CURRICULUM VITAE

NECMETTIN YILDIRIM
Department of Mathematics
University of North Carolina at Chapel Hill
CB # 3250, Chapel Hill, NC 27599-3205

Phone : (919) 843-2550 (work)
: (919) 929-1957 (home)
Fax : (919) 962-9345
Email : yildirim@amath.unc.edu
URL : www.amath.unc.edu/Faculty/yildirim/

RESEARCH INTERESTS

- Nonlinear dynamical systems, Time delay differential equations, Symbolic computation and Computer Algebra, Mathematical biology, Enzyme kinetics.

EDUCATION

- **SEP 1996- APRIL 2000**
  PhD in Applied Mathematics, Ataturk University, Erzurum, Turkey.
  Dissertation: Kinetic and metabolic control analysis of multi enzymes systems in biochemistry by combination of symbolic and numerical computation techniques.
  Supervisor: Prof. Mustafa Bayram
- **SEP 1993- JAN 1996**
  MSc in Applied Mathematics, Dumlupinar University, Kutahya, Turkey.
  Thesis: Dimension reduction by principle components analysis in multivariate data analysis and an application.
  Supervisor: Prof. Ibrahim Guney
- **SEP 1987- JUNE 1992**
  BSc in Mathematics Education, Middle East Technical University, Ankara, Turkey.

PROFESSIONAL EXPERIENCES

- **FEB 2003- PRESENT**
  Postdoctoral Fellow in Department of Mathematics, University of North Carolina at Chapel Hill, Chapel Hill, NC (With Prof. Timothy C Elston).
- **AUGUST 2001- NOV 2002**
  Postdoctoral Fellow in The Center for Nonlinear Dynamics in Physiology and Medicine, McGill University, Montreal, QC, Canada (With Prof. Michael C Mackey).
- **1998 JAN - AUGUST 2001**
  Research Assistant in Computer Sciences Application and Research Center
  Ataturk University, Erzurum, Turkey.
- **SEPT 1992-JAN 1998**
  Mathematics Instructor at Aziziye and Yavuz Selim Colleges in Turkey.

TEACHING EXPERINCES

- I taught several math courses including Algebra, Calculus and Trigonometry and Analytic Geometry at college level between 1992-1998.
- Fall 2003, Calculus of functions of one variable, Full course responsibility.
- Fall 2004, Linear algebra and its applications, Full course responsibility.

JOURNAL PUBLICATIONS

1. Symbolic computation in kinetics of biochemical networks (In preparation to submit **International Journal of Quantum Chemistry**), Joint work with Elston T.C.
2. Computational and experimental analysis of feedback regulation of MAP kinase in yeast(In preparation), Joint work with Elston T.C. and Dohlman, H.G and Hao, N.
3. Yildirim, N., Santillan, M., Horike, D., and Mackey, M. C. (2004) Dynamics and bistability in a reduced model of the lac operon, **Chaos**, 14(2), 279-292.
4. Mackey, M.C., Santillan, M. and Yildirim, N. (2004) Modeling operon dynamics: The tryptophan and lactose operons as paradigms, **Comptes Rendus Biologies**, 327(3), 211-

224.

5. Subasi, M., Yildirim, N. and Yildiz, B. (2004) An improvement on Fibonacci search method in optimization theory, **Applied Mathematics and Computation**, 147(3), 893-901.

6. Hao, N., Yildirim, N., Wang, Y.Q., Elston, T.C. and Dohlman, H.G.(2003) Regulators of G protein signaling and transient activation of signaling: Experimental and computation analysis reveals negative and positive feedback controls on G protein activity, **Journal of Biological Chemistry**, 278(47), 46506-46515.

7. Yildirim, N. and Mackey, M.C.(2003) Feedback regulation in the lactose operon: A mathematical modeling study and comparison with experimental data, **Biophysical Journal**, 84(5), 2841-2851.

8. Yildirim, N., Akcay, F., Okur, H. and Yildirim, D. (2003) Parameter estimation of nonlinear models in biochemistry: A comparative study on optimization methods, **Applied Mathematics and Computation**, 140(1), 29-36.

9. Yildirim, N., Ankaralioglu, N., Yildirim, D. and Akcay, F. (2003) Application of Grobner basis theory to derive rate equations for enzyme catalyzed reactions with two or more substrates or products, **Applied Mathematics and Computation**, 137(1), 67-76.

10. Yildirim, N. (2002) Quasi-steady state kinetics of simple sequential multienzyme reactions with single substrates, **Journal of Mathematical Chemistry**, 32(3), 271-280.

