

UNIVERSITY OF PENNSYLVANIA - SCHOOL OF MEDICINE
Curriculum Vitae

September 2009

HARVEY RUBIN

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School of Medicine
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Education:
1969 B.S. State University of New York, Stony Brook
1974 Ph.D. University of Pennsylvania
1976 M.D. Columbia University College of Physicians and Surgeons

Postgraduate Training and Fellowship Appointments:
1969-72 University Fellowship, Department of Physics University of Pennsylvania,
Philadelphia, PA.
1972-76 Medical Scientist Training Program, Columbia University, College of Physicians
and Surgeons, New York, NY.
1976-77 Medical House Officer, Peter Bent Brigham Hospital, Boston, MA.
1977-78 Assistant Resident Physician, Peter Bent Brigham Hospital, Boston, MA.
1976-78 Clinical Fellow in Medicine, Harvard Medical School, Boston, MA.
1978-80 Research Fellow in Medicine, Harvard Medical School, Boston, MA.
1980-81 Research Fellow in Medicine, Harvard Medical School, Postdoctoral Fellow,
Sidney Farber Cancer Institute, Boston, MA.
1981-83 Research Fellow, Division of Tropical Medicine, Harvard Medical School,
Boston, MA.

Military Service: none
Clearance: top secret

Faculty Appointments:
1969-70 Instructor in Physics, University of Pennsylvania
1981-83 Instructor in Medicine, Harvard Medical School
1983-92 Assistant Professor of Medicine, Department of Medicine, University of
Pennsylvania School of Medicine
1992 Associate Professor of Medicine, Department of Medicine, University of
Pennsylvania School of Medicine
1995-- Tenure--University of Pennsylvania

1998-- Professor of Medicine, University of Pennsylvania
2000—2001 Associate Dean for Research, Veterans Affairs, University of Pennsylvania
2000—2001 ACOS Research Philadelphia Veterans Medical Center
2001—2004 Associate Dean for Student Affairs, University of Pennsylvania,
School of Medicine
2002—present—Director, Institute for Strategic Threat Analysis and Response (ISTAR)

Secondary Faculty Appointments:

Professor of Microbiology, University of Pennsylvania, School of Medicine
Professor of Biochemistry, University of Pennsylvania, School of Medicine
Professor of Computer and Information Sciences, University of Pennsylvania, School of
Engineering and Applied Science

Hospital and Administrative Appointments:

1981-82 Junior Associate in Medicine, Peter Bent Brigham Hospital
1982-83 Associate Physician, Peter Bent Brigham Hospital
1982-83 Clinical Associate, Sidney Farber Cancer Institute
1983-present Attending Physician, Hospital of the University of Pennsylvania, Philadelphia,
PA.
1985-1995 Director, The Traveler's Medical Service, Hospital of the University of
Pennsylvania

Licensure and Certification:

1979 American Board of Internal Medicine
1980 Massachusetts License Board Reg. 45295
1983 Pennsylvania License Board MD-030491-E

Awards and Honors:

1976 Sandoz Award for Excellence in Research, Columbia University, College of
Physicians and Surgeons
1983 Measey Foundation Fellowship for Faculty Development, University of
Pennsylvania, School of Medicine
1985 Young Investigator Award, National Foundation of Infectious Diseases
1996 Donald B Martin, MD Teaching Service Award, Department of Medicine,
Hospital of the University of Pennsylvania
2002 First Professor S. Ramaseshan Lecturer in Frontiers in Interdisciplinary Sciences,
Indian Institute of Information Technology.
2005 Sigma Xi Invited Speaker, Saint Joseph's University, Induction Ceremony

Visiting Scientist:

1985 Kuvim Center for Infectious and Tropical Diseases, Hebrew University, Hadassah
Medical School, Jerusalem, Israel

Reviewer:

Annals of Internal Medicine
Biochemistry
Journal of Biological Chemistry
Journal of Immunology

Nature Structural Biology
Biophysical Journal
Journal of Molecular Biology
Microbiology (Basel)
Biochemica Biophysica Acta

Research Funding (Principal Investigator):
Current Funding (Principal and co- Investigator):

1. Characterization of NADH Type II Oxidoreductase from Mycobacterium Tuberculosis PI NIH, R01AI068942 7/2007-6/2012
2. Development of new anti TB agents: Global Alliance for TB Drug Development 2007—2010
3. “Program and Curriculum on Issues Arising from the War in Iraq” National Security Agency, 898230-09-P-2054: 2008-2009.
4. “Development of new antibiotics against *Mycobacterium tuberculosis* based on the oxidative phosphorylation system” co-PI with Prof. Jeffrey Winkler, Department of Chemistry (Univ. of Pennsylvania) Institute for the Translational Medicine and Therapeutics (ITMAT), University of Pennsylvania, 2009-2010.
5. John Hopkins University (sub to NIH PI. Dr. Petros Karakousis) R01Regulatory Networks Involved in Mycobacterium Tuberculosis Persistence, 7/1/2009 -6/30/2014

Research Funding (Past 10 yrs)

