CHEMICAL HERITAGE FOUNDATION

HANS C. OETTGEN

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview Conducted by

William Van Benschoten

at

Harvard University Cambridge, Massachusetts

on

21 and 22 January 2004

From the Original Collection of the University of California, Los Angeles



Hans C. Oettgen

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HANS C. OETTGEN

1958	Born in Cologne, Germany, on 23 January
	Education
1980 1987	B.A., Williams College MD/PhD, Immunology, Harvard Medical School
	Professional Experience
	Children's Hospital, Boston, Massachusetts
1987-1990	Resident in Pediatrics
1990-1994	Clinical Immunology Fellow
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1987-1993	Clinical Fellow in Pediatrics
1994-1995	Instructor in Pediatrics
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1979	Phi Beta Kappa, Williams College
1980	Sigma Xi, Williams College
1980	Highest Honors in Chemistry, Williams College

- 1987 Shipley Prize for Research, Harvard Medical School
- 1991 Janeway Research Scholarship, Children's Hospital, Boston, MA
- 1995 Allergy Research Award, Pharmacia Allergy Research Foundation
- 1995 Education and Research Trust Award, American Academy of Allergy,
- Asthma and Immunology
- 1996 Pew Scholars Program in the Biomedical Sciences Grant

Selected Publications

Oettgen H, Bayard PJ, van Ewijk W, Nadler LM, Terhorst C. Further biochemical studies of the human B-cell differentiation antigens B1 and B2. Hybridoma 1983;2:17-28.

Borst J, Coligan JE, Oettgen HC, Pessano S, Malin R, Terhorst C. The delta and epsilon chains of the human T3/T-cell receptor complex are distinct polypeptides. Nature 1 984;3 12:455-45 8.

- Oettgen H, Kappler J, Tax WJM, Terhorst C. Characterization of the two heavy chains of the T3 complex on the surface of human T lymphocytes. J. Biol. Chem. 1984;259:12039-12048.
- Taylor A, Surgenor T, Thomson DK, Graham RJ Oettgen H. Comparison of leucine aminopeptidase from human lens, beef lens and kidney and hog lens and kidney. Expl. eye Res. 1984;38:217-229.
- Oettgen HC, Taylor A. Purification, preliminary characterization, and immunological comparison of hog lens leucine aminopeptidase (EC 3.4.11.1) with hog kidney and beef lens aminopeptidases. Anal Biochem 1985; 146:238-245.
- Oettgen HC, Terhorst C, Cantley LC, Rossoff P. Stimulation of the T3-T cell receptor complex induces a membrane potential-dependent calcium influx. Cell 1985;40:583-590.
- Pessano S, Oettgen H, Bhan A, Terhorst C. The T3/T cell receptor complex: antigenic distinction between the two 20-kD T3 (T3-delta and T3-epsilon) subunits. EMBO J 1985; 14:337-344.
- Katzen D, Umetsu D, Miller R, Maher M, Oettgen H, Terhorst C, Geha RS. Requirements for activation of human peripheral blood T cells by mouse monoclonal antibodies to CD3. Clin. Immunol Immunopathol 1 986;43 :48-64.
- Oettgen HC, Pettey C, Maloy WL. Terhorst C. A T3-like protein complex associated with the antigen receptor on murine T cells. Nature 1986;320:272-275.
- Reiser H, Oettgen H, Yeh ETH, Terhorst C, Low MG, Benacerraf B. Rock KL. Structural characterization of the TAP molecule: A phosphatidyl inositol-linked glycoprotein. Cell 1 986;47:365-370.
- Oettgen HC, Martin TR, Wynshaw-Boris A, Deng C, Drazen JM. Leder P. Active Anaphylaxis in IgE-Deficient Mice. Nature 1 994;370: 367-370.
- Rothenberg ME, Ownbey R, Mehlhop P, Loiselle PM, van de Rijn M, Bonventre JV, Oettgen HC, Leder P. Luster AD. Eotaxin triggers eosinophil selective chemotaxis and calcium flux via a distinct receptor and induces pulmonary eosinophilia in the presence of interleukin-5 in mice. Molecular Medicine 1996;2:334-348.
- King CL, Jia X, Malhotra I, Mahmoud AAF. Oettgen HC. Mice with a targeted deletion of the IgE gene have increased worm burdens and reduced granulomatous inflammation following primary infection with *Schistosoma mansoni*. J Immunol 1997,158: 294-300.
- Mehlhop PD, van de Rijn M, Goldberg AB, Brewer JP, Kurup, VP, Martin TR. Oettgen, HC. Allergen-induced bronchial hyperreactivity and eosinophilic inflammation occur in the absence of IgE in a mouse model of asthma. Proc Natl Acad Sci U.S.A. 1997;94:1344-1399.
- Kokron CM, Bonilla FA, Oettgen HC, Ramesh R, Geha, RS. Pandolfi, F. Searching for genes involved in the pathogenesis of primary immunodeficiency diseases: lessons from mouse knockouts. Clin Immunol 1997;17:109-126.
- Yamaguchi M, Lantz, CS, Oettgen, HC, Katona IM, Fleming T, Miyajima I, Kinet J-P. Galli SJ. IgE enhances mouse mast cell Fc(epsilon)RI expression *in vitro* and *in vivo*. Evidence for a novel amplification mechanism for IgE-dependent reactions. J Exp Med 1997;185:663-672.
- Lantz CS, Yamaguchi M, Oettgen HC, Katona I, Miyajima I, Kinet J-P. Galli SJ. IgE regulates mouse basophil Fc(epsilon)RI expression *in vivo*. J Immunol 1997;158:2517-2521.
- van de Rijn M, Mehlhop PD, Judkins A, Rothenberg ME, Luster AD. Oettgen HC. A murine

