



## John E. Hambor, PhD Cell Therapy Group

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### PROFILE

Greater than 16 years of drug discovery and stem cell technology experience; Strong scientific background; Demonstrated thought leader, media presence & executive management abilities

### EXPERIENCE

- 2009-Present **Cell Therapy Group - Director, Stem Cell-Based Drug Discovery** Vancouver, BC
- Independent consultant in the regenerative medicine industry with an emphasis on applications of stem cell models in drug discovery and the development of new technologies and tools
- 2008-2009 **CellDesign, Inc. - Chief Executive Officer** New Haven, CT
- As founder, played a key entrepreneurial role in the development and leadership of the company
  - Developed and commercialized stem cell-based products for use in drug screening applications
  - Negotiated and executed distribution agreements for stem cell tool products
  - Identified a novel mesenchymal stem cell in umbilical cord matrix for brown adipocytes
  - Formulated and implemented licensing and alliance strategies with major pharmaceutical firms
  - Awarded an Innovation Grant from Bristol-Myers Squibb to develop stem cell-derived hepatocytes
  - Established collaboration with Rutgers and BMS to develop neural stem cell-based synapse model
  - Prepared and submitted SBIR grants, NIH challenge grants and Connecticut stem cell research grants
- 2007-2008 **Cognate BioServices, Inc. - Chief Executive Officer** New Haven, CT
- Recruited to restructure cGMP cell manufacturing activities and expand stem cell tools capabilities
  - Developed and implemented a comprehensive corporate strategy to make Cognate the global leader in cell-based products and therapies
  - Coordinated global manufacturing, operations and R&D of cellular therapeutics at multiple sites
  - Led and managed team activities in specific areas of Preclinical Research, Assay Development, Regulatory Services, Process Development, Process Scale-up and cGMP Manufacturing.
- 1993-2007 **Pfizer, Inc. - Associate Research Fellow** Groton, CT
- As a lab supervisor in positions of increasing responsibility, explored and developed early-stage drug candidates and mechanisms in the areas of inflammation, arthritis, autoimmunity, neurodegeneration, anti-psychotics, osteoporosis, diabetes and cancer.
  - As a team member interfacing across a matrix of scientific disciplines, supervised scientists, led global project teams, coordinated pre-clinical research activities, initiated new discovery programs and served on transitional committees to develop new chemical entities for Phase I clinical trials
  - Discovered and validated key drug targets such as MMP-13, ADAM-17 and IKK $\beta$  for arthritis
  - Initiated therapeutic antibody approaches for cancer indications in partnership with Abgenix using their Xenomouse human monoclonal antibody technology
  - Managed external academic collaborations (Randy Noelle, Warner Greene, Jeanine D' Armiento) to identify and explore drug targets in the TNF, IL-1 and CD40 signaling pathways for inflammation, autoimmunity and cancer indications
  - Conceived and developed stem cell models as drug screening tools for safety and efficacy studies including an industry-first high throughput screen of 2.4M compounds using stem cell derived neurons
  - Designed stem cell-based RNAi screens to identify new drug targets for osteoporosis and diabetes
  - Established cancer stem cell models for target discovery and drug screening applications
  - Managed external collaboration with Stem Cell Sciences on the development of stem cell-derived neurons, cardiomyocytes and hepatocytes for specific drug screening applications

## RESEARCH, TEACHING AND OTHER EXPERIENCES

- 2000-Present **Connecticut College - Visiting Assistant Professor** New London, CT  
▪ Developer & teacher of upper-level immunology seminar course in the Department of Biology
- 2002-Present **New York Academy of Sciences - Steering Committee** New York, NY  
▪ Organizer of yearly seminar series and meetings for the Biochemical Pharmacology Discussion Group
- 2007-Present **Expedition New England - Scientific Consultant**  
▪ Advisor for program concepts and content
- 2008-Present **International Society for Cellular Therapy - Co-Chairman**  
▪ Co-chair of Legislative & Public Relations SubCommittee for Cell Therapy Commercialization Group
- 2008-Present **Vivo Biosciences, Inc. - Board of Directors** Birmingham, AL
- 2008 **Society for Biomolecular Sciences – Committee Chairman**  
▪ Served on annual meeting Organization Committee and as Conference Session Chair (Phenotypic vs. Mechanistic Screening: Primary Cells and Stem Cells in Drug Discovery)
- 1990-1993 **Yale University/Pfizer, Inc - Postdoctoral Research Associate** Groton & New Haven, CT  
▪ Discovered novel regulatory element in CD8 gene that evolved from repetitive *Alu* sequence
- 1985-1990 **Case Western Reserve University - Graduate Research Assistant** Cleveland, OH  
▪ Molecular and cell biology studies of CD8 in human T cell clones
- 1989 **Cleveland State University - Instructor** Cleveland, OH  
▪ Taught immunology and microbiology in the Department of Biology
- 1987-1989 **Cuyahoga Community College - Instructor** Cleveland, OH  
▪ Taught immunology for medical technologists in the Department of Respiratory Therapy
- 1984-1985 **Fort Hamilton-Hughes Memorial Hospital - Research Associate** Hamilton, OH  
▪ Generated monoclonal antibodies to tumor antigens and developed cytotoxicity assays
- 1983-1984 **James Gamble Institute for Medical Research - Research Associate** Cincinnati, OH  
▪ Generated monoclonal antibodies to Respiratory Syncytial Virus and studied viral infectivity
- 1981-1983 **Miami University – Graduate Research Assistant** Oxford, OH  
▪ Lab instructor for undergraduates in immunology, pathogenic microbiology and physiology