1. Cyber-Physical Systems-co-PI with Dr. Vijay Kumar, University of Pennsylvania School of Engineering. NSF 7/2007-7/2008
2. Cellular Inspired Garbage Collection: Ubiquitin system and memory management. Co-PI with Dr. Daniel Lee, Univ. of Penn. School of Engineering NSF, 9/1/04-8/31/07.
3. Biodefense for the Federal Workforce PI NSF 5/2007.
4. Fundamental research on agents of bioterrorism. Benjamin Franklin Technology Development Authority 2004-2006.
5. Integrated Curriculum in Bioterrorism. Health Resources and Services Administration (HRSA) 10/05-9/06.
6. Modeling, Analysis, Simulation and Synthesis of Biomolecular Networks DARPA/ITO 6/01-12/05.
7. Regulation of Dormancy in *M. tuberculosis* NIH RO1-AI43420 5/1/99-4/30/05
8. Serine Proteases and Mechanisms of Inflammation, NIH, RO1 HL50523 1999 --2004
9. Modeling and Manufacture of Huge DNA Oligonucleotide Libraries for Computation NSF 9/1/01-8/31/04.
10. Interaction of Antichymotrypsin with Serine Proteases, NIH, AG10599, 1996--2001, Co-PI with Dr. Barry Cooperman, Department of Chemistry, Univ. of Pennsylvania.
11. DNA-Based Computers, (co-PI) Subaccount 2 98-SC-NSF-1007, 1997-2000.
12. Executing Genetic Algorithms Using DNA Genetic Material NSF 8/99-7/02
13. Inhibition of Human Chymase by Serpins, NIH AR42931, 1993-1997, Co-PI with Dr. Norman Schechter, Division of Dermatology, HUP. Renewed 1997-2002.
14. Modeling and Analysis of Biological and Information Networks NSF 10/01—4/03
15. Serine Proteases and Mechanisms of Inflammation, (PI) NIH, RO1 HL50523 1994--1999.

16. Ribonucleotide Reductase: Regulation of Malarial Growth, (PI) NIH, RO1 AI39165, 1996-1999.
17. Biochemistry, Molecular Biology and Cellular Biology of Serine Protease Inhibitors, (PI) Supergen Pharmaceuticals, 1987—2000.

Academic Committees at the University of Pennsylvania:

1984-	Board of Advisors- Office of International Programs
1985-1992	Quality Assurance Committee, Hospital of the University of Pennsylvania
1985-1991	Coordinator for the Infectious Diseases Fellowship Program
1985-present	Internship Selection Committee
1986-1991	Human Subjects Committee, Wistar Institute
1990	Committee on Conflict of Interests, University of Pennsylvania School of Medicine
1991-1995	Medical Faculty Senate Steering Committee
1992-1993	Chair-Elect, Medical Faculty Senate
1992-1993	University Judiciary Hearing Board
1993-1994	Chair, Medical Faculty Senate
1993-1994	Chair, University Committee on Academic Strengths
1993-1995	University Committee on Committees
& 1997-1998	
1994-1995	Provost's Council on Undergraduate Education
1994-1999	University Senate Executive Committee
1994-1996	University Senate Steering Committee
& 1998-1999	
1995	University Committee to Review the Dean of the School of Medicine
1996	Search Committee Physician in Chief and Chair of Pediatrics, CHOP
1997--1999	Committee on Academic Freedom and Responsibility
1997--1999	University Senate Committee on the Faculty
1997--1999	Advisory Committee for the Office of Postdoctoral Programs
1998-1999	Chair, University Senate Committee on the Faculty
1999 -present	Advisory Board, University of Pennsylvania Center for Judaic Studies
1999-2000	Chair, Review Committee Department of Biochemistry
1999-2000	Co-Chair Committee on the Tenure Track, Faculty 2000
2000-present	Penn Hillel Committee
2000-2002	Annenberg Center, Faculty Advisory Committee
2000-	Faculty 2000 Implementation Committee
2000-2001	Department of Medicine Committee on Patient Oriented Research
2000-2001	Department of Medicine Committee on Appointments and Promotions
2000-2004	School of Medicine Committee on Appointments and Promotions
2001—2004	Chair, School of Medicine Committee on Appointments and Promotions
2001—2003	Committee on the Curriculum, School of Medicine
2002-2003	University of Pennsylvania, Nominating Committee
2004—	School of Medicine Committee on Underrepresented Minorities in Medicine
2004—2005	University Provost Search Committee
2006—2007	Chair, Committee to Review the Department of Dermatology
2006	School of Medicine Committee on Appointments and Promotions
2007	Search committee member for Chair of Computer Science, School of Engineering, University of Pennsylvania

2008 Chair-elect University Faculty Senate
2009 Chair University Faculty Senate

Organizations:

University of Pennsylvania John Morgan Society
Interurban Clinical Club

Advisory Board

Faculty Advisory Board SEI Center for Advanced Studies in Management—Wharton School of Business, University of Pennsylvania

State Committees

2003—2004 Member of the Pennsylvania Commission on Crime and Delinquency
Chair –Subcommittee on information access and sharing

City Committees

2005-2007 Co-Chair--City of Philadelphia Emergency Preparedness Review Committee
2006-present. Co-chair City of Philadelphia Emergency Preparedness Implementation Team

Federal Committees

2005—present National Science Advisory Board for Biosecurity (NSABB)
subcommittee member on international issues
subcommittee member on synthetic biology
November 2006 Member Science Community conference--FBI/National Security Higher Education Advisory Board (NSHEAB).
2008—present NAS/DOD Biological Cooperative Threat Reduction Program
2008—present NSF Steering Committee on Cyberphysical Systems

International Committees

June 2008—present, working group on antibiotic resistance, Center for Global Development
November 2008—present World Economic Forum Council on Pandemics

Consultant

2006-2008 Office of the Assistant Secretary of DHS for Infrastructure Protection via International Assessment and Strategy Center.

