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EDUCATION

CORNELL UNIVERSITY, B. A. *Summa cum laude* in Chemistry 1977

Mentor: Prof. Harold A. Scheraga

Thesis: Studies of the α -helical Propensities of Amino Acids in Synthetic Copolymers.

MIT, Department of Biology, Ph.D. 1984

Mentor: Prof. Robert T. Sauer:

Thesis: The Effect of Amino Acid Replacement on the Structure and Stability of the N-terminal Domain of λ -Repressor

POST-DOCTORAL

MIT, Department of Biology 1984–1985

Mentor: Professor Robert T. Sauer

Research: Site-Directed Mutagenesis to Enhance Protein Stability

DUKE UNIVERSITY, Department of Biochemistry 1986–1989

Mentors: Professors David and Jane Richardson

Research: Design of Novel Proteins.

FACULTY POSITIONS

PRINCETON UNIVERSITY - Department of Chemistry	- Assistant Professor	1990–1996
	- Associate Professor	1996–2003
	- Professor	2003–Present
	- Associate Department Chair	2004–2007
	- Director of Undergraduate Studies	2001–Present

HONORS AND AWARDS

- College Scholar, CORNELL UNIVERSITY 1973–1977
- *Summa cum laude* with honors in Chemistry 1977
- National Science Foundation Graduate Fellow 1979–1983
- Life Sciences Research Foundation Burroughs-Wellcome Post-doctoral Fellow 1986–1989
- Beckman Young Investigator Award 1993
- Whitaker Foundation Young Investigator Fellowship 1992
- Protein Society - Kaiser Award 2003
- Science & Technology Steering Committee, Brookhaven National Laboratory 2000–2005
- Editorial Advisory Board – *Protein Science* 2003–
- Editorial Advisory Board – *Protein Engineering, Design & Selection (PEDS)* 2003–
- Editorial Advisory Board – *Biopolymers* 2006–

RESEARCH INTERESTS

- Protein folding and stability
- *De novo* protein design
- Combinatorial methods for constructing protein libraries
- Amyloid, Protein misfolding and aggregation, Alzheimer's disease