## EDUCATION

- 1990-1993 **Yale University/Pfizer, Inc. - Postdoctoral Research Associate** Groton and New Haven, CT  
▪ As Pfizer's first postdoctoral research associate in the lab of Dr. Jeffrey Hanke, initiated and progressed collaborative studies with Yale (Dr. Paula Kavathas) on developmental expression of CD8
- 1985-1990 **Case Western Reserve University – PhD in Pathology** Cleveland, OH  
▪ Dissertation: *Bifunctionality of the Human CD8 Molecule*  
▪ Advisors: Dr. David R. Kaplan and Dr. Mark L. Tykocinski  
▪ Published key paper (Ref. 24) on anti-sense RNA expression vector cited in over 500 patents
- 1981-1983 **Miami University – MS in Microbiology** Oxford, OH  
▪ Thesis: *Assessment of the Cellular Immune Response in Protein Malnourished Mice*  
▪ Advisor: Dr. John R. Stevenson
- 1977-1981 **Miami University – BA in Microbiology** Oxford, OH  
▪ Received Outstanding Undergraduate Research Award

## INVITED LECTURES

### **"CellDesign"**

Yale CURE BioHaven Entrepreneurship Series, March 25, 2009

### **"Commercialization of Stem Cells and Market Trends"**

2008 World Stem Cell Summit, Session on Stem Cells and Disease, September 23, 2008

### **"Designing Stem Cell-Based Physiologic Models for Modern Drug Discovery"**

Connecticut Stem Cell Technology Symposium on "Molecular Advances in the Discovery and Translation of Stem Cell Research", September 17, 2008

### **"Pharmaceutical Prospective on Induced Pluripotent Stem Cells (iPS Cells)"**

BIO2008 International Convention, Regenerative Medicine Breakout Session entitled "Is Cell De-differentiation a Commercial Reality of Scientific Curiosity?", June 17, 2008

### **"Stem Cells as Physiological Models for Modern Drug Discovery"**

Chinese Biopharmaceutical Association 13th Annual Conference and the 10th Annual Shanghai International Forum on Biotechnology and Pharmaceutical Industry (BIO-FORUM), May 30, 2008

### **"Stem Cell-Based Screening"**

CHI 7th Annual World Pharmaceutical Congress, Assays for Efficient and Safe Drug Development and 5th Annual Session on Cell-Based Assays for HTS, May 12, 2008

### **"How Stem Cell Technology Has Improved the Drug Discovery Process"**

GTCbio's 2nd Modern Drug Discovery and Development Summit, Stem Cell Research and Regenerative Medicine, December 4, 2006

### **"Stem Cell Models in Drug Discovery"**

Yale University Vascular Biology and Transplant Program Seminar, November 6, 2006

### **"Chemical and Functional Approaches Toward Regenerative Medicine"**

SRI 6th Annual Stem Cells and Regenerative Medicine Conference, October 16, 2006

### **"Stem Cell Technology in Pharmaceutical Drug Discovery"**

Society for Industrial Microbiology Annual Meeting, August 2, 2006

### **"Case Study: The Development and Use of Stem Cell Based Drug Discovery Assays"**

European Stem Cell and Regenerative Medicine Congress 2006, June 5, 2006

### **"How Stem Cell Technology Has Improved the Drug Discovery Process"**

CHI 4th International World Pharmaceutical Congress, Cell-Based Assays for HTS, May 26, 2006

### **"The Role of Stem Cell Models Used in the Compound Efficacy and Safety Assessment Phase of Drug Discovery"**

Marcus Evans 4th Annual Meeting, Commercialisation of Stem Cells 2006, March 13, 2006

### **"Efficacy and Safety Assessment of Targets and Compounds in Stem Cell Models"**

CHI Molecular Medicine Tri-Conference, Commercial Implications of Stem Cell Research: Recognizing the Reality of Stem Cell Research and its Promise, February 24, 2006