Major Teaching and Clinical Responsibilities for the University of Pennsylvania (over the past five years):

1. Attending Rounds at HUP 2-3 months/year
2. Infectious Diseases Clinic one afternoon/week
3. Course lectures in Pharmacology, Mechanisms of Infection, Biochemistry
4. Medical Management Conferences--HUP House Staff throughout the year
5. Physical Diagnosis 2nd year medical students
6. Advisor for the first year students in the medical school
7. Grand Rounds at HUP and the VA Hospital
8. Supervision of undergraduate, graduate and postdoctoral students
9. Course Director: Wilderness Medicine
10. Faculty Councilor AOA 2003-2005.

11. Spring 2006 semester School of Arts and Sciences course: Homeland Security
12. Faculty advisor for One Health, a Medical, Veterinary, Nursing, Wharton and Graduate student group 2009—present
13. Faculty advisor for Wilderness Medicine Student Interest Group Penn Med 2009--present

Chairman of Scientific Sessions at International Conferences: (since 2000)

1. 3rd International Symposium on the Structure and Biology of Serpins, Chicago, IL. June 2-5, 2002.
2. Models of Thought Processes, Insights Toward Chemical Systems, NSF Workshop, Arlington Va. June 2004.
3. High Confidence Medical Systems and Software, NSF Workshop, Philadelphia, PA. June 2005, session chair.
4. Economic Impact of Pandemic Influenza, Milken Institute Global Conference, Los Angeles CA. April 2006, session moderator
- 5.. Gordon Conference on TB Drug Development, Chair-Respiratory Chain session, Oxford, England, August 2007
- 6.. International Center for the Study of Radicalization and Political Violence, Chair Summary Session, London England, January 2008

Conference Organizer: (since 2000)

1. 6th International Conference on DNA-Based Computing, University of Leiden, The Netherlands, June 12-17, 2000.
2. Program Committee: Fifth International Workshop: Hybrid Systems: Computation and Control, Stanford University, Stanford CA, March 25-27, 2002.
3. 3rd International Symposium on the Structure and Biology of Serpins, Chicago, Il. June 2002.
4. NSF Conference on Advanced Computation Inspired by Biology. NSF, Alexandria, VA, April 6-8, 2003. Conference Organizer and Chair. *Nov 10, 2006*.
5. Roundtable on Enhancing Interdependent Global Supply Chain Effectiveness. Wharton School, University of Pennsylvania, November 10, 2006
6. “Advanced Robotics: Research to Enhance Preparedness and Response” University of Pennsylvania, School of Engineering. November 10, 2006.
7. “Biodefense for the National Workforce” National Science Foundation/National Security Agency Workshop. Baltimore, MD. May 2007.

Advisory Boards:

1. 1999 Franklin Institute Committee on Science and Technology Awards ad hoc member
2. 2001-2003 Franklin Institute Committee on Science and The Arts.
3. Board of Directors, International Center for the Study of Radicalisation and Political Terrorism

Patents

<u>PAT. NO.</u>	<u>Title</u>
5,834,279	Methods of identifying compounds that inhibit DNA synthesis in mycobacterium tuberculosis and compositions, reagents and kits for performing the same
5,827,662	Methods for detecting genetic mutations resulting in protease inhibitor insufficiencies

5,723,316.	alpha.-1-antichymotrypsin analogues having chymase inhibiting activity
5,674,708	alpha.-1-antichymotrypsin analogues having elastase inhibitory activity
5,637,479	Method of modulating DNA binding activity of recombinant .alpha.-1 antichymotrypsin and other serine protease inhibitors
5,612,194	Methods of producing effective recombinant serine protease inhibitors and uses of these inhibitors
5,459,063	Plasmodium falciparum ribonucleotide reductase DNA
5,367,064.	alpha.-1-antichymotrypsin, analogues and methods of production
5,266,465.	alpha.-1-antichymotrypsin, analogues and methods of production
5,252,725.	alpha.-1-antichymotrypsin, analogues and methods of production
5,079,336	.alpha.-1-antichymotrypsin, analogues and methods of production
4,880,512	Pulsed light selective photolysis process for treatment of biological media and products made thereby

Invited Speaker (since 2000)

1. March 2000 “Mechanism of Action of Serine Protease Inhibitors. MCP-Hahnemann University, Philadelphia, PA.
2. April 2000 “Biomolecular Computation” delivered in the Frontiers in Computing Symposium, University of Pennsylvania, Philadelphia PA.
3. May 2000 “New Approaches to Vaccines for Tuberculosis” and “Interpretations of the PPD and Clinical Decision Making” American College Health Assoc. Annual Meeting, Toronto, Canada.
4. June 2000 “Biomolecular Computing” DARPA Workshop, Chantilly Virginia.
5. October 2000 “The Clinical and Economic Impact of Malaria” Malaria at the Millennium Seminar Series, University of Pennsylvania.
6. May 2001 “Dormancy in Tuberculosis” Department of Biochemistry, Temple University, Phila. PA.
7. June 2001 “The Stringent Response in *M. tuberculosis*” Gordon Conference on TB Drug Development, New London, New Hampshire.
8. July 2001 “What Makes Biological Systems Hybrid Systems?” Society for Industrial and Applied Mathematics Annual Meeting, San Diego CA.
9. July 2001 “Molecular Mechanisms of Dormancy in Mtb.” Univ. of Calif. At San Diego, San Diego CA.
10. January 2002 “Specific Enzyme Systems in MTb as Targets for Drug Development” International Symposium on Current Developments in Drug Discovery for Tuberculosis, Bangalore, India.
11. January 2002 “Biologically Inspired Computation and Molecular Modeling of Complex Biological Systems” First Professor S. Ramaseshan Lecture in Frontiers in Interdisciplinary Sciences. Indian Institute of Information Technology, Bangalore, India.
12. January 2002 “Enzyme Networks in TB Dormancy and Growth Cycles” Rockefeller University, New York.
13. July 2002 “Enzymes in Involved in Dormancy in Tuberculosis” Enzymes in Deoxyribonucleotide Synthesis Symposium, Stockholm, Sweden.
14. July 2002 “Enzymes in Involved in Dormancy in Tuberculosis” South African MRC, University of the Witwatersrand, Johannesburg, South Africa.
15. February 2003 “Regulatory Enzymes in *M. tuberculosis*” Keystone Meeting, Taos, New Mexico.
16. April 2003 “Interdependent Security of Complex Networks” The Marshall Institute.

