

## BIOGRAPHICAL SKETCH

Name: **Paul Viktor Lehmann, M.D., Ph.D.**

Position title: **CEO of CTL, Adj. Prof. Pathol. & Neurol. at CWRU**

### A. Education and Training:



INSTITUTION AND LOCATION	DEGREE	DATE	FIELD OF STUDY
Gymnasium Kastl, Kastl, Oberpfalz, Germany	B.A.	1976	Arts and Sciences
Medical School, Univ. of Tübingen, Germany	M.D.	1983	Medicine
Doctoral thesis, "Immune regulation by lipoproteins" Internal Medicine, Univ. of Tübingen, Germany	Ph.D.	1988	Immunology

### B. Personal Statement:

My entire research career revolved around immune monitoring. Initially I pursued this field entirely in the academic setting. In and instrumentation for improving the ability to reliably detect rare antigen-specific T cells in freshly isolated cell material, such as human blood. Not only have we been offering new developments to the scientific community, but we also have been the first ones to apply them in research, continuing to further the field. I personally have been trying to combine my new role as the head of a company that employs over 120 people, in the meantime, with directing research in our R&D department, and continued academic productivity in this field.

### C. Positions:

1986-1989 **Postdoctoral Scholar in Immunology** at Preclinical Research, Sandoz Ltd.,  
 1989-1993 **Senior Postdoctoral Scholar in Immunology** at (UCLA) with Dr. Eli E. Sercarz.  
 1993-1998 **Assistant Professor**, (CWRU), Dept. of Pathology & Neurology, Cleveland, OH.  
 1998-2002 **Associate Professor, Tenure** (CWRU), Dept. of Pathology & Neurology, Cleveland, OH.  
 2002-2008 **Full Professor with Tenure**, CWRU  
 2008-Present **CEO, CTL Adjunct Professor, CWRU, CSO, Co-Founder, CTL-MAT**

### D. Peer-reviewed Publications (ResearchGate: h-index 45, 205 publications, 11,185 citations):

- Adorini L, Muller S, Cardinaux F, Lehmann PV, Falcioni F, Nagy ZA. *In vivo competition between self peptides and foreign antigens in T cell activation.* **Nature**, 1988, 334, 623-625. ([Link](#))
- Adorini L, Sette A, Buus S, Grey HM, Darsley M, Lehmann PV, Doria G, Nagy ZA, Appella E. *Interaction of an immunodominant epitope with Ia molecules in T cell activation.* **Proc. Natl. Acad. Sci. U.S.A.**, 1988, 85, 5181-5. ([Link](#))
- Lehmann PV, Cardinaux F, Appella E, Muller S, Falcioni F, Adorini L, Nagy ZA. *Inhibition of T cell response with peptides is influenced by both peptide-binding specificity of major histocompatibility complex molecules and susceptibility of T cells to blocking.* **Eur. J. Immunol.**, 1989, 19, 1071-1077. ([Link](#))
- Nagy ZA, Lehmann PV, Falcioni F, Muller S, Adorini L. *Why peptides? Their possible role in the evolution of MHC-restricted T cell recognition.* **Immunol. Today**, 1989, 10, 132-138. ([Link](#))
- Falcioni F, Dembic Z, Muller S, Lehmann PV, Nagy ZA. *Flexibility of the T cell repertoire. Self tolerance causes a shift of T cell receptor gene usage in response to insulin.* **J. Exp. Med.**, 1990, 171, 1665-1681. ([Link](#))
- Lehmann PV, Schumm G, Moon D, Hurtenbach U, Falcioni F, Muller S, Nagy ZA. *Acute lethal graft-versus-host reaction induced by major histocompatibility complex class II-reactive T helper cell clones.* **J. Exp. Med.**, 1990, 171, 1485-1496. ([Link](#))
- Tary-Lehmann M, Rolink AG, Lehmann PV, Nagy ZA, Hurtenbach U. *Induction of graft versus host-associated immunodeficiency by CD4+ T cell clones.* **J. Immunol.**, 1990, 145, 2092-2098. ([Link](#))
- Lehmann PV, Drexler K, Tary-Lehmann M, Falcioni F, Hurtenbach U, Nagy ZA. *Graft-versus-host resistance induced by class II major histocompatibility complex-specific T cell clones.* **J. Exp. Med.**, 1991, 173, 333-341. ([Link](#))
- Lehmann PV, Forsthuber T, Miller A, Sercarz EE. *Spreading of T cell autoimmunity to cryptic determinants of an autoantigen.* **Nature**, 1992, 358, 155-157. ([Link](#))
- Kaufman DL, Clare-Salzler M, Tian J, Forsthuber T, Ting GS, Robinson P, Atkinson MA, Sercarz EE, Tobin AJ, Lehmann PV. *Spontaneous Loss of T Cell Tolerance to Glutamic Acid Decarboxylase in Murine Insulin-dependent Diabetes.* **Nature**, 1993, 366, 69-72. ([Link](#))
- Lehmann PV, Sercarz EE, Forsthuber T, Dayan CM, Gammon G. *Determinant spreading and the dynamics of the autoimmune T cell repertoire.* **Immunol. Today**, 1993, 14, 203-208. ([Link](#))