### **"Stem Cell Models for Target Identification, Validation, Drug Screening and Safety Assessment"**

GE Healthcare Cellular Analysis Symposium, October 1, 2005

### **"Stem Cell Models for Target Validation, Drug Screening and Safety Assessment"**

CHI, Stem Cell Research and Tissue Models for Therapeutics Conferences, August 29, 2005

### **"Identifying Potential Therapeutic Indications of Kinase Targets Using Genetically Engineered Mice and Cells"**

New York Academy of Sciences, September 28, 2004

### **"Application of Stem Cell Technologies in Drug Discovery" - Keynote Presentation**

University of Connecticut, Department of Molecular & Cellular Biology 16th Annual Retreat, August 28, 2004

### **"Stem Cells: Hype or Hope?"**

Wesleyan University - PIMMS/BEST (Project to Increase Mastery of Mathematics and Science / Beginning Educator Support & Training) Program for Exemplary Mathematics & Science Teachers, April 30, 2002

**“Properties and Uses of Differentiated Embryonic Stem Cells: Prospects for Application to Drug Discovery”**

University of Connecticut, Department of Molecular and Cellular Biology, March 9, 2001

**“Insights into Gene Function Using “Knockout” Embryonic Stem Cells”**

Case Western Reserve University, Department of Pathology, June 13, 2000

**“The Use of Embryonic Stem Cells as a Tool for Functional Genomics”**

Vanderbilt University, Department of Biological Sciences, April 5, 2000

**“Functional Genomics: Understanding the Language of Life”**

Wesleyan University, Departments of Biology and Molecular Biology, October 28, 1999

## BIBLIOGRAPHY

1. **Hambor J. E. Breaking the Stem Cell Technology Barrier: Designing Renewable, Physiologically Functional Cells for Modern Drug Discovery.** *World Stem Cell Report 2008*: 133-137, 2008.
2. **Hambor J. Our Bodies, Our Stem Cells.** *mammalian Cell & Tissue Culture Magazine* 1:26-29, 2008.
3. Imai K., Dalal S.S., **Hambor J.**, Mitchell P., Okada Y., Horton W.C., D'Armiento J. **Bone growth retardation in mouse embryos expressing human collagenase 1.** *Am. J. Physiol Cell Physiol.* 293:C1209-15, 2007
4. Buckbinder L., Crawford D.T., Qi H., Ke H.Z., Olson L.M., Long K.R., Bonnette P.C., Baumann A.P., **Hambor J.E.**, Grasser W.A., Pan L.C., Owen T.A., Luzzio M.J., Hulford C.A., Gebhard D.F., Paralkar V.M., Simmons H.A., Kath J.C., Roberts W.G., Smock S.L., Guzman-Perez A., Brown T.A., Li M. **Proline-rich tyrosine kinase 2 regulates osteoprogenitor cells and bone formation, and offers an anabolic treatment approach for osteoporosis.** *Proc. Natl. Acad. Sci. (USA)*10:10619-24, 2007.
5. Chaudhary K.W., Barzuefa N.X., Bauchmann M.B., Milici A.J., Beckius G., Stedman D.B., **Hambor J.E.**, Blake W.L., McNeish J.D., Bahinski A., Cezar G.G. **Embryonic Stem Cells in Predictive Cardiotoxicity: Laser Capture Microscopy Enables Assay Development.** *Toxicol. Sci.* 90:149-158, 2006.
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9. Garceau, N., Kosaka, Y., Masters, S., **Hambor, J. E.**, Shinkura, R., Honjo, T. and Noelle, R. J. Lineage-restricted function of NF- $\kappa$ B-Inducing Kinase (NIK) in transducing signals via CD40. *J. Exp. Med.* 191:381-386, 2000.
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## PATENTS

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- **WO2003083038** *Disruption of the REDK gene*, Allen-McConkey, M., Brissette, W., Hambor, J., Neote, K., Roach, M
- **US20030106085** *Disruption of Prostaglandin E Synthase gene*, Audoly, L., Francone, O., Haghpassand, M., Hambor, J., Roach, M., Stock, J.
- **WO2003045136** *Disruptions of the Prostaglandin E Synthase 2 gene*, Audoly, L., Francone, O., Haghpassand, M., Hambor, J., Roach, M., Stock, J.
- **US20040191902** *Growth and differentiation of ES cells*, Hambor, J., Roach, M.
- **WO2004087896** *Growth and differentiation of stem cells*, Hambor, J., Roach, M
- **WO2004039966** *Suspension method for producing embryoid bodies*, Gryseels, T., Hambor, J., Hawrylik, S., Roach, M.
- **WO2004087896** *Hepatocyte differentiation of stem cells*, Hambor, J., Roach, M.

## REFERENCES AVAILABLE UPON REQUEST