Kevin Karplus
Professor
Biomolecular Engineering
University of California, Santa Cruz

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EMPLOYMENT HISTORY

2004–present	Professor, Biomolecular Engineering, University of California, Santa Cruz
2000–2004	Professor, Computer Engineering, University of California, Santa Cruz
1993–2000	Associate Professor, Computer Engineering, University of California, Santa Cruz
1986–93	Assistant Professor, Computer Engineering, University of California, Santa Cruz.
1982–86	Assistant Professor of Computer Science and Electrical Engineering, Cornell University, Ithaca, NY
Summer 1979	Instructor (Computer Science), Stanford University, Stanford, CA
Summer 1981	Member of Technical Staff, Bell Labs, Murray Hill, NJ
Summer 1974	Summer Student Intern, Argonne National Laboratory, Argonne, IL

Consulting

May 2001	LEK consulting
Aug 2000	Neomorphic
June 1999	Foley & Lardner, New York, NY
October 1992	Fish & Neave, Palo Alto, CA
Dec. 1986–Dec. 1990	Space Systems, Loral (was Ford Aerospace), Palo Alto, CA
1985–1990?	Teltech, Minneapolis, MN
July 1983–1993	Eloquent Technology, Ithaca, NY
March 1985	Xcite, Inc., Los Angeles, CA
January–June 1983	Mattel Electronics, Hawthorne, CA
June 1978–July 1980	Corn Country Whole Foods, Champaign, IL

EDUCATION

Ph.D. 1983	Stanford University, Computer Science
M. S. 1976	Stanford University, Mathematics
B. S. 1974	Michigan State University, Mathematics

HONORS AND AWARDS

2004	Excellence in Teaching Award, UCSC.
2002	Honorable Mention, Excellence in Teaching, UCSC.
1978–82	Fannie and John Hertz Foundation Fellowship
1974–77	National Science Foundation Fellowship
1974	Undergraduate honor societies: ΦBK (general), $\Phi K\Phi$ (general), $\pi\mu\epsilon$ (math)

RESEARCH GRANTS AND AWARDS

2003–2008 "Combined methods for protein-structure prediction" with Richard Hughey, 5 years starting July 2003, $1,081,700. NIH R01 GM068570.

1999–03 "The UCSC Kestrel Server: Remote Parallel Processing and Computational Biology," with Richard Hughey, co-PI, $1,200,000 over four years, NSF. $122,000 REU Supplement requested.

1999–02	"HMM-Based Gene Annotation Methods," with David Haussler, PI, and Richard Hughey, co-PI, $525,000 over three years, DOE.
1999–01	"Training Program in Biomolecular Engineering," with David Haussler, PI, and 6 other co-PIs, $269,142 over two years, UC Biotechnology Research and Education.
1999–00	UCSC Committee on Research, "Experimental validation of computer-predicted putative gene from M. jannaschii," 1 year starting July 1999, $2,000, with Tony Fink.
1998–01	"Protein Classification Using Hidden Markov Models," with David Haussler, PI, and Richard Hughey, co-PI, $545,000 + $35,000 REU supplement over three years, NSF.
1995–98	Department of Energy, "Generalized Hidden Markov Models for Genomic Sequence Analysis," 3 years starting Aug 1, 1995, $100,000 per year, with Richard Hughey and David Haussler.
1995–99	NSF Grant MIP-9423985 "Multi-Purpose Parallel Processor for Biosequence Analysis," $489,595, with Richard Hughey (includes REU supplement).
1995	Los Alamos Cooperative Research Grants (LACOR), "Covariation of Mutations: a Computational Approach for Determination of Function and Structure from Sequence," 1 year starting Sept 1, 1995, $30,000, with Richard Hughey and David Haussler.
1994–96	Los Alamos–UC Campus Collaborative Research (LACOR) Project, "Computational Approaches for Determination of Function and Structure ¿From Sequence," with David Haussler, Richard Hughey, and Alan Lapedes (LANL). $27,000 per year for two years.
1993–96	University of California, Santa Cruz, Seed Money Grant, $13,000, "Nucleotide Sequence Analysis in VLSI," with Richard Hughey.
1992	SIGDA DA-library award (CD-ROM valued at ≈$1000).
1991–92	NSF Grant CDA-9022505 *CISE Research Instrumentation* ($110,387).
1991	NSF Grant MIP-9014762 *1991 Advanced Research in VLSI Conference* ($12,000).
1989–91	NSF Grant MIP-8903555 *Using If-Then-Else DAGs for Multi-level Logic Minimization* ($158,309) 1989–1991 Additional *Research Experience for Undergraduates* Supplement 1990 $7,968. Additional *Software Capitalization* Supplement 1991 $23,935.
1989	Committee on Research, Seed Funds, *Application of Silicon Technology to Scientific Imaging* ($10,000).
	Ford Aerospace and Communications: *Systolic Decoder Chip* ($26,326 + 7,857 = 34,183).
1986–2000	NSF-funded use of MOSIS chip brokerage for classes (approx $4000/year).
1985–87	NSF Grant DCR-85-3262: *Clocking Disciplines and Mutual Exclusion Constraints: Formal Models and Verification Tools* ($104,901).
1984–86	IBM Faculty Development Award ($50,000).

Main Research Interests

Protein structure prediction using neural nets, hidden Markov models, mutual information, and fragment packing. Protein sequence analysis. Computational protein design.

Research Summary

Prof. Karplus has been doing research in bioinformatics since 1995 and teaching it since Fall 1998. His main research has been in protein structure prediction, including several different subfields: using hidden Markov models (HMMs) to find remote homologs, predicting local structure, using local structure to improve search and alignment of templates, new local structure alphabets, residue-residue contact prediction, optimization programs to build full 3D models from templates or fragments, and model quality assessment.

Prof. Karplus's team has participated in the biennial community-wide assessment of structure prediction (CASP) and has done well in it every time (CASP2 in 1996 through CASP8 in 2008).

In the future, in addition to protein structure prediction, Prof. Karplus plans to work on protein design and on analyzing data from next-generation DNA sequencing platforms.