

CHEMICAL HERITAGE FOUNDATION

THEODORE S. JARDETZKY

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

William Van Benschoten

at

The Home of Theodore S. Jardetzky

on

3, 4, and 5 June 2002

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



Theodore S. Jardetzky

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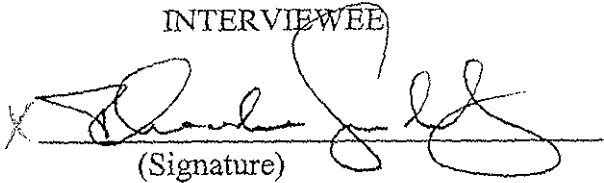
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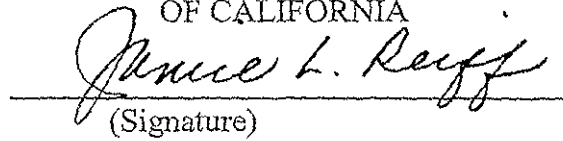
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THEODORE S. JARDETZKY

1960 Born in Boston, Massachusetts, on 12 August

Education

1982 B.S. with honors, Chemistry, Stanford University

1986 Ph.D. *summa cum laude*, Biophysical Chemistry, University of Basel

Professional Experience

1982-1986 University of Basel, Basel, Switzerland
Pre-doctoral Fellow

1986-1986 Postdoctoral Fellow

1986-1994 Harvard University, Cambridge, Massachusetts
Postdoctoral Fellow

1994-2000 Northwestern University, Evanston, Illinois
Assistant Professor

2000-present Associate Professor, Department of Biochemistry, Molecular
Biology and Cell Biology and Department of Microbiology and
Immunology

Honors

1986 Ph.D. awarded *summa cum laude*

1990-1993 Post-doctoral Fellowship, Cancer Research Institute

1996-2000 Pew Scholars Program in the Biomedical Sciences Grant

1999-present Investigator Award, Cancer Research Institute

2000 Ad-hoc Member, NIH Allergy & Immunology Study Section

2000-present Member, NIH Allergy & Immunology Study Section

2001-present Scholar of the Leukemia & Lymphoma Society

2001-present NIH MERIT Award

2002-present Henry and Soretta Shapiro Research Professor in Molecular Biology

Selected Publications

J. P. Priestle, M.G. Grutter, J.L. White, M.G. Vincent, M. Kania, E. Wilson, T.S. Jardetzky, K.

- Kirschner and J.N. Jansonius. (1987). Three-dimensional structure of the bifunctional enzyme N-(5'-phosphoribosyl)anthranilate isomerase-indole-3-glycerol-phosphate synthase from *Escherichia coli*. *Proc. Natl. Acad. Sci.*, 84, 5690-5694.
- K. Kirschner, H. Szadkowski, T.S. Jardetzky and V. Hager. (1987). Phosphoribosylanthranilate isomerase-indoleglycerol-phosphate synthase from *Escherichia coli*. *Methods in Enzymology*, 142, 3 86-397.
- T.S. Jardetzky and M. Seville. (1988). Calculation of rate and equilibrium constants for a Ping-Pong mechanism from steady-state data. *Biochemistry*, 27, 675 8-6763.
- J.H. Brown, T.S. Jardetzky, M.A. Saper, B. Samraoui, P.J. Bjorkman and D.C. Wiley. (1988). A hypothetical model of the foreign antigen binding site of class II histocompatibility molecules. *Nature*, 332, 845-850.
- T.S. Jardetzky, J.C. Gorga, R. Busch, J. Rothbard, J.L. Strominger and D.C. Wiley. (1989). Purification of complexes between peptide antigens and class II major histocompatibility antigens using biotinylated peptides. In, *Proceedings of the 10th Ettore Majorana NATO Summer Institute on "Protein Structure and Engineering"*, Plenum Press.
- T.S. Jardetzky, J.C. Gorga, R. Busch, J. Rothbard, J.L. Strominger and D.C. Wiley. (1990). Peptide Binding to HLA-DR1: A peptide with most residues replaced by polyalanine retains MHC binding. *EMBO J.*, 6, 1797-1803.
- J. Kilgus, T.S. Jardetzky, J. Gorga, A. Trzeciak, D. Gillessens, J.L. Strominger and F. Sinigaglia. (1990). Structural analysis of the permissive association of a malaria T cell epitope with DR molecules. *J. Immunol.*, 146, 307-3 15.
- J.C. Gorga, J.H. Brown, T.S. Jardetzky, D.C. Wiley and J.L. Strominger. (1991). Crystallization of HLA-DR antigens. *Res. Immunol.*, 142, 401-407.
- T.S. Jardetzky, W.S. Lane, R.A. Robinson, D.R. Madden and D.C. Wiley. (1991). Identification of self peptides bound to purified HLA-B27. *Nature*, 353, 326-329
- H-C. Guo, T.S. Jardetzky, T.P.J. Garrett, W.S. Lane, J.L. Strominger and D.C. Wiley. (1992). Different length peptides bind to HLA-Aw68 similarly at their ends but bulge out in the middle. *Nature*, 360, 364-366
- H.-C. Guo, D.R. Madden, M.L. Silver, T.S. Jardetzky, J.C. Gorga, J.L. Strominger and D.C. Wiley. (1993). Comparison of the P2 specificity pocket in three human histocompatibility antigens: HLA-A*680 1, HLA-A*020 1 and HLA-B*2705. *Proc. Natl. Acad. Sci.*, 90, 8053-8057.
- J.H. Brown, T.S. Jardetzky, J.C. Gorga, L.J. Stern, R.G. Urban, J.L. Strominger and D.C. Wiley. (1993). The three-dimensional structure of the human class II histocompatibility antigen HLA-DR1. *Nature*, 364, 33-39.
- L.J. Stern, J.H. Brown, T.S. Jardetzky, J.C. Gorga, R.G. Urban, J.L. Strominger and D.C. Wiley. (1994). Crystal structure of the human class II MHC protein HLA-DR1 complexed with an influenza virus peptide. *Nature*, 368, 215-221.
- T.S. Jardetzky, J.H. Brown, J.C. Gorga, L.J. Stern, Y-I. Chi, C. Stauffacher, R.G. Urban, J.L. Strominger and D.C. Wiley. (1994). The three-dimensional structure of a human class II histocompatibility molecule:superantigen complex. *Nature*, 368, 711- 717.
- J. Thibodeau, I. Cloutier, N. Labreque, W. Mourad, T. Jardetzky and R. -P. Sékaly. (1994). Subsets of HLA-DR1 Molecules Defined by SEB and TSST-1 Binding. *Science*, 266, 1874-1878.
- T. S. Jardetzky. (1995). Structural studies of the interaction of superantigens with class II Major