- Washington DC.
17. July 2003 “Systems Biology for *M. tuberculosis*” Indian Institute of Science, Bangalore, India
 18. July 2003 “Drug Development for “*M. tuberculosis*” Astra Zeneca India, Bangalore, India.
 19. August 2003 “Interdependent Security: SARS” The Wharton School of Business, Philadelphia PA.
 20. March 2004 “Biological Systems are Natural Hybrid Systems” Invited Speaker, Hybrid Systems : Computation and Control (HSCC), Philadelphia PA.
 21. April 2004 “Sensors for CBN warfare” Science Coalition, US Congress, Washington DC.
 22. June 2004 “How Bacteria Think—Sensing and Responding in Bacterial Systems”. NSF Workshop, Arlington Va.
 23. July 2004 “The Molecular Basis of the Stringent Response in *Mycobacterium tuberculosis*” NIH, Bethesda MD.
 24. Nov. 2004 “The Molecular Basis of Dormancy in *Mycobacterium tuberculosis*” GlaxoSmithKline, Phila. PA.
 25. Nov. 2004 “The Psychology of Terrorists and Counterterrorism” U.S. Psychiatric and Mental Health Congress. San Diego CA.
 26. Nov. 2004 “Information Technology and Biopreparedness” Eclipsis Users Conference, San Diego CA.
 27. Nov. 2004 High Confidence Medical Device Software and Systems (HCMDSS) Workshop Planning Meeting, Arlington VA.
 28. June 2005 “NADH Oxidoreductase as a Drug Target in TB”, Gordon Conference on TB Drug Development, New England University, Biddeford Maine.
 29. June 2005 “Bacterial Sensing Systems” delivered at the MITRE conference on the Significance of Bioinformatics to National Security
 30. July 2005 “National Science Advisory Board for Biosecurity and the Role of Intuitional Biosafety Committees”, National Meeting of the Campus Safety, Health & Environmental Management Association, Philadelphia, Pa.
 31. July 2005 “Threats and Security in Latin America” Pan American Association, Union League, Philadelphia, Pa.
 32. July 2005 “Pneumonia in the elderly” Issues in Aging Conference: New Orleans.
 33. July 2005 “New Targets for TB Drug Development” Gordon Conference, Maine.
 34. October 2005 “Grand Rounds, Update on Tuberculosis” Temple University Medical Center, Philadelphia PA.
 35. October 2005 “New Targets for TB Drug Development” World Union on Lung Disease, Paris, France.
 36. December 2005 “Preparedness Planning” Pennsylvania Chamber of Business and Industry, Harrisburg PA.
 37. January 2006 “Issues in Dual Use Research” MITRE Corp. Virginia.
 38. February 2006 “Molecular Mechanisms in TB Vaccine Development” Merck Pharmaceuticals, Philadelphia.
 39. July 2006 “The New Arms Race: Making the Case for an International Treaty for Infectious Diseases” The Department of State, Washington DC.
 40. September 2006 “The Macroeconomic Impact of Pandemic Influenza”. College of Physicians. Philadelphia, PA.
 41. October 2006 Plenary Lecture, Annual Meeting Infectious Disease Society of America. “The New Arms Race: Making the Case for an International Compact for Infectious

- Diseases” Toronto, Canada.
42. October 2006 Keynote Address NSF Cyber-Physical Systems Workshop, “The Cyber-Bio Interface” Austin, Texas.
 43. October 2006 “Urban Preparedness and Response”, Real Estate Roundtable Philadelphia PA.
 44. November 2006 Keynote Address, “Dual Use Life Science Research: Is Any Research Just Too Dangerous?” 75th Anniversary meeting of the International Council for Scientific Unions and the Student Pugwash Organization. National Academy of Sciences, Washington, DC.
 45. November 2006 “Pandemic Flu Planning” National Financial Services Roundtable National Press Club in Washington, DC.
 46. December 2006 “The New Arms Race: Making the Case for an International Compact for Infectious Diseases” First Annual World Congress, Alliance for the Prudent Use of Antibiotics. Boston MA.
 47. January 2007 Keynote Address NSF Cyber-Trust Program. “The Cyber-Trust Biology Interface” Atlanta, Georgia.
 48. January 2007 “Leadership and Urban Preparedness” Fels School of Government Leadership Series. Philadelphia, PA.
 49. February 2007 “Making the Case for an International Compact for Infectious Diseases” Woodrow Wilson School of Public and International Affairs, Princeton University. Princeton NJ.
 50. February 2007 “A Molecular and Mathematical Model of Persistence in Bacteria” Johns Hopkins University, Baltimore MD.
 51. February 2007 “Addressing Biosecurity Concerns Raised by Synthetic Biology” International Roundtable on Dual Use Life Sciences Research. National Institutes of Health, National Science Advisory Board for Biosecurity, World Health Organization. Bethesda, MD.
 52. March 2007 “On An International Compact for Infectious Diseases” Carnegie Endowment for International Peace, Washington DC.
 53. May 2007 “Making the Case for an International Compact for Infectious Diseases” Organization for Economic Cooperation and Development (OECD), Paris, France.
 54. May 2007 “Review of the Findings of the City of Philadelphia Emergency Preparedness Review Committee”. Greater Philadelphia Chamber of Commerce Annual Meeting. Philadelphia, PA.
 55. May 2007 “The International Compact for Infectious Diseases”. Dinner speaker annual Meeting, Federation of American Scientists and the Carnegie Foundation for International Peace. Lombardy Hotel, Washington DC.
 56. June 2007 “The International Compact for Infectious Diseases” OECD High Level Forum on "Medicines for Neglected and Emerging Infectious Diseases" – Noordwijk an Zee, The Netherlands.
 57. October 2007 “Biologically Inspired Cyber-Physical Systems” IEEE International Conference on Systems, Man and Cybernetics. Montreal, Canada.
 58. October 2007 “Global Biosecurity--Strategies to Operationalize New Ideas and Initiatives” Partnership for Global Security, Landau Network Centro Volta, Como, Italy.
 59. December 2007 “Molecular Mechanisms of Dormancy in Tuberculosis”. MD/PhD Symposium Speaker, Columbia University, College of Physicians and Surgeons, New York.
 60. April 2008 “Communicable Diseases: A Clear and Present Crisis on a Global Scale”. Keynote Address, Penn/Wharton First Annual Conference-Workshop on Business and the Environment. Philadelphia PA.
 61. April 2008 “The Apparent Dualism of Alternative Standards of Medical Care in the Event of Catastrophic Incidents”. Potomac Institute for Policy Studies, Washington DC.