MICHAEL H. HECHT, PH.D. – PUBLICATIONS

- Hecht MH, Zweifel BO & Scheraga HA (1978) Helix-Coil Stability Constants for the Naturally Occurring Amino Acids in Water: XVII Threonine Parameters from Poly (hydroxybutyl-glutamine-co-L-threonine). *Macromolecules* 11, 545-551.
- Hecht MH, Nelson HCM & Sauer RT (1983) Mutations in λ -Repressor's Amino-Terminal Domain: Implications for Protein Stability and DNA Binding. *Proc. Natl. Acad. Sci. (USA)* 80, 2676-2680.
- Nelson HCM, Hecht MH & Sauer RT (1983) Mutations Defining the Operator-Binding Sites of Bacteriophage λ Repressor. *Cold Spring Harbor Symp. on Quant. Biology* 47, 441-449.
- Sauer RT, Nelson HCM, Hehir K, Hecht MH, Gimble FS, DeAnda J, & Poteete AR (1983) The λ and P22 Phage Repressors. *J. Biomolec. Struct. and Dynam.* 1, 1011-1022.
- Hecht MH, Sturtevant JM, & Sauer RT (1984) Effect of Single Amino Acid Replacements on the Thermal Stability of the Amino Terminal Domain of Phage λ -Repressor. *Proc. Natl. Acad. Sci. (USA)* 81, 5685-5689.
- Hecht MH & Sauer RT (1985) λ Repressor Revertants: Amino Acid Replacements that Restore Activity to Mutant Proteins. *J. Molec. Bio* 186, 53-63.
- Hecht MH, Hehir K, Nelson HCM, Sturtevant JM & Sauer RT (1985) Increasing and Decreasing Protein Stability: Effects of Revertant Substitutions on the Thermal Denaturation of Phage λ -Repressor. *J. Cell. Biochem.* 29, 217-224.
- Hecht MH, Sturtevant JM & Sauer RT (1986) Stabilization of λ Repressor Against Thermal Denaturation by Site-Directed Gly \rightarrow Ala Changes in α -Helix 3. *Proteins: Structure, Function, and Genetics* 1, 43-46.
- Sauer RT, Nelson HCM, Hecht MH & Pakula A (1987) Identifying the Determinants of Protein Structure and Stability. pp. 177-198 in *New Frontiers in the Study of Gene Function* (G. Poste and S. Crooke, eds.) Plenum Press, New York.
- Hecht MH, Richardson DC, Richardson JS & Ogden R (1989) Design, Expression, and Preliminary Characterization of FELIX: A Model Protein. *J. Cell. Biochem.* (abstract) 13A, 86
- McClain RD, Danials SB, Williams RW, Pardi A, Hecht MH, Richardson JS, Richardson DC & Erickson BW (1990) Protein Engineering of Betabellins 9, 10, and 11. pp. 682-684 in *Peptides: Chemistry, Structure, and Biology* (J. E. Rivier and G. R. Mardhall, eds.) ESCOM Science Publishers, Leiden, The Netherlands.
- Hecht MH, Richardson JS, Richardson DC & Ogden RC (1990) *De Novo* Design, Expression, and Characterization of Felix: A Four-Helix Bundle Protein of Native-Like Sequence. *Science* 249, 884-891.
- Richardson JS, Richardson DC, Tweedy NB, Gernert KM, Quinn TP, Hecht MH, Erickson BW, Yan Y, McClain RD, Donlan ME & Surles MC (1992) Looking at Proteins: Representations, Folding, Packing, and Design. *Biophysical Journal* 63, 1186-1209.
- Brunet AP, Huang ES, Huffine ME, Loeb JE, Weltman RJ & Hecht MH (1993) The Role of Turns in Dictating the Structure of an α -Helical Protein. *Nature* 364, 355-358.
- Kamtekar S, Schiffer JM, Xiong H, Babik JM & Hecht MH (1993) Protein Design by Binary Patterning of Polar and Non-Polar Amino Acids. *Science* 262, 1680-1685.
- Ybe JA & Hecht MH (1994) Periplasmic Fractionation of *Escherichia Coli* Yields Recombinant Plastocyanin Despite the Absence of a Signal Sequence. *Protein Expression and Purification* 5, 317-323.
- Hecht MH (1994) *De Novo* Design of β -Sheet Proteins (Commentary). *Proc. Natl. Acad. Sci. (USA)* 91, 8729-8730.
- Johnson BH & Hecht MH (1994) Recombinant Proteins Can Be Released From *E. Coli* Cells By Repeated Cycles of Freezing and Thawing. *Biotechnology* 12, 1357-1360.