model of allergic rhinitis: Studies on the role of IgE in pathogenesis and analysis of eosinophil influx elicited by allergen and by eotaxin. J Allergy Clin Immunol 1998;102:65-74.

- Kisselgof AB. Oettgen HC. The expression of murine B cell CD23, *in vivo*, is regulated by its ligand, IgE. Int Immunol 1998; 10:1377-1384.
- Huang WW, Sauty A, Garcia-Zepeda EA, Oettgen HC, Rothenberg ME. Luster AD. Molecular and biological characterization of the murine leukotriene B4 receptor expressed on eosinophils. J Exp Med 1998;188:1063-1074.
- Sayos J, Wu C, Morra M, Wang N, Zhang X, van Shaik AD, Notorangelo L, Geha R, Roncarollo MG, Oettgen H, De Vries J. Terhorst C. SAP, the protein encoded by the Xlinked lymphoproliferative disease gene, regulates signal transduction events induced through the co-receptor molecule SLAM. Nature 1 998;3 95:462-469
- Spergel JM, Mizoguchi E, Oettgen H, Bhan AK. Geha RS Roles of TH1 and TH2 cytokines in a murine model of allergic dermatitis. J Clin Invest 1999;103:1 103-1111.
- Seidl KJ, Manis JP, Bottaro A, Zhang J, Davidson L, Kisselgof A, Oettgen H. Alt FW Positiondependent inhibition of class switch recombination by PGK-Neo^r cassettes inserted into the immunoglobulin heavy chain constant region locus. Proc Natl Acad Sci U.S.A. 1 999;96:3000-3005
- Pivniouk VI, Martin TR, Lu-Kuo JM, Katz HR, Oettgen HC. Geha RS. SLP-76 deficiency impairs signaling via the high affinity IgE receptor in mast cells. J Clin Invest 1999; 103 : 1737-1743.
- Mehlhop PD, van de Rijn M, Brewer, JP, Kisselgof AB, Geha RS, Oettgen HC. Martin TR. CD40L but not CD40 is required for allergen-induced bronchial hyperresponsiveness in mice. Am J Respir Cell Mol Biol 2000;23:646-651.
- The last authors contributed equally to this publication. The work was carried out by my fellow, Dr. Mehlhop. Dr. Martin and I alternated last authorship through our collaboration (see ref. 14)
- Woodward A, Alenius H, Spergel JM, Mizoguchi E, Bhan AK, Castigli E, Oettgen H. Geha RS Role of T cells and CD40 ligand (CD40L)-CD40 interactions in a murine model of allergic dermatitis. J Allergy Clin Immunol 2001;107:359-66.
- Lloyd CM, Gonzalo J-A, Nguyen T, Delaney T, Tian J, Oettgen H, Coyle AJ. Gutierrez-Ramos JC. Resolution of bronchial hyperresponsiveness and pulmonary inflammation is associated with IL-3 and tissue leukocyte apoptosis. J Immunol 2001;166:2033-2040.
- Morra M, Silander O, Calpe S, Choi M, Oettgen H, Myers L, Etzioni A, Buckley, R. Terhorst C. Alterations of the X-linked lymphoproliferative disease gene SH2D1A in common variable immunodeficiency syndrome. Blood 2001 ;98: 132 1-1325
- Alenius H, Laouini D, Woodward A, Mizoguchi E, Bhan AK, Castigli E, Oettgen HC. Geha RS. Mast cells regulate IFN-gamma expression in the skin and circulating IgE levels in allergen-induced skin inflammation. J Allergy and Clin Immunol 2002;109:106-13
- Laufs H, Nigrovic PA, Schneider LC, Oettgen H, Del NP, Moskowitz IP, Blume E, Perez-Atayde AR. Giant cell myocarditis in a 12-year-old girl with common variable immunodeficiency. Mayo Clin Proc 2002;77:92-6.
- Ma W, Bryce PJ, Humbles AA, Laohini D, Yalcindag A, Alenius H, Friend DS, Oettgen HC, Gerard G. Geha RS. CCR3 is essential for skin eosinophilia and airway hyprerresponsiveness in a murine model of allergic skin inflammation. J Clin Invest