- Sercarz EE, Lehmann PV, Ametani A, Benichou G, Miller A, Moudgil K. *Dominance and crypticity of T cell antigenic determinants.* **Annu. Rev. Immunol.**, 1993, 11, 729-766. ([Link](#))
- Benichou G, Fedoseyeva E, Lehmann PV, Olson CA, Geysen HM, McMillan M, Sercarz EE. *Limited T cell response to donor MHC peptides during allograft rejection. Implications for selective immune therapy in transplantation.* **J. Immunol.**, 1994, 153, 938-945. ([Link](#))
- Bhardwaj V, Kumar V, Grewal IS, Dao T, Lehmann PV, Geysen HM, Sercarz EE. *T cell determinant structure of myelin basic protein in B10.PL, SJL/J, and their F1S.* **J. Immunol.**, 1994, 152, 3711-3719. ([Link](#))
- Tary-Lehmann M, Lehmann PV, Schols D, Roncarolo MG, Saxon A. *Anti-SCID mouse reactivity shapes the human CD4+ T cell repertoire in hu-PBL-SCID chimeras.* **J. Exp. Med.**, 1994, 180, 1817-1827. ([Link](#))
- Ransohoff R, Tuohy VK, Lehmann PV. *The immunology of multiple sclerosis: new intricacies and new insights.* **Curr. Opin. Neurol.**, 1994, 7, 242-249. ([Link](#))
- Tian J, Lehmann PV, Kaufman DL. *T cell cross-reactivity between coxsackievirus and glutamate decarboxylase is associated with a murine diabetes susceptibility allele.* **J. Exp. Med.**, 1994, 180, 1979-1984. ([Link](#))
- Tary-Lehmann M, Saxon A, Lehmann PV. *The human immune System in hu-PBL-SCID Mice.* **Immunol. Today**, 1995, 16, 529-533. ([Link](#))
- Forsthuber T, Yip HC, Lehmann PV. *Induction of TH1 and TH2 immunity in neonatal mice.* **Science**, 1996, 271, 1728-1730. ([Link](#))
- Le Grice SF, Whalen CC, Hom DL, Lehmann PV, Walker CJ. *Perspective: research highlights at the Case Western Reserve University Center for AIDS Research. Learning from the past and looking toward the future.* **AIDS Res. Hum. Retroviruses**, 1996, 12, 1659-1666. ([Link](#))
- Lehmann PV. *Immunomodulation by proteolytic enzymes.* **Nephrol. Dial. Transplant.**, 1996, 11, 952-955. ([Link](#))
- Tian J, Atkinson MA, Clare-Salzler M, Herschenfeld A, Forsthuber T, Lehmann PV, Kaufman DL. *Nasal administration of glutamate decarboxylase (GAD65) peptides induces Th2 responses and prevents murine insulin-dependent diabetes.* **J. Exp. Med.**, 1996, 183, 1561-1567. ([Link](#))
- Tian J, Clare-Salzler M, Herschenfeld A, Middleton B, Newman D, Mueller R, Arita S, Evans C, Atkinson MA, Mullen Y, Sarvetnick N, Tobin AJ, Lehmann PV, Kaufman DL. *Modulating autoimmune responses to GAD inhibits disease progression and prolongs islet graft survival in diabetes-prone mice.* **Nat. Med.**, 1996, 2, 1348-1353. ([Link](#))
- Lehmann PV. *Immunological tolerance.* **Science**, 1996, 272, 1404-1406. ([Link](#))
- Chu RS, Targoni OS, Krieg AM, Lehmann PV, Harding CV. *CpG oligodeoxynucleotides act as adjuvants that switch on T helper 1 (Th1) immunity.* **J. Exp. Med.**, 1997, 186, 1623-1631. ([Link](#))
- Lehmann PV, Matesic D, Benichou G, Heeger PS. *Induction of T helper 2 immunity to an immunodominant allopeptide.* **Transplantation**, 1997, 64, 292-296. ([Link](#))
- Tian J, Lehmann PV, Kaufman DL. *Determinant spreading of T helper cell 2 (Th2) responses to pancreatic islet autoantigens.* **J. Exp. Med.**, 1997, 186, 2039-2043. ([Link](#))
- Birnbaum G, Kotilinek L, Miller SD, Raine CS, Gao YL, Lehmann PV, Gupta RS. *Heat shock proteins and experimental autoimmune encephalomyelitis. II: environmental infection and extra-neuraxial inflammation alter the course of chronic relapsing encephalomyelitis.* **J. Neuroimmunol.**, 1998, 90, 149-161. ([Link](#))