- Xiong H, Buckwalter BL, Shieh HM & Hecht MH (1995) Periodicity of Polar and Non-Polar Amino Acids is the Major Determinant of Secondary Structure in Self-Assembling Oligomeric Peptides. *Proc. Natl. Acad. Sci. (USA)* 92, 6349-6353.
- Qiu D, Dong S, Ybe JA, Hecht MH & Spiro TG (1995) Variations in the Type I Copper Protein Coordination Group: Resonance Raman Spectrum of ^{34}S , ^{65}Cu , and ^{15}N -Labeled Plastocyanin. *J. Am. Chem. Soc.* 117, 6443-6446.
- Kamtekar S & Hecht MH (1995) 4-Helix Bundles: What Determines a Fold? *FASEB Journal* 9, 1013-1022.
- West MW & Hecht MH (1995) Binary Patterning of Polar and Nonpolar Amino Acids in the Sequences and Structures of Native Proteins. *Protein Science* 4, 2032-2039.
- Ybe JA & Hecht MH (1996) Sequence Replacements in the Central β -Turn of Plastocyanin. *Protein Science* 5, 814-824.
- Hecht MH (1996) Strategies for the Design of Novel Proteins. pp. 1-50 in *Protein Engineering and Design* (P. R. Carey - ed.) Academic Press, New York.
- Beasley JR & Hecht MH (1997) Protein Design: The Choice of *De Novo* Sequences. *J. Biol. Chem.* 272, 2031-2034.
- Roy S, Helmer KJ & Hecht MH (1997) Detecting Native-like Properties in Combinatorial Libraries of *De Novo* Proteins. *Folding & Design* 2, 89-92.
- Roy S, Ratnaswamy G, Boice JA, Fairman R, McLendon G & Hecht MH (1997) A Protein Designed by Binary Patterning of Polar and Nonpolar Amino Acids Displays Native-like Properties. *J. Am. Chem. Soc.* 119, 5302-5306.
- Nedwidek MN & Hecht MH (1997) Minimized Protein Structures: A Little Goes a Long Way (Commentary) *Proc. Natl. Acad. Sci. (USA)* 94, 10010-10011.
- Rojas NR, Kamtekar S, Simons CT, McLean JE, Vogel KM, Spiro TG, Farid RS & Hecht MH (1997) De Novo Heme Proteins From Designed Combinatorial Libraries. *Protein Science* 6, 2512-2524.
- Hecht MH, Hindsgaul O, & Kool ET (1998) Biopolymers - Editorial Overview. *Current Opinion in Chemical Biology* 2, 673-674.
- Dong S, Ybe JA, Hecht MH, & Spiro TG (1999) H-Bonding Maintains the Active Site of Type I Copper Proteins: Site-Directed Mutagenesis of Asn38 in Poplar Plastocyanin. *Biochemistry* 38, 3379-3385.
- Rosenbaum DM, Roy S, & Hecht MH (1999) Screening Combinatorial Libraries of De Novo Proteins By Hydrogen-Deuterium Exchange and Electrospray Mass Spectrometry. *J. Am. Chem. Soc.* 121, 9509-9513.
- West MW, Wang W, Patterson J, Mancias JD, Beasley JR & Hecht MH (1999) De Novo Amyloid Proteins From Designed Combinatorial Libraries. *Proc. Natl Acad. Sci.(USA)* 96, 11211-11216.
- Broome BM & Hecht MH (2000) Nature Disfavors Sequences of Alternating Polar and Nonpolar Amino Acids: Implications for Amyloidogenesis. *J. Molecular Biology* 296, 961-968.
- Roy S & Hecht MH (2000) Cooperative Thermal Denaturation of Proteins Designed by Binary Patterning of Polar and Nonpolar Amino Acids. *Biochemistry* 39, 4603-4607.
- Moffet DA, Certain LK, Smith AJ, Kessel AJ, Beckwith KA & Hecht MH (2000) Peroxidase Activity in Heme Proteins Derived From a Designed Combinatorial Library. *J. Am. Chem. Soc.* 122, 7612-7613.
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- Hecht MH, West MW, Patterson J, Mancias JD, Beasley JR, Broome BM & Wang W. (2001) Designed Combinatorial Libraries of Novel Amyloid-like Proteins. Pages 127-138 in *Self-assembling Peptide Systems in Biology, Medicine and Engineering*, (Ed A. Aggeli, N. Boden, S Zhang) Kluwer Academic Publishers, Netherlands.
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- Wang W, & Hecht MH (2002) Rationally Designed Mutations Convert De Novo Amyloid-Like Fibrils into Soluble Monomeric β -Sheet Proteins. *Proc. Natl Acad. Sci.(USA)* 99, 2760-2765.