2002;109:621-628.

- MacGinnitie AJ, Walensly LD, Turvey SE, Orange JS, Bonilla FA, Silverman LB. Oettgen H Management of an anaphylactoid reaction to methotrexate with a stepwise graded challenge. Ped All Immunol In press.
- Bryce PJ, Geha R. Oettgen H Desloratadine inhibits allergen-induced airway inflammation and bronchial hyperresponsiveness and alters T cell responses in murine models of asthma. J Allergy Clin Immunol 2003; 112:149-58.
- Blaeser F, Bryce PJ, Ho N, Raman V, Dedeoglu F, Geha RS, Oettgen HC. Chatila TA Targeted Inactivation of the IL-4 Receptor alpha chain I4R Motif Promotes Allergic Airway Inflammation. J Exp Med 2003;198:1189-200.
- Laouini D, Alenius H, Bryce P, Oettgen H, Tstisikov E, Geha R IL-10 is critical for Th2 responses in a murine model of allergic dermatitis. J Clin Invest 2003;1 12:1058-1056.
- Phipatanakul W, Cronin B, Wood RA, Eggleston PA, Shih M-C, Song L. Oettgen HC. Environmental Intervention Trial to Reduce Mouse Allergen Exposure in Boston Inner-City Children with Asthma. Ann. Allergy, Asthma and Immunol. In press.
- Gurish MF, Bryce PJ, Kisselgof AB, Thornton EM, Miller HR, Friend DS, Oettgen HC IgE enhances parasite clearance and regulates mast cell responses in mice infected with *Trichinella spiralis* J Immunol 2003 in press.
- Laouini D, Kawamoto S, Yalcindag, A, Bryce P, Mizoguchi E, Oettgen H, Geha R, Epicutaneous sensitization with superantigen induces allergic skin inflammation. J Allergy Clin Immunol 2003;112:981-987.
- MacGinnitie AJ, Walensky LD, Turvey SE, Orange JS, Bonilla FA, Silverman LB, Oettgen HC. Management of an anaphylactoid reaction to methotrexate with a stepwise graded challenge. Pediatr Allergy Immunol. 2003:409-411.
- Oettgen H,. Terhorst C. A review of the structure and function of the T cell receptor-T3 complex. In: CRC Critical Reviews, Boca Raton: CRC Press, 1986;7:131-167.
- Oettgen H. Terhorst C. The T cell receptor-T3 complex and T cell activation. Human Immunol. 1986;18:187-204.
- Terhorst C, Georgopoulos K, Gold D, Oettgen H, Pettey C, Ucker D, van den Elsen P. The human and mouse T3/T cell receptor complex. In: Crumpton, M and Feldmann, M, eds. Regulation of Immune Gene Expression. Clifton: The Humana Press, 1986:75-83.
- Terhorst C, De Vries J, Georgopoulos K, Gold D, Oettgen H, Pettey C, Spits H, Ucker D, Van den Elsen P, and Wileman T. The T-cell receptor/T3 complex. In: The Year in Immunology 1985-1986. Basel: Karger, Basel, 1986;2:245-253.
- Bonilla FA and Oettgen HC Normal ranges for lymphocyte subsets in children. J Pediatrics 1997; 130:347-349.
- Oettgen HC, Review of Cytokine Knockouts edited by S.K. Durum and K. Muegge. Immunol Today 1998;19:487.
- Oettgen HC. Geha RS IgE in asthma and atopy: cellular and molecular connections. J Clin Invest 1999:104:829-835.
- Oettgen HC. Geha RS Asthma and the new Millenium. Cell 1999;96:459-461.
- Oettgen HC. Regulation of the IgE isotype switch: new insights on cytokine signals and the functions of epsilon-germline transcripts. Curr Opin Immunol 2000; 12:618-23.
- Oettgen HC. Geha RS IgE Regulation and Roles in Asthma Pathogenesis. J Allergy Clin Immunol. 2001; 107:429-40.