62. May 2008 “Public Health Responses to Low Probability, High Consequence Events”. Terrorism and Global Security RAND Corporation, Santa Monica CA.
63. May 2008 Testimony before the United Kingdom House of Lords Committee on communicable diseases.
64. June 2008 “Towards an International Compact for Infectious Diseases”. BIO International, San Diego, CA
65. November 2008 “Women and Medical Issues”. Women in Construction Conference, Washington DC
66. November 2008 “A Global Response to Communicable Diseases”. OECD, Paris, France.
67. February 2009 “Preparing for Global Communicable Diseases Disasters” Netherlands Vaccine Institute, Utrecht, the Netherlands.
68. May 2009 “Bench to Bedside to Bush,: Putting Basic Advances in tuberculosis immunology and microbiology into clinical practice—the bug’s perspective” American Thoracic Society San Diego CA.
69. July 2009 “If Bankers were Bacteria--we may not be in this financial mess” World Economic Forum, NY, NY.

Peer Review Study Section:

- 1990-- Naval Medical Research and Development Command Basic Research Review Panel
- 1991-- Ad hoc reviewer for the World Health Organization, Malaria Section
- 1992--present Ad hoc reviewer for the Human Frontier of Science Program
- 1992-1994-VA Merit Review Board for Infectious Diseases
- 1996-- Ad hoc reviewer for NSF
- 1997-- NIH Special Emphasis Panel on Emerging Infectious Diseases: Bacteriology and Mycology
- 1998-- NIH Special Study Section on Antiparasitic Agents.
- 1999-- NIH Special Study Section for the Selection of a Tuberculosis Research Unit
- 1999-- Review Panel for the Establishment of a New MRC Research Unit. The Medical Research Council, South Africa
- 1999-- NIH Ad Hoc GMA1.
- 2000-- NIH Ad Hoc Pathobiochemistry Study Section
- 2000—NASA Intelligent Systems Program
- 2001—NIH Study Section Response to the Presidential Vaccine Initiative—Overcoming the Tuberculosis Latency Challenge
- 2001—NIH Ad hoc Hematology –2 Study Section
- 2005—NIH NIAID Chair Special Emphasis Panel-TB Structural Biology
- 2006, 2007—National Research Council reviewer for the Interim Report on Methodological Improvements to the Department of Homeland Security's Biological Agent Risk Analysis Committee on Methodological Improvements to the Department of Homeland Security's Biological Agent Risk Analysis.
- 2008—NSF (CISE directorate) Blue Ribbon review Panel for Expeditions in Computing (Expeditions) program

Editor:

1. DNA Based Computers III. DIMACS Series in Discrete Mathematics and Theoretical Computer Science vol 48. Amer. Mathematical Soc. 1999. Ed. Harvey Rubin and David Wood.

2. BioSystems vol. 52 October 1999. Proceedings of the Fourth International Meeting on DNA Based Computers. Guest Editors: Lila Kari, Harvey Rubin, David Wood

Book Chapters

DNA Replication. Mizrahi V., Andersen S. and Rubin H. In *Molecular Genetics of Mycobacteria*. ASM Press 2000.

Nucleic acid metabolism. Mizrahi, V. Buckstein, M., Rubin, H. In: *Tuberculosis* (2nd Edition). Ed. Cole ST, McMurray D, Gicquel B and Jacobs WR Jr), , ASM Press 2004.

Type II NADH:Menaquinone Oxidoreductase of *Mycobacterium tuberculosis*. Teh, J.S., Yano, T., Rubin, H. in *Infectious Disorders-Drug Targets*, pp 169-181, 2007. Bentham Science Publishers.

Electron transport and respiration in mycobacteria. Bavesh D. Kana, Edith E. Machowski, Norman Schechter, Jiah-Shin Teh, Harvey Rubin² & Valerie Mizrahi in *Mycobacterium: Genomics and Molecular Biology*, Eds. T. Parish & A. Brown, Horizon Press, 2009

Teh, JS., Rubin, H. Global Diseases: The Role of Networks in the Spread and Prevention of Infection. in *The Network Challenge: Strategy, Profit and Risk in an Interlinked World*. Eds. Kleindorfer, PR, and Wind, Y., Gunther, RE. Wharton School Publishing, Philadelphia 2009.

