Michael L. Blinov

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Highlights

- Development of algorithms and software tools for modeling and analysis of biomolecular interactions.
- Modeling of signal-transduction systems (EGF receptor system and FcεRI receptor system).
- Extensive database, Perl and web programming experience.
- Extensive research experience with ODE and dynamical systems. Extensive math background.
- Teaching experience at the graduate level.
- Project management skills (coordinator of several programming and educational projects).

Employment

- **2003-present** Post Doctoral Research Associate, Theoretical Biology Group, LANL, USA
- **2001-2003** Graduate Research Assistant, Theoretical Biology Group, LANL, USA
- **1999-2001** Co-founder and programming team leader of NetGliding.com, Israel

Education

- **Ph.D. , 2003** The Weizmann Institute of Science, Math./Comp. Sci. (Y. Yomdin) GPA: 96.87/100.00
- **M.Sc., 1997** The Weizmann Institute of Science, Math./Comp. Sci. (Y. Yomdin) GPA: 95.44/100
- **B.Sc., 1995** The Moscow State University, Mathematics , GPA: 5/5

Peer-reviewed publications

1. **M.L. Blinov**, J. Yang, J.R. Faeder & W.S. Hlavacek (**in press**) "Graph Theory for Rule-based Modeling of Biochemical Networks", *Lect. Notes Comp. Scie. Trans. Syst. Biol.*
2. **M.L. Blinov**, J.R. Faeder, J. Yang, B. Goldstein & W.S. Hlavacek (**in press**) 'On-the-fly' or 'generate-first' modeling? Correspondence *Nat. Biotech.*
3. **M.L. Blinov**, J.R. Faeder, B. Goldstein & W.S. Hlavacek (**2005**) "A network model of early events in epidermal growth factor receptor signaling that accounts for combinatorial complexity." *BioSystems* doi:10.1016/j.biosystems.2005.06.014
4. J.R. Faeder, **M.L. Blinov** & W.S. Hlavacek (**2005**) "Graphical rule-based representation of signal-transduction networks." *Proc. ACM Symp. Appl. Computing*, 133-140.
5. J.R. Faeder*, **M.L. Blinov***, B. Goldstein & W.S. Hlavacek (**2005**) "Rule-based modeling of biochemical networks." *Complexity* **10**, 22-4
   * These two authors contributed equally.
6. J.R. Faeder, **M.L. Blinov**, B. Goldstein & W.S. Hlavacek (**2005**) "Combinatorial complexity and dynamical restriction of network flows in signal transduction.", *IEE Systems Biology* **2**, 5-15
7. **M. Blinov**, M.Briskin, Y. Yomdin. **(2005) "**Local Center Conditions for Abel Equation and cyclicity of

it Zero Solution", Contemporary Mathematics, **382**: 65-82.

8. **M. L. Blinov**, J. R. Faeder, B. Goldstein, W. S. Hlavacek. (**2004**) "BioNetGen: software for rule-based modeling of signal transduction based on the interactions of molecular domains", *Bioinformatics* **20**: 3289-91
9. W. S. Hlavacek, J. R. Faeder, **M. L. Blinov**, A. S. Perelson, B. Goldstein. **(2003)** "The Complexity of Complexes in Signal Transduction", *Biotechnol. Bioeng.* **84:** 783-794**.**
10. **M. Blinov**, N. Roytvarf, Y. Yomdin. **(2003)** "Center and Moment Conditions for Rational Abel Equations", *Func. Differ. Equ.* **10:** 95-106.
11. J. R. Faeder, W. S. Hlavacek, I. Reischl, **M. L. Blinov**, H. Metzger, A. Redondo, C. Wofsy, and B. Goldstein. **(2003)** "Investigation of early events in FceRI-mediated signaling using a detailed mathematical model." *J. Immunol.* **170:** 3769-81
12. **M. Blinov**, N. Zehavi, S. Black. **(2003)** "Computer motivated study of Problems in Number Theory", *The International Journal of Computer Algebra in Mathematics Education* **9**: 315-330
13. B. Goldstein, J. R. Faeder, W. S. Hlavacek, **M. L. Blinov**, A. Redondo, and C. Wofsy. **(2002)** "Modeling the early signaling events mediated by aggregation of FceRI", *Mol Immunol.* **38:** 1213-1219
14. **M. Blinov**, Y. Yomdin. **(2001)** "Center and Composition Conditions for Abel Differential Equation, and rational curves" , *Qualitative Theory of Dynamical Systems* **2:** 111-127
15. **M. Blinov**, Y. Yomdin. **(1999)** "Generalized center conditions and multiplicities for polynomial Abel equations of small degrees", *Nonlinearity* **12:** 1013-1028.