11. Yildirim, N., Ciftci, M. and Kufrevioglu, O.I. (2002) Kinetic analyses of multi enzyme systems: A case study of creatine kinase- hexokinase and glucose 6-phosphate dehydrogenase, **Journal of Mathematical Chemistry**, 31(1), 121-130.

12. Bayram, M., Simsek, H. and Yildirim, N. (2002) Automatic calculation of Alexander polynomials of (3,k)-torus knots, **Applied Mathematics and Computation**, 136(2-3), 505-510.

13. Yildirim, N. and Bayram, M. (2000) Derivation of conservation relationships for metabolic networks using Maple, **Applied Mathematics and Computation**, 112(2-3), 255-263.

14. Yildirim, N. and Bayram, M. (2000) Analysis of the kinetics of unstable enzymatic systems using Maple, **Applied Mathematics and Computation**, 112(1), 41-48.

BOOK CHAPTER

1. Yildirim, N., Hao, N., Dohlman, H.G. and Elston, T.C. (2004) Mathematical Modeling of RGS and G Protein Regulation in Yeast, In **Methods Enzymology**, v.389, 383-398, Academic Press, New York.

INVITED TALKS

1. Yildirim, N. (2004) Some uses of computer algebra in enzyme kinetics, **228th American Chemical Society National Meeting**, August 22-26, Philadelphia, PA, USA.

PRESENTATIONS

1. Yildirim, N., Yetiskin, H. and Bayram, M. (2001) Automatic derivation of conservation relationships for metabolic pathways: A Maple Program, **Mathematical Modeling and Scientific Computing: An international Conference**, April 2-6, Ankara-Konya, TURKEY.

2. Yildirim, N., Bayram, M., Ciftci, M. and Kufrevioglu, O.I. (2000) Sembolik ve nümerik metotlarla cok enzimli bagli sistemlerin kinetiklerinin incelenmesi, **Ulusal Kimya Kongresi**, 10-15 Eylül, Dicle Universitesi, Diyarbakir, TURKEY.

3. Yildirim, N. and Bayram, M. (2000) Symbolic and numeric computations in kinetic analysis of multi enzyme systems in biochemistry, **2nd World Conference On Mathematics and Computers in Physics**, Vouliagmeni, July 10-15, Greece.

POSTERS

1. Yildirim, N., Hao, N., Dohlman, H.G. and Elston, T.C. (2004) Mathematical Modeling of G-Protein Signaling Pathway in Yeast, **Gordon Research Conference** (Theoretical Biology and Biomathematics Conference), June 4-11, Tilton school, NH, USA.

2. Yildirim, N., Horike, D. and Mackey, M.C. (2002) Regulation of Lactose Operon: A Mathematical modeling study, **MITACS Third Annual General Meeting**, May 23-25,

University of British Columbia, Vancouver, CANADA.

3. Yildirim, N., Mackey, M.C. (2002) Dynamics and bistability in the lactose operon: A mathematical modeling and comparison with experimental data, **First SIAM Conference on Life Sciences**, April 11-13, Boston, MA, USA.

4. Yildirim, N.(2001) Application of Grobner bases theory to derive steady state rate equations in biochemical kinetic theory, **Maple Application Center** (online at `http://adept.maplesoft.com/`)**.**

AWARDS AND HONORS

- Postdoctoral fellowship from The Scientific and Technical Research Council of Turkey under the NATO fellowship program ($9800).
- Research award of $1000 from The Scientific and Technical Research Council of Turkey. This award is given for publishing paper in refereed international journals.
- Student-Employee Fellowship from The Scientific and Technical Research Council of Turkey, 1988 -1989.
- Honor degree during undergraduate study.

LANGUAGES

- Turkish (native)
- English

COMPUTER SKILLS

- **OPERATING SYSTEMS/LANGUAGES**
  Unix, Dos, Windows, Fortran, Maple, Basic and Matlab.
- **OTHERS**
  LaTeX, Microsoft Office and other Windows applications.

REFERENCES

Prof. Michael C. Mackey
Centre for Nonlinear Dynamics in Physiology and Medicine
McGill University, Canada
Email : `mackey@cnd.mcgill.ca`

Prof. Timothy C. Elston
Department of Mathematics
University of North Carolina at Chapel Hill
Email : `telston@amath.unc.edu`

Prof. Henrik G. Dohlman
Department of Biochemistry and Biophysics
University of North Carolina at Chapel Hill
Email : `henrik_dohlman@med.unc.edu`

Prof. Sue Goodman
Department of Mathematics
University of North Carolina at Chapel Hill
Email : `seg@email.unc.edu`