- Lehmann PV. *The fate of T cells in the brain: veni, vidi, vici and veni, mori.* **Am. J. Pathol.**, 1998, 153, 677-680. ([Link](#))
- Lehmann PV, Targoni OS, Forsthuber TG. *Shifting T cell activation thresholds in autoimmunity and determinant spreading.* **Immunol. Rev.**, 1998, 164, 53-61. ([Link](#))
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- Targoni OS, Lehmann PV. *Endogenous myelin basic protein inactivates the high avidity T cell repertoire.* **J. Exp. Med.**, 1998, 187, 2055-2063. ([Link](#))
- Targoni OS, Tary-Lehmann M, Lehmann PV. *Prevention of murine EAE by oral hydrolytic enzyme treatment.* **J. Autoimmun.**, 1999, 12, 191-198. ([Link](#))
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- Karulin AY, Hesse MD, Yip HC, Lehmann PV. *Indirect IL-4 pathway in type 1 immunity. J. Immunol.*, 2002, 168, 545-553. [\(Link\)](#)
- Meierhoff G, Ott PA, Lehmann PV, Schloot NC. *Cytokine detection by ELISPOT: relevance for immunological studies in type 1 diabetes. Diabetes Metab. Res. Rev.*, 2002, 18, 367-380. [\(Link\)](#)
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- Anthony DD, Lehmann PV. *T cell epitope mapping using the ELISPOT approach. Methods*, 2003, 29, 260-269. [\(Link\)](#)
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- Ott PA, Dittrich MT, Herzog BA, Guerkov R, Gottlieb PA, Putnam AL, Durinovic-Bello I, Boehm BO, Tary-Lehmann M, Lehmann PV. *T cells recognize multiple GAD65 and proinsulin epitopes in human type 1 diabetes, suggesting determinant spreading.* **J. Clin. Immunol.**, 2004, 24, 327-339. ([Link](#))
- Berner BR, Tary-Lehmann M, Yonkers NL, Askari AD, Lehmann PV, Anthony DD. *Phenotypic and functional analysis of EBV-specific memory CD8 cells in SLE.* **Cell. Immunol.**, 2005, 235, 29-38. ([Link](#))
- Hetherington VJ, Kawalec JS, Dockery DS, Targoni OS, Lehmann PV, Nadler D. *Immunologic testing of xeno-derived osteochondral grafts using peripheral blood mononuclear cells from healthy human donors.* **BMC. Musculoskelet. Disord.**, 2005, 6, 36. ([Link](#))
- Hofstetter HH, Karulin AY, Forsthuber TG, Ott PA, Tary-Lehmann M, Lehmann PV. *The cytokine signature of MOG-specific CD4 cells in the EAE of C57BL/6 mice.* **J. Neuroimmunol.**, 2005, 170, 105-14. ([Link](#))
- Hofstetter HH, Targoni OS, Karulin AY, Forsthuber TG, Tary-Lehmann M, Lehmann PV. *Does the frequency and avidity spectrum of the neuroantigen-specific T cells in the blood mirror the autoimmune process in the central nervous system of mice undergoing experimental allergic encephalomyelitis?* **J. Immunol.**, 2005, 174, 4598-605. ([Link](#))
- Kuekrek H, Schlingmann T, Valdez H, Boehm BO, Pollard RB, Mitsuyasu R, Goebel FD, Lederman MM, Lehmann PV, Tary-Lehmann M. *Differential effect of interleukin-2 treatment on primary and secondary immunizations in HIV-infected individuals.* **AIDS**, 2005, 19, 1967-1974. ([Link](#))
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- Hofstetter HH, Kovalovski A, Shive C, Lehmann PV, Forsthuber TG. *Neonatal induction of myelin-specific Th1/Th17 immunity does not result in experimental autoimmune encephalomyelitis and can protect against the disease in adulthood.* **J. Neuroimmunol.**, 2007, 187, 20-30. ([Link](#))
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#### D. Former Trainees who became Faculty:

Peter Heeger, MD, now Professor at Mount Sinai, NY  
 Thomas Forsthuber, MD, PhD, now Professor University of Texas, San Antonio  
 Michael Anderson, MD, now Associate Professor at CWRU (mentor on his KO8)  
 Heinfred Radeke, MD, PhD, now Associate Professor at University Frankfurt, Germany  
 Clara Pelfrey, PhD, now Associate Professor at CWRU/CCF  
 Don Anthony, MD, now Associate Professor at CWRU  
 Stefanie Kuerten, MD, PhD, now Professor at University of Erlangen, Germany

#### Postdoctoral trainees:

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 Oleg Targoni, Ph.D.  
 Patrick Ott, MD  
 Frauke Rininsland, Ph.D.  
 Beate Berner, MD  
 Wenji Zhang, MD  
 Tobias Schlingman, MD  
 Ioana Moldovan, MD  
 Thomas Kleen, Ph.D.  
 Thomas Hattier, Ph.D.  
 Peter Heeger, MD  
 Thomas Forsthuber, MD, Ph.D.  
 Michael Anderson, MD  
 Heinfred Radeke, MD, Ph.D.  
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 Don Anthony, MD  
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#### Doctoral thesis mentor to:

Hualin Yip-Cheng	Kai Loewenbrueck
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Maike Hesse	Tobias Nowacki
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## E. Honors:

- 2002-2006 **Permanent Member of NIH Study Section:** Immunological Sciences, renamed: Hypersensitivity, Autoimmunity, and Immune-mediated Diseases Study Section (HAI), Chair, NIH NIAID Special Emphasis Panel ZAI1BLGIS1 T Cell Immunology, 2007. Ad Hoc NIH Reviewer; NIH, NIAID RFP-DAIT-BAA-05-11 *"Immune function and biodefense in children, elderly and immune compromised populations,"* May 2-3, 2005. NIH, Special Emphasis Panel ZRG1 SSS-J 01 R, Dec 4, 2001; NIH, Special Emphasis Panel *"Sex-Based Differences in the Immune Response,"* RFA AI-01-005, November 7-8, 2001; NIH, Metabolism Study Section, Council MET, October 25-26, 2001; NIH, Council ZRG1 SS-T 10 B, July 09, 2001; NIH, Immunological Sciences Study Section, June 21-22, 2001; NIH NIAID *"Innovation Grants on Immune Tolerance"* Special Emphasis Panel, Council Za/1 NN-1 M1, 02/08/01; NIH, SBIR grants ZRG1 SSS-T 10B, 11-13-200; NIH, Experimental Immunology Study Section, Nov. 29., 1999; NIH, Immunological Sciences Study Section, Feb 1999; NIH NIAID Autoimmunity Centers of Excellence Reviewer, June 28, 1999; NIH HLBI, Special Emphasis Panel on *"Immunogenetics of Inhibitor Formation in Hemophilia"* June 1996; NIH NIAID Program Project Grant Review and site visit: PI: H. McDevitt *"HLA-transgenic NOD Mice,"* July 22 - 24, 1998.
- 2001-2005 **Associate Editor:** *The Journal of Immunology.*  
Reviewer for Journals: *The Journal of Immunology, Nature Medicine, The Journal of Experimental Medicine, Immunity, The Journal of Clinical Investigation, Journal of Virology, International Immunology, Cellular Immunology, Journal of Neuroimmunology, Autoimmunity, American Journal of Pathology, Nephritis Dialysis Transplantation, Life Sciences, Biotechnology*