Teh, JS, Rubin, H., Dealing with Pandemics: Global Security, Risk Analysis, and Science Policy Chapter 13 *Learning From Catastrophes* (in press) Eds. Kunreuther, H., Useem, M., Glasser, J., and Hall, R.

Book Reviews

1. "The Touchstone of Life" by W.R. Lowenstein. *Annals of Internal Medicine* 1999 July 131: 79.

2. "William Osler: A Life in Medicine" by Michael Bliss. *Annals of Internal Medicine* 2000 Sep 133:488.

3. "Physician's Guide to Terrorist Attack" Roy, M.J. (ed) *Annals of Internal Medicine* 2004, March 140:496.

Government Reports

1. A Potential Influenza Pandemic: Possible Macroeconomic Effects and Policy Issues. Congressional Budget Office December 2005

2. City of Philadelphia Emergency Preparedness Review June 2006 found at www.Phila.gov/ready.

3. City of Philadelphia Emergency Preparedness Review—90 Progress Report September 2006 found at www.Phila.gov/ready.

4. National Research Council: Countering Biological Threats: Challenges for the Department of Defense's Nonproliferation Program Beyond the Former Soviet Union Committee on Prevention of Proliferation of Biological Weapons in States Beyond the Former Soviet Union; Office for Central Europe and Asia; National Research Council.

ISBN: 0-309-13177-4, 214 pages, <http://www.nap.edu/catalog/12596.html>

Comments, Analysis

1. Tort, Contract, and the Patient-Physician Relationship *Annals of Internal Medicine* Volume 109, 929-930, 1988.
2. Medicine for a sickly world. *The New Scientist* 197, 14, 2008.
3. University of Pennsylvania, Graduation Address 2009 “The Moral Responsibility to be Intelligent” reprinted in the *University of Pennsylvania Almanac* May 26, 2009, Vol. 55, No. 34
4. Why bankers are like bacteria *The New Scientist* 203, 24-25, 2009
5. “Origins” *University of Pennsylvania Almanac* September 8, 2009, Volume 56, No. 02

Bibliography:

1. Rubin, H., and Kallenbach, N.R., Conformational Statistics of Short RNA Chains. *J. Chem. Phys.*, 62, 2766-2776, 1975.
2. Benesch, R.E., and Rubin, H., Interaction of Hemoglobin With Three Ligands: Organic Phosphates and the Bohr Effect. *Proc. Nat'l. Acad. Sci. (USA)*, 72, 2465-2467, 1975.
3. Spangler, G.J., Griffin, J. D., Rubin, H., and Livingston, D. M., Identification and Initial Characterization of a New Low Molecular Weight Virus Encoded T Antigen in a Line of Simian Virus 40 Transformed Cells. *J. Virol.* 36, 488-498, 1980.
4. Rubin, H., Figge, J., Bladon, M. T., Chen, L., Ellman, M., Bikel, I., Farrell, M., and Livingston, D. M., Role of Small t Antigen in the Acute Transforming Activity of SV40. *Cell* 30, 469-480, 1982.
5. Taraschi, T., Parasher, A., Hooks, M., and Rubin, H., Erythrocyte Membrane Alterations Induced by Infection with *P. falciparum*. *Science* 232, 102-104, 1986.
6. Rubin, H., and Lynn, L., *Cryptococcus*--a Review. *Infectious Disease Newsletter* 9, 1-8, 1986.
7. Axelrod, P., Kwon-Chung, K. J., Frawley, P., and Rubin, H., Chronic Cystitis Due To *Cokeromyces Recurvatus*: A Case Report. *J. Infec. Dis.* 155, 1062-1064, 1987.
8. Watson, B., Blitzer, M., Rubin, H., and Nachamkin, I., Direct Wet Mounts vs. Concentration for Routine Parasitologic Examination: Are Both Necessary? *Am. J. Clin. Path.* 89, 389-391, 1988.
9. Rubin, H., Biomedical Research as Practical Philosophy. *Les Nouvelles* 25, 44-46, 1990.
10. Schechter, N. M., Sprows, J. L., Schoenberger, O. L., Lazarus, G. S., Cooperman, B. S., and Rubin, H., Reaction of Human Skin Chymotrypsin-like Protease Chymase With Plasma Proteinase Inhibitors. *J. Biol. Chem.* 264, 21308-21315, 1989.
11. Schoenberger, O. L., Sprows, J. L., Schechter, N. M., Cooperman, B. S., and Rubin, H., Limited Proteolysis of C1-Inhibitor by Chymotrypsin-like Proteinases. *FEBS Letters* 259, 165-167, 1989.