Patents

- **Blinov M.**, Faeder J., Hlavacek W., Software and procedures for creating mathematical/computational models of cellular signaling. US Patent Application 20050042663 (2005), available at http://uspto.gov
- Patent application in preparation.

Proposals

- **M.L. Blinov,** J.R. Faeder, B. Goldstein, A. Finney & W.S. Hlavacek (**2004**) "Rule-based modeling of multi-component species." A proposal for SBML Level 3. Available at http://sbml.org/wiki/SBML_Level_3_Efforts

Reviewer for

- Bioinformatics
- Biosystems

Talks at international meetings

- **"Graph Theory for Rule-based Modeling of Biochemical Networks"**, *BioConcur 2005 Workshop at CONCUR2005 international meeting*, San Francisco, CA, August 27th, 2005.
- "**BIONETGEN: current state and further development**", *The 3rd International Symposium on Computational Cell Biology*, Lenox, MA, March 19-23, 2005.
- **"Rule-based modeling of multi-component species."** *9th SBML Forum*, Heidelberg, Germany, October 14-15, 2004
- **"Modeling and analysis of signal transduction without ignoring combinatorial complexity."** *4th*

International Conference of Systems Biology, Heidelberg, Germany, October 8-13, 2004

- **"Modeling and analysis of combinatorial complexity in signal transduction**", *Understanding Complex Systems Symposium,* Urbana-Champaign, IL, May 17-20, 2004
- **"Center and moment conditions for rational Abel equations on a closed curve"**, *Conference on "Bifurcations de systèmes différentiels, applications à la biologie",* Marseille, France, December 16-20, 2002
- **"Abel Differential Equation on Rational Curves"** , *Summer School on Dynamics Systems*, CIME, Cetraro, Italy, June 18-26, 2000
- **"Center and Composition Conditions for Abel Differential Equation, and Rational Curves" ,** *Conference on "Geometrie des equations differentielles",* Marseiile, France, October 3-10, 1999

Selected Poster Abstracts

- **M. L. Blinov,** J. R. Faeder, B. Goldstein, W. S. Hlavacek. "BIONETGEN: a modeling tool that handles combinatorial complexity", Mathematical Models in Signaling Systems, Nashville, TN, June 16-18, 2004
- **M. L. Blinov**, J. R. Faeder, B. Goldstein, W. S. Hlavacek. "Modeling and analysis of combinatorial complexity in signal transduction", International Conference on Complex Systems (ICCS2004), Boston, MA, May 19-21, 2004
- W. S. Hlavacek, **M. L. Blinov**, M. A. Savageau, M. E. Wall. "The EcoTFs Database: Escherichia Coli Transcription Factors and Signals", RECOMB 2004, San Diego, CA, March 27-31, 2004
- **M. L. Blinov**, J. R. Faeder, W. S. Hlavacek, B. Goldstein. "Network model for early events in EGFR signaling that accounts for hundreds of protein complexes and phosphoforms", *Proceedings of the 4th International Conference on Systems Biology*, St Louis, USA, November 5-9, 2003, p. 89-90
- J. R. Faeder, **M. L. Blinov**, W. S. Hlavacek, B. Goldstein. "Networks that govern Complex Formation during Signal Transduction Exibit Narrow Flows", *Proceedings of the 4th International Conference on Systems Biology*, St Louis, USA, November 5-9, 2003, p. 115-116
- **M. L. Blinov**, J. R. Faeder, W. S. Hlavacek,. "Combinatorial complexity in immunoreceptor signaling", *Proceedings of the 3rd International Conference on Systems Biology*, Stockholm, Sweden, December 10-15, 2002, p. 58
- **M. L. Blinov**, W. S. Hlavacek, J. R. Faeder, B. Goldstein. "Database of Models for Ligand-Receptor Binding in XML-based formats", *Proceedings of the 2nd International Conference on Systems Biology*, Pasadena, USA, November 4-7, 2001, p. 125
- J. R. Faeder, W. S. Hlavacek, A. Redondo, C. Wofsy, **M. L. Blinov**, and Byron Goldstein. "A detailed kinetic model of immuno-receptor signaling", *Proceedings of the 2nd International Conference on Systems Biology*, Pasadena, USA, November 4-7, 2001, p. 17
- **M. L. Blinov**, W. S. Hlavacek, J. R. Faeder, B. Goldstein. "Analysis of Cell-Signaling Networks: Which Reactions in the Network are Important?" *Bridging the Canyon: Biology at LANL",* Santa Fe, NM, September 12-13, 2001

Visiting scientist

- **2004, October-November** Weizmann Institute of Sciences, Israel

Awards

- "BioNetGen" software nominated by Los Alamos National Lab for 2004 R&D 100 competition.
- Student Distinguished Performance Award at Los Alamos Natl Lab, 2003
- Graduate Fellowships of the Weizmann Institute of Sciences, 1995-2001
- The National Academy of Sciences (US) Travel Grant, 1999

- International Science Foundation Grant #MQO000, Independent Moscow University, 1994-1995
- International Science Foundation Student Grant for distinguished successes in studies, Moscow State University, 1994-1995

Computer Skills

- Web programming: Perl, PHP, SQL, Apache/Linux. Administrator of http://cellsignaling.lanl.gov and http://ecotfs.lanl.gov web-portals. See personal website for more projects.
- Programming languages: Perl, JAVA, C (basic), FORTRAN (basic), Basic (basic)
- Math programming: Mathematica, MatLab, Maple, Derive

Teaching Experience

- **2003 Lecturer** at the Summer School on Neural Networks, Santa Fe Institute.
- **1998-2000** Lecturer for the graduate course "Mathematical Modeling in Biology" (Prof. Lee Segel)
- **1998** Teaching assistant for the graduate course "Computer Algebra Systems" (Prof. N. Zehavi).
- **1997-1998.** Mentor for Summer Science Institute. Supervised 2 pre-university students working on scientific projects.

Project management Skills

- **Programming team leader, 2000-2001.** Supervised staff of 2 programmers. Duties included software and hardware purchases, projects description and negotiations with customers.
- **Math Coordinator for Summer Science Institute, 1999-2000.** Supervised staff of 6 mentors (hiring and training mentors, interviewing students, preparation of reports, presentations, checking results and considering all the claims).

Additional Skills

- **Languages:** English (fluent), Russian (native), Hebrew (good), some German
- Image processing, algebraic geometry, numerical methods, cryptography, low dimensional topology.
- Yachting (Royal Yacht Association Day Skipper course), rafting, catamaran sailing

References

- B. Goldstein, Laboratory Fellow, Theor. Biol., Los Alamos National Lab, bxg@lanl.gov
- W. S. Hlavacek, Staff Scientist, Theor. Biol., Los Alamos National Lab, wish@lanl.gov
- Y. Yomdin, Prof., Theor. Math, Weizmann Institute of Science, yomdin@wisdom.weizmann.ac.il
- J. R. Faeder, Staff Scientist, Theor. Biol., Los Alamos National Lab, faeder@lanl.gov
- J.-P. Francoise, Prof., Theor. Math , Univ. Paris 6, jpf@ccr.jussieu.fr