- Wu Q, Li F, Wang W, Hecht MH, & Spiro TG. (2002) UV Raman Monitoring of Histidine Protonation and H-²H Exchange in Plastocyanin. *J. Inorganic Biochem.* 88, 381-387.
- Wurth C, Guimard NK, & Hecht MH. (2002) Mutations that Reduce Aggregation of the Alzheimer's A β 42 Peptide: An Unbiased Search for the Sequence Determinants of A β Amyloidogenesis. *J. Molec. Biology* 319, 1279-1290
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- Moffet DA, Foley J, & Hecht MH (2003) Midpoint Reduction Potentials and Heme Binding Stoichiometries of *De Novo* Proteins from Designed Combinatorial Libraries. *Biophysical Chemistry* 105, 231-239.
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- Wei Y, Kim S, Fela D, Baum J, & Hecht MH. (2003) Solution Structure of a *De Novo* Protein from a Designed Combinatorial Library. *Proc. Natl Acad. Sci.(USA)* 100, 13270-13273.
- Wei Y & Hecht MH. (2004) Enzyme-like Proteins from an Unselected Library of Designed Amino Acid Sequences. *Protein Engineering, Design & Selection (PEDS)* 17, 67-75.
- Hecht MH, Das A, Go A, Bradley LH, Wei Y (2004) *De Novo* Proteins from Designed Combinatorial Libraries (Invited Review Article) *Protein Science* 13, 1711-1723.
- Klepeis JL, Wei Y, Hecht MH & Floudas CA (2005) Ab initio Prediction of the Three-Dimensional Structure of a *De novo* Designed Protein: A Double Blind Case Study. *Proteins: Structure, Function and Bioinformatics* 58, 560-570.
- Bradley LH, Kleiner RE, Wang AF, Hecht MH & Wood DW (2005) An Intein-Based Genetic Selection Enables Construction of a High-Quality Library of Binary Patterned *De Novo* Sequences. *Protein Engineering, Design & Selection (PEDS)* 18, 201-207.
- Hu Y, Das A, Hecht MH & Scoles G (2005) Nanografting *De Novo* Proteins onto Gold Surfaces. *Langmuir* 21, 9103-9109.
- Kim W, & Hecht MH (2005) Mutagenesis of the Carboxy-Terminal Residues of the Alzheimer's Peptide: Sequence Determinants of Enhanced Amyloidogenicity of A β 42 Relative to A β 40. *J. Biological Chemistry* 280, 35069-35076.
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- Bradley LH, Wei Y, Thumfort P, Wurth C, Hecht MH. (2006) Protein Design by Binary Patterning of Polar and Nonpolar Amino Acids. Chapter 9 in *Protein Engineering Protocols in Methods in Molecular Biology* (Humana Press) 352, 155-166.
- Das A, Trammell SA & Hecht MH (2006) Electrochemical and Ligand Binding Studies of a De Novo Heme Protein. *Biophysical Chemistry* 123, 102-112.
- Kim W, Kim Y, Min J, Kim DJ, Chang Y-T & Hecht MH (2006) A High Throughput Screen for Compounds that Inhibit Aggregation of the Alzheimer's Peptide. *ACS Chemical Biology* 1, 461-469.
- Kim W, Hecht MH (2006) Generic Hydrophobic Residues are Sufficient to Promote Aggregation of the Alzheimer's A β 42 Peptide. *Proc. Natl Acad. Sci.(USA)* 103, 15824-15829.
- Das A, Hecht MH (2007) Peroxidase Activity of *De Novo* Heme Proteins Immobilized on Electrodes. *J. Inorganic Biochemistry* 101, 1820-1826.
- Go A, Kim S, Hecht MH, & Baum J. (2007) NMR Assignments of S836; a De Novo Protein From a Designed Superfamily. *Biomolecular NMR Assignments* 1, 213-215.
- Kim W, Hecht MH (2008) Mutations Enhance the Aggregation Propensity of the Alzheimer's A β Peptide *J. Molec. Biology*. 377 565-574. (doi:10.1016/j.jmb.2007.12.079)
- Go A, Kim S, & Baum J. & Hecht MH, (2008) Structure and Dynamics of *De novo* Proteins from a Designed Superfamily of 4-Helix Bundles *Protein Science*. vol 17, No 4.