12. Rubin, H., Wang, Z., Nickbarg, E. B., McLarney, S., Naidoo, N., Schoenberger, O. L., Johnson, J., and Cooperman, B. S., Cloning, Expression and Biological Activity of Native and Site-Directed Altered Human Alpha 1 Antichymotrypsin. *J. Biol. Chem.* 265, 1199-1207, 1990.
13. Yang, Fu-De, Spanevello, R. A., Celiker, I., Hirschmann, R., Rubin, H., and Cooperman, B. S., The Carboxyl Terminus Heptapeptide of The R2 Subunit of Mammalian Ribonucleotide Reductase Inhibits Enzyme Activity and Can Be Used To Purify The R1 Subunit. *FEBS Letters*, 271, 61-64, 1990.
14. Kilpatrick, L., Johnson, J. L., Nickbarg, E., B., Wang, Z., Clifford, T. F., Banach, M., Cooperman, B. S., and Rubin, H. Inhibition of Human Neutrophil Superoxide Generation By Alpha-1 Antichymotrypsin. *J. Immunol.* 146, 2388-2393, 1991.
15. Ziegler, E. J., and the HA-1A Sepsis Study Group Treatment of Gram-Negative Bacteremia and Septic Shock With HA-1A Human Monoclonal Antibody Against Endotoxin. *N. Engl. J. Med.* 324, 429-436, 1991.
16. Schuster, M.G., Enriquez, P.M., Curran, P., Cooperman, B.S. and Rubin, H. Regulation of Neutrophil Superoxide By Antichymotrypsin/Chymotrypsin Complexes. *J. Biol. Chem.* 267, 5056-5059, 1992.
17. Schulman, K.A., Glick, H.A., Rubin, H. and Eisenberg, J.M. Cost Effectiveness of HA-1A Monoclonal Antibody for Gram Negative Sepsis: Prospective Economic Assessment of a New Therapeutic Agent. *J. Am. Med. Assoc.* 266, 3466-3471, 1991.
18. Wei, A., Rubin, H., Cooperman, B.S., Schechter, N. and Christianson, D.W. Crystallization, Activity Assay and Preliminary X-ray Diffraction Analysis of the Uncleaved Form of the Serpin Antichymotrypsin. *J. Mol. Biol.* 226, 273-276, 1992.
19. Rubin, H. The Biology and Biochemistry of Antichymotrypsin and Its Potential Role as a Therapeutic Agent. *Biol. Chem. Hoppe-Seyler* 373, 497-502, 1992.
20. Rubin, H. The Design and Development of Protease Inhibitors as Therapeutic Agents. *Proceedings of the 1992 International Congress on Proteolysis* 183-196.
21. Salem, J.S., Scott, C.P., Li, L-S, Cooperman, B.S and Rubin, H. High Level Expression of the Large Subunit of Mouse Ribonucleotide Reductase in a Baculovirus System. *FEBS Lett.* 323, 93-95, 1993.
22. Cooperman, B.S., Stavridi, E., Nickbarg, E., Rescorla, E., Schechter, N.M. and Rubin, H. Antichymotrypsin Interaction with Chymotrypsin: Partitioning of the Complex. *J. Biol. Chem.* 268, 23616-23625, 1993.
23. Schechter, N.M., Jordan, L.M., James, A.M., Cooperman, B.S., Wang, Z.M. and Rubin, H. Reaction of Human Chymase with Reactive Site Variants of alpha1-Antichymotrypsin. *J. Biol. Chem.* 268, 23626-23633, 1993.

24. Rubin, H., Salem, J.S., Li, L-S., Yang, F-D., Mama, S., Wang, Z-M., Fisher, A., Hamann, C.S. & Cooperman, B.S. Cloning, Sequence Determination and Regulation of the Ribonucleotide Reductase Subunits from *P. falciparum*: A Target for Antimalarial Therapy. Proc. Nat. Acad. Sci. 90, 9280-9284, 1993.
25. Fisher, A., Yang, F-D., Rubin, H. & Cooperman, B.S. R2 C-Terminal Peptide Inhibition of Mammalian and Yeast Ribonucleotide Reductase. J. Med. Chem. 36, 3859-3862, 1993.
26. Katz, D.S., Wei, A., Zhong, Q., Rubin, H., Cooperman, B.S. & Christianson, D.W. Crystalization and Atomic Resolution X-ray Diffraction Analysis of Antichymotrypsin Variants. Biochem. Biophys. Res. Comm. 196, 752-757, 1993.
27. Schechter, N.M., Wang, Z.M., Blacher, R.W., Lessin, S.R., Lazarus, G.S. and Rubin H. Determination of the Primary Structures of Human Chymase and Cathepsin G from Cutaneous Mast Cells. J. Immunol. 152, 4062-4069, 1994.
28. Wei, A., Rubin, H., Cooperman, B.S., Christianson, D.W. Crystal Structure of an Uncleaved Serpin Reveals the Conformation of an Inhibitory Reactive Loop. Nature, Structural Biology, 1, 251-258, 1994.
29. Rubin, H., Plotnick, M., Wang, Z.M., Liu, X., Schechter, N.M., Zhong, Q. and Cooperman, B.S. Conversion of Alpha 1 Antichymotrypsin into a Human Neutrophil Elastase Inhibitor: Demonstration of Variants with Different Association Rate Constants, Stoichiometries of Inhibition and Complex Stabilities. Biochemistry 33, 7627-7633, 1994.
30. Hendriksen, M.A., Cooperman, B.S., Salem, J.S., Li, L-S., and Rubin, H. The Stable Tyrosyl Radical in Mouse Ribonucleotide Reductase Is Not Essential for Enzymatic Activity. J. Amer. Chem. Soc., 116, 9773-9774, 1994.
31. Yang, F., Lu, G. and Rubin, H. Isolation of Ribonucleotide Reductase from *Mycobacterium tuberculosis* and Cloning, Expression and Purification of the Large Subunit. J. Bacteriol., 176, 6738-6743, 1994.
32. Naidoo, N., Cooperman, BS., Wang, Z-M., Liu, X-Z., and Rubin, H. Identification of Lysines Within α 1-antichymotrypsin Important for DNA Binding: An Unusual Combination of DNA Binding Elements. J. Biol. Chem. 270, 14548-14555, 1995.
33. Sims, R., Hauser, R.J., Adewale, A.O., Maislin, G., Skeie, S., Lavizzo-Mourey, R.J. and Rubin, H. Acute Putatively Infectious Gastroenteritis in Three Community-based Nursing Homes. J. Gerontol. Series A, 50, 252-256, 1995.
34. Lomas, DA., Stone, SR., Llewelyn-Jones, C., Koegan, M-T., Wang, Z-M., Rubin, H., Carrell, RW. and Stockley, RA. The Control of Neutrophil Chemotaxis by Inhibitors of Cathepsin G and Chymotrypsin. J. Biol. Chem. 270, 23437-23443, 1995.
35. Wang, Z-M., Rubin, H. and Schechter, NM. Expression, Folding and Activation of Recombinant Human Chymase: Demonstration That The Natural Pro-peptide Sequence Is Not Required. Biol. Chem. Hoppe-Seyler. 376, 681-684, 1995.