Oettgen HC, Geha RS. Regulation and biology of Immunoglobulin E. In: Leung DYM, Sampson HA, Geha RS, Szefler SJ, editors. Pediatric allergy: principles and practice. St. Louis; Mosby; 2003. p. 39-50.

ABSTRACT

Hans C. Oettgen was born in Cologne, Germany, spent some time in Nairobi, Kenya, but was raised mostly in New Canaan, Connecticut, the eldest of three children. His mother was a teacher; his father was a researcher in immunology and a physician in internal medicine who, eventually, worked at Memorial Sloan-Kettering Cancer Center in New York City. Oettgen enjoyed school, especially math, reading, and spending time outdoors. His family often went camping in the Adirondacks and spent summers traveling by train and/or by boat throughout Europe. He had a chemistry set though his interest in math led him more towards computer programming than performing experiments. He spent time in his father's lab during his childhood, but in high school he worked in some of his father's colleagues labs, mostly doing technical work without understanding the fundamental scientific questions being investigated, until he had the chance to do research involving the isolation of a particular protein from peanuts, called peanut lectin, which binds to a sugar structure and is expressed on some cancer malignancies. He was also in the Boy Scouts of America, was (and is) an avid photographer, and knew that he wanted a broad liberal arts education even though he intended to pursue science or medicine as a career.

Oettgen matriculated at Williams College, majoring in chemistry, but ultimately choosing to attend medical school. He began his medical studies at the Harvard Medical School; the summer after his first year, though, gave him the chance to work with Cornelius P. Terhorst at the Dana-Farber Cancer Center conducting research on B lymphocytes, using protein chemistry to describe B-1 and B-2. While at Harvard he decided to move into the MD/PhD program and continued to work with Terhorst, writing his thesis on the biochemical characterization of T-cell-receptor structure. After completing his residency in 1990, Oettgen was slotted to undertake a postdoctoral fellowship with David Baltimore at the Whitehead Institute, but Baltimore's move to Rockefeller University in New York City prompted Oettgen to do his fellowship with Philip Leder in genetics. As a postdoc he developed a mouse without the gene for immunoglobulin E (IgE). He then accepted a position at Children's Hospital in Boston, Massachusetts, researching the role of IgE in immune function.

At the end of the interview Oettgen talks about the process of writing journal articles; balancing family and career; his leisure activities; the source of his ideas; and the impact of technology on his work. He concludes the interview with a discussion of competition and collaboration in science; the grant-writing process; the role of the scientist in educating the public about science; the impact of the Pew Scholars Program in the Biomedical Sciences on his work; his children; and the benefits of having a clinical practice and doing basic science.

UCLA INTERVIEW HISTORY

INTERVIEWER:

William Van Benschoten, Interviewer, UCLA Oral History Program. B.A., History, University of California, Riverside; M.A., History, University of California, Riverside; C. Phil., History, UCLA

TIME AND SETTING OF INTERVIEW:

Place: Oettgen's office, Harvard University.

Dates, length of sessions: January 21, 2004 and January 22, 2004

Total number of recorded hours: 4.0

Persons present during interview: Oettgen and Van Benschoten.

CONDUCT OF INTERVIEW:

This interview is one in a series with Pew Scholars in the Biomedical Sciences conducted by the UCLA Oral History Program in conjunction with the Pew Charitable Trusts's Pew Scholars in the Biomedical Sciences Oral History and Archives Project. The project has been designed to document the backgrounds, education, and research of biomedical scientists awarded four-year Pew scholarships since 1988.

To provide an overall framework for project interviews, the director of the UCLA Oral History Program and three UCLA faculty project consultants developed a topic outline. In preparing for this interview, Van Benschoten held a telephone preinterview conversation with Oettgen to obtain written background information (curriculum vitae, copies of published articles, etc.) and agree on an interviewing schedule. He also reviewed documentation in Oettgen's file at the Pew Scholars Program office in San Francisco, including Oettgen's proposal application, letters of recommendation, and reviews by Pew Scholars Program national advisory committee members.

ORIGINAL EDITING:

Carol Squires edited the interview. She checked the verbatim transcript of the interview against the original tape recordings, edited for punctuation, paragraphing, and spelling, and verified proper names. Words and phrases inserted by the editor have been bracketed.

Oettgen reviewed the transcript. He verified proper names and made minor corrections and additions.

Carol Squires prepared the table of contents and TechniType Transcripts compiled the guide to proper names.

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