- Histocompatibility Complex molecules. In, *Bacterial Superantigens: Structure, Function and Therapeutic Potential*, Eds. J. Thibodeau and R. -P. Sékaly, R.G. Landes Co.
- P.H. Shafer, S.K. Pierce and T.S. Jardetzky. (1995). The Structure of MHC Class II: Role for the Dimer of Dimers. *Seminars in Immunology*, 7, 3 89-398.
- J.H. Brown, T.S. Jardetzky, L.J. Stern, J.C. Gorga, J.L. Strominger and D.C. Wiley. (1995). Human Class II MHC Molecule HLA-DR1: X-ray Structure Determined from Three Crystal Forms. *Acta Cryst.*, D51, 946-961.
- T.S. Jardetzky, J.H. Brown, J.C. Gorga, L.J. Stern, R.G. Urban, J.L. Strominger and D.C. Wiley. (1996). Crystallographic analysis of endogenous peptides associated with HLA-DR1 suggests a common, polyproline II-like conformation for bound peptides. *Proc. Natl. Acad. Sci.*, 93, 734-73 8.
- T.S. Jardetzky. (1996). Crystal Structures of HLA Class I and Class II Molecules. In, *HLA/MHC: genes, molecules & function*, Eds. M.J. Browning and A.J. McMichael, βIOS Scientific Publishers; Human Molecular Genetics Series.
- T. S. Jardetzky. (1996). How Conventional Antigens and Superantigens Interact with the Human MHC Class II Molecule HLA-DR1. In, *Dynamics and the Problem of Recognition in Biological Macromolecules*, Eds. O. Jardetzky and J.-F. Lefevre, Plenum Press, 163-172.
- T.S. Jardetzky. (1997). Not just another Fab: Review of the crystal structure of a TcR:MHC:peptide ternary complex. *Structure*, 5, 159-163.
- T.S. Jardetzky. (1997). The interaction of Antigens and Superantigens with the Human Class II Major Histocompatibility Complex Molecule HLA-DR1. In, *Biological NMR Spectroscopy*, Eds. J.L. Markley and S.J. Opella, Oxford University Press, 2 16-234.
- S. Ceman, S. Wu, T.S. Jardetzky and A.J. Sant. (1998). Alteration of a Single Hydrogen Bond between Class II Molecules and Peptide Results in Rapid Degradation of Class II Molecules after Invariant Chain Removal. *J. Exp. Med.*, 188, 2139-2149.
- S.C. Garman, J.P. Kinet and T.S. Jardetzky. (1998). Crystal structure of the human high-affinity IgE receptor. *Cell*, 95, 95 1-961.
- E. Sundberg and T.S. Jardetzky. (1999). Structural basis for the HLA-DQ binding specificity of the Streptococcal superantigen SSA. *Nature Structural Biology* 6, 123- 129.
- K. Baker, R.E. Dutch, R.A. Lamb and T.S. Jardetzky. (1999). Structural basis for paramyxovirus-mediated membrane fusion. *Molecular Cell*, 3, 309-319.
- S.C. Garman, J.P. Kinet and T.S. Jardetzky. (1999). Crystal structure of the human high-affinity IgE receptor (FcER1a). *Ann. Rev. Immunol.*, 17, 973-976.
- S.C. Garman, B.A. Wurzburg, S. S. Tarchevskaya, J.P. Kinet and T.S. Jardetzky (2000) Structure of the human IgE-Fc bound to its high affinity receptor FcER1a *Nature*, 406, 259-266
- B.A. Wurzburg, S.C. Garman and T.S. Jardetzky (2000) Structure of the human IgE-Fc CE3/CE4 domains reveals conformational flexibility of the antibody effector domains. *Immunity*, 13, 375-3 85
- R.E. Dutch, T.S. Jardetzky and R.A. Lamb (2000) Virus membrane fusion proteins: Biological machines that undergo a metamorphosis. *Bioscience Reports*, 20, 597-6 12.
- C.J. Russell, T.S. Jardetzky and R.A. Lamb (2001) Membrane fusion machines of paramyxoviruses: capture of intermediates of fusion, *EMBO J.*, 20, 4024-4034
- S.C. Garman, S. Sechi, J.-P. Kinet, and T.S. Jardetzky (2001) The Analysis of the Human High

- Affinity IgE Receptor FcERI α from Multiple Crystal Forms. *J. Mol. Biol.*, 311, 1049-1062.
- M. Mullen, K.M. Haan, R. Longnecker and T.S. Jardetzky (2002) Crystal Structure of the Epstein Barr Virus gp42 Glycoprotein Bound to HLA-DR1. *Molecular Cell*, 9, 375-385
- B.A. Wurzburg and T.S. Jardetzky (2002) Structural insights into the interactions between human IgE and its high affinity receptor FcERI. *Mol. Immunol.*, 38, 1063-1072

ABSTRACT

Theodore S. Jardetzky was raised in Boston, Massachusetts, and Palo Alto, California, the middle of three brothers. Both of his parents were scientists: his father emigrated from Austria to attend Macalester College, remaining in the United States to receive an MD and PhD from the University of Minnesota, and then working at the California Institute of Technology (with Linus Pauling), Harvard Medical School, Merck and Company, and, finally, Stanford University (as a professor of pharmacology); his mother emigrated from Greece to attend Macalester and then pursued her doctorate at the University of Minnesota. As a child, Jardetzky loved to read and was fascinated by music, wanting to play the trumpet but then settling for the clarinet and, later, the saxophone. He spent much time playing with his siblings and friends made in the community of Stanford faculty. In addition to music, he also had a longtime interest in mathematics and science, and had influential teachers in chemistry and biology in high school.

Unsure of what he wanted to pursue for a career, Jardetzky matriculated at Stanford University in order to explore both science and the humanities. While there, he worked in his father's (Oleg Jardetzky) lab alongside his stepmother, Norma Gene Jardetzky, which proved quite formative: he undertook a senior research project on the structure of the acetylcholine receptor and had the opportunity to meet Kasper Kirschner, with whom Jardetzky decided to work in the Biozentrum at the University of Basel, Switzerland, for his graduate studies. In Kirschner's lab, Jardetzky looked at the kinetics and equilibrium binding of enzyme reactions and had the fortune to meet Donald C. Wiley, who became his postdoctoral advisor. In Wiley's lab at Harvard University Jardetzky researched the structure and mechanism of peptide binding for MHC Class II histocompatibility proteins, after which he accepted a position at Northwestern University looking at the interactions of the immune response, the structure of antibody receptors, and viral pathogenesis.

The interview concludes with reflections on Jardetzky's professional and personal goals; his future research on the structure of membrane proteins, on the properties of protein structure, and on the organization of cellular structures; the importance of the history of science in research; and collaborations and competition in research. At the end of the interview, he talks about setting the national science agenda; the role of the scientist in educating the public; gender issues in science; and the impact of the Pew Scholars Program in the Biomedical Sciences on his work.

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: Jardetzky's Home.

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Persons present during interview: Jardetzky 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 Jardetzky to obtain written background information (curriculum vitae, copies of published articles, etc.) and agree on an interviewing schedule. He also reviewed documentation in Jardetzky's file at the Pew Scholars Program office in San Francisco, including Jardetzky'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.

Jardetzky did not review the transcript. Consequently, some proper names and other information remain unverified.

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

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