36. Yang, F., Lu, G. and Rubin, H. Cloning Expression, Purification and Characterization of DNA Topoisomerase I of *Mycobacterium tuberculosis*. Gene. 178, 63-69, 1996.
37. Plotnick, M.I., Mayne, L., Schechter, N.M., & Rubin, H. Distortion of the Active Site of Chymotrypsin Complexed with a Serpin. Biochemistry. 35, 7586-7590, 1996.
38. Rubin, H. Serine Protease Inhibitors (SERPINS): Where Mechanism Meets Medicine. News and Views, Nature Medicine, June 6, 1996.
39. Stavridi, E.S., O'Malley, K., Lukacs, C.M., Moore, W.T., Lambris, J., Christianson, D.W., Rubin, H. & Cooperman, B.S. Structural Change in Chymotrypsin Induced by Complexation with α 1-Antichymotrypsin as Seen by Enhanced Sensitivity to Proteolysis. Biochemistry, 35, 10608-10615, 1996 .
40. Rubin, H. DNA Computation: The Search for the Killer App. Nature Structural Biology. 3, 656-658, 1996.
41. Lukacs, C.M., Zhong, J.Q., Plotnick, M., Rubin, H., Cooperman, B.S. & Christianson, D.W. Arginine Substitutions in the Hinge Region of Antichymotrypsin Affect Serpin α -sheet Rearrangement. Nature Structural Biology 3, 888-893, 1996.
42. Leete, T. & Rubin, H. Malaria and the Cell Cycle--a New Twist. Parasitology Today 12, 442-444, 1996.
43. O'Malley, K.M., Nair, S.A., Rubin, H., & Cooperman, B.S. The kinetic mechanism of serpin :proteinase complex formation: an intermediate between the Michaelis complex and the inhibited complex. J. Biol. Chem. 272, 5354-5359, 1997.
44. Ware, J.H., Wan, X.S., Rubin, H., Schechter, N.M. & Kennedy, A.R. Soybean Bowman-Birk Protease Inhibitor is a Highly Effective Inhibitor of Human Mast Cell Chymase. Archives of Biochemistry and Biophysics. 344, 133-138 1997.
45. Schechter, N.M., Plotnick, M., Selwood, T., Walter, M. & Rubin, H. Diverse Effects of pH on the Inhibition of Human Chymase by Serpins. J. Biol. Chem. 272 24499-24507, 1997.
46. Yang, F., Curran, S.C., Li, L-S., Avarbock, D., Graf, J.D., Chua, M-M., Lu, G., Salem, J. & Rubin, H. Characterization of Two Genes Encoding the *Mycobacterium tuberculosis* Ribonucleotide Reductase Small Subunit. J. Bacteriol. 179, 6408-6415, 1997.
47. Plotnick, M., Schechter, N.M., Wang, Z-M., Liu, X. & Rubin, H. The Role of the P6-P3' Region of the Serpin Reactive Loop in the Formation and Breakdown of the Inhibitory Complex. Biochemistry. 36, 14601-14608, 1997.
48. Carney, D.F., Jagels, M.A., Hugli, T.E., Sands, H. & Rubin, H. Effect of Serine Protease Inhibitors on Neutrophil Function: α 1-Proteinase Inhibitor, Antichymotrypsin, and a Recombinant Hybrid Mutant of Antichymotrypsin (Lex 032) Modulate Neutrophil Adhesion Interactions. J. Leuk. Biol. 63, 75-82, 1998.

49. Lukacs, C.M., Rubin, H., Christianson, D.W. Engineering an anion-binding cavity in antichymotrypsin modulates the "spring-loaded" serpin-protease interaction. *Biochemistry* 37, 3297-3304, 1998.
50. Wang, Z.M., Walter, M., Selwood, T., Rubin, H., & Schechter, N.M. Recombinant Expression of Human Mast Cell Proteases Chymase and Trypsin. *Biol. Chem. Hoppe-Seyler* 379, 167-174, 1998.
51. Guittet, O., Ducastel, B., Salem, J.S., Henry, Y., Rubin, H., Lemaire, G., & Lepoivre, M. Differential Sensitivity of the Tyrosyl Radical of Mouse Ribonucleotide Reductase to Nitric Oxide and Peroxynitrite. *J. Biol. Chem.* 273, 22136-22144, 1998.
52. Janciauskiene, S., Rubin, H., Lukacs, C.M., & Wright, H.T. Evidence for Bimodal Insertion of the Amino and Carboxyl Segments of Alzheimer's Peptide A β ₁₋₄₂ into β -Sheets of β 1-Antichymotrypsin. *J Biol Chem.* 273, 28360-28364, 1998.
53. Liu, A., Pötsch, S., Davydov, A., Barra, A-L., Rubin, H., & Gräslund, A. The Tyrosyl Free Radical of Recombinant Ribonucleotide Reductase from *Mycobacterium tuberculosis* is Located in a Rigