurysmal states" 3 rd World Congress on Heart Disease: New Trends in Research, Diagnosis and Treatment. Washington, DC, July 12-15, 2003.
	"Surgical initiatives for heart failure." American Heart Association Scientific Sessions, Cardiovascular Seminars in Clinical Science. Orlando, FL, November 10, 2003.
John Eleftheriades, M.D. (cont'd)	"When surgery has to be advised?" & "Alternative surgical approaches for left ventricle assist devices implantation." Instituto Clinico Humanitas' 4 th International Symposium: From Risk Factors to Heart Failure. Milan, Italy,

November 14, 2003.

“The aortic valve and its aortic ‘home.’” 4th Annual Current Concepts in Cardiovascular Management. Buffalo, New York, November 21, 2003.

“New modalities in the management of heart failure treatment.” Mid-Atlantic Chapter of the American Society of Hypertension's Managing the Hypertension to Heart Failure Continuum. Washington, DC, December 6, 2003.

“Aorta and its aortic ‘home.’” Current Management of Valvular Heart Disease: A Practical Approach, University of Connecticut School of Medicine, Farmington, CT, March 24, 2004.

“Natural History” in Descending and Thoracoabdominal Aorta Session. Aortic Surgery Symposium IX, New York, NY, April 22-23, 2004.

“Examining Outcomes in Cardiothoracic Surgery” in Serine Proteases in Cardiothoracic Surgery: From Mechanisms to Outcomes. American Association of Thoracic Surgery 84th Annual Meeting, Toronto, ON, April 24, 2004.

“Thoracic Aortic Aneurysm: Reading the Enemy’s Playbook” 32nd Meeting of the Japanese Vascular Society, Tokyo, Japan, May 14, 2004.

“Recent Advances in Imaging Technology for Vascular Disorders: The Thoracic Aorta.” 19th Annual Scientific Meeting and Exposition, The American Society of Hypertension, New York, NY, May 20, 2004.

“Thoracic Aortic Aneurysm: Reading the Enemy's Playbook.” Current Trends in Cardiac Surgery Conference of the AHEPA General Hospital, Thessaloniki, Greece, June 18-19, 2004.

John B. Chang Award Lecture: “Thoracic Aortic Aneurysm: Reading The Enemy's Playbook.” 46th World Congress of the International College of Angiology. Lexington, KY, July 12, 2004.

George Tellides, M.D., Ph.D.

“The Pathology of Vascular Remodeling”, Novartis Satellite Symposium, Annual Meeting of the Canadian Society of Transplantation, Mont Tremblant, Canada, 2004.

“Vascular Remodeling”, State-of-the-art Symposium, XX International Congress of the Transplantation Society, Vienna, Austria, 2004.

MAJOR YALE LECTURES

Michael Coady, M.D., M.P.H.

"Bridge to Cardiac Transplantation" Surgery Grand Rounds, Yale University School of Medicine, September 2003

John Eleftheriades, M.D.

"Thoracic Aortic Aneurysm: Reading the Enemy's Playbook" Surgery Grand Rounds, Yale University School of Medicine, February 25, 2004

Gary Kopf, M.D.

"Cardiac Surgery in the Newborn", Third Annual Cardiac Surgical PA

- Gary Kopf, M.D. (cont'd) Symposium. Mohegan Sun Resort, Connecticut, 2003.
- George Tellides, M.D., Ph.D. “Surgical Revascularization of the Failing Heart”, Surgery Grand Rounds, Yale University School of Medicine, 2003
- “Inducers and Markers of Type I Cytokine-Producing Immune Responses in Coronary Atherosclerosis”, 3rd Annual Joint Retreat of the Interdepartmental Program in Vascular Biology and Transplantation and the Interdisciplinary Program in Clinical Transplantation, Yale University School of Medicine, 2004

ORIGINAL PUBLICATIONS

ORIGINAL ARTICLES

Albornoz GF, Tang PC, **Coady MA**, Davies RR, Roberts M, Rizzo JA, **Kopf GS**, **Elefteriades JA**: Are Thoracic Aortic Aneurysms a Genetic Disease? *J Am Coll Cardiol* 41(6): 287, 2003.

Coady MA, Mitchell RS. Femoro-femoral partial bypass in the treatment of thoracoabdominal aneurysms. *Semin Thorac Cardiovasc Surg*. 15(4): 340-4, 2003.

Elefteriades JA. Mechanical Properties of Normal and Aneurysmal Ascending Aorta. *J Heart Dis* 3(1): 36-7, 2003.

Elefteriades, JA, Lovoulos C, Edwards R, Tittle S, Riley T, Tang PY, Rocco E, **Kopf G**. Novel Technique for Isolated Accessory Right Heart Transplantation for Congenital Heart Disease. *J Thorac Cardiovasc Surg* 125(6) 1283-1290, 2003.

Geirsson A, Lynch RJ, Paliwal I, Bothwell AL and **Hammond GL**. Human trophoblast noncoding RNA suppresses CIITA promoter III activity in Murine B-lymphocytes. *Biochem Biophys Res Com* 307:718-24, 2003.

Geirsson A, Paliwal I, Lynch RJ, Bothwell AL and **Hammond GL**. Class II transactivator promoter activity is suppressed through regulation by a trophoblast noncoding RNA. *Transplantat* 76(1), 2003.

Kopf GS, Mello DM. Surgery for congenital heart disease in low-birth weight neonates: a comprehensive statewide Connecticut program to improve outcomes. *Conn Med* 67(6): 327-32, 2003.

Koullias G, Modak RK, Korkolis D, Barash P, **Elefteriades JA**. Mechanical and elastic properties of the normal and aneurysmal ascending aorta by intraoperative epi-aortic echocardiography. *J Am Coll Cardiol* 41:6 (Supple II): 513a, 2003.

Koullias GJ, Korkolis DP, Hatzaras IS, **Elefteriades JA**, Jain D. Immunohistochemical testing for *Helicobacter Pylori* Infection in ascending aortic aneurysms and penetrating aortic ulcers. *Am J Cardiol* 93(1): 122-3, 2004.

Koullias GJ, Ravichandran P, Korkolis DP, Rimm DL, **Elefteriades JA**. Increased tissue microarray MMP expression favors proteolysis in thoracic aortic aneurysms and dissections. *Ann Thorac Surg* 78(6): 2106-10, 2004.

Lovoulos C, Tittle S, Goldstein L, Austin DJ, Singh S, Rocco E, Keane J, Tang P, **Kopf GS**, **Elefteriades JA**. Right ventricle-sparing heart transplantation effective against iatrogenic pulmonary hypertension. *J Heart Lung Transplant* 23(2): 236-41, 2004.

- Moinuddeen K, **Eleftheriades JA**. Standard CABG is the procedure of choice for myocardial Revascularization: pro point of view. *J Cardiothorac Vasc Anesth* 17(2): 260-2, 2003.
- Moltedo JM, **Kopf G**, Mello DM, Porter GA Jr. Right coronary artery arising from the left ventricular outflow tract: a rare congenital anomaly of the coronary arteries. *Pedi Cardiol* 24(6): 598-600, 2003.
- Pelletier MP, **Coady MA**, Macha M, Oyer PE, Robbins RC. Coronary atherosclerosis in cardiac transplant patients treated with total lymphoid irradiation. *J Heart Lung Transplant* 22(2): 124-9, 2003.
- Pike NA, Vricella LA, Ford RL, **Coady MA**, Coll AC, Black MD. Diffuse ST segment elevation: a common feature following minimally invasive SAD closure. *Heart Surg Forum* 6 Suppl 1: S37, 2003.
- Sedrakyan A, Gondek K, Paltiel AD, **Eleftheriades JA**. Volume expansion with albumin decreases mortality after coronary artery bypass graft surgery. *Chest* 123:1853-7, 2003.
- Sedrakyan A, Vaccarino V, Paltiel AD, **Eleftheriades JA**, Mattera JA, Roumanis SA, Lin Z, Krumholz HM. Age does not limit quality of life improvement in cardiac valve surgery. *J Am Coll Cardiol* 42(7): 1208-14, 2003.
- Vricella LA, **Coady MA**, Black MD. Initial experience with stentless porcine bioprosthesis for right ventricular outflow tract reconstruction in children. *J Thorac Cardiovasc Surg* 125(3): 17-27, 2003.
- Dai Z, Li Q, Wang Y, Gao G, Diggs LS, **Tellides G**, Lakkis FG. CD4(+)CD25(+) regulatory T cells suppress allograft rejection mediated by memory CD8(+) T cells via a CD30-dependent mechanism. *J Clin Invest* 113(2): 310-317, 2004.
- Koh KP, Wang Y, Yi T, Scotland RS, Lorber MI, Sessa WC, **Tellides G**, Pober JS. Allogeneic T cell-mediated endothelial dysfunction of human arteries transplanted in human peripheral blood lymphocyte reconstituted-immunodeficient mouse hosts depends on interferon-gamma. *Circulation* 108(17): 162 Suppl. IV, 2003.
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- Li Q, Wang Y, Yi T, Chalasani G, Dai Z, Lorber MI, **Tellides G**, Lakkis FG. Technique for retransplanting heterotopic heart grafts in mice. *Microsurgery* 24(6): 465-467, 2004.
- Min W, **Tellides G**. Adventitial ex vivo gene transfer with autologous vascular smooth muscle cells: a superior approach for delivery of therapeutics into the arterial wall? *J Mol Cell Cardiol* 36(3): 319-322, 2004.
- Pober JS, Bothwell AL, Lorber MI, McNiff JM, Schechner JS, **Tellides G**. Immunopathology of human T cell responses to skin, artery and endothelial cell grafts in the human peripheral blood lymphocyte/severe combined immunodeficient mouse. *Springer Semin Immunopathol* 25(2): 167-180, 2003.
- Rothermel AL, Wang Y, Schechner J, Mook-Kanamori B, Aird WC, Pober JS, **Tellides G**, Johnson DR. Endothelial cells present antigens in vivo. *BMC Immunology* 5(1): 5, 2004.
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Wang Y, Burns W, Tang P, Bai Y, Yi T, Schechner JS, Lorber MI, Pober JS, **Tellides G**. Gamma-interferon-dependent T cell-mediated injury and remodeling of human coronary arteries. *J Heart Lung Transplant* 22(1S): S154-5, 2003

Wang Y, Burns WR, Tang PCY, Yi T, Schechner JS, Zerwes HG, Sessa WC, Lorber MI, Pober JS, **Tellides G**. Interferon-g plays a non-redundant role in mediating T cell-dependent outward vascular remodeling of allogeneic human coronary arteries. *FASEB J* 18(3): 606-608, 2004.

REVIEWS AND CHAPTERS

Elefteriades JA. Treatment of Descending Aortic Dissection. In: Liotta D, Cooley D, et al (ed). *A Practical Textbook of Congenital and Acquired Diseases of the Aorta*. FD Liotta Foundation, Miami, FL, 2003.

Davies RR, Coady MA, **Elefteriades JA**. Pathologic Variants of Thoracic Aortic Dissections: Penetrating Atherosclerotic Ulcers and Intramural Hematomas. In: Liotta D, Cooley D, et al (ed). *A Practical Textbook of Congenital and Acquired Diseases of the Aorta*. FD Liotta Foundation, Miami, FL, 2003.

Koullias GJ, **Elefteriades JA**. Neurological Complications in Cardiac Surgery. In: Little AG, Murray KD (eds). *Complications of Cardiothoracic Surgery: Prevention and Treatment* Blackwell Publishing, Elmsford, NY, 405-435, 2004.

Tang PC, **Elefteriades JA**. Aortic Dissection. In: Yang SC and Cameron DE (eds.) *Current Therapy in Thoracic and Cardiovascular Surgery*. Harcourt Health Sciences, Philadelphia, PA, 574-578, 2004.

Elefteriades JA, Quin, JA. Phrenic Nerve Pacing. Chapter 56 In: Pearson FG, Cooper JD, Deslauriers J, Ginsburg RJ, Hiebert CA, Patterson GA, Urschel, HC (Eds). *Thoracic Surgery*, 2nd Edition, Churchill Livingstone, 2002.

EDITORIALS

Tittle SL, **Kopf GS, Elefteriades JA**. Letter to the Editor. Management of Aortic Intramural Hematoma. *J Am Coll Cardiol* 30(1), 2002.

Elefteriades JA, Hatzaras I, Tranquilli M, Elefteriades AJ, Stout R, Shaw RK, Silverman D, Barash P. Weight lifting and rupture of silent aortic aneurysms [Research Letter]. *JAMA* 290(22): 2803, 2003.

Elefteriades JA, Kopf G. Response to Letter to the Editor. Heterotopic right heart transplantation. *J Thorac Cardiovasc Surg* 127(2): 607-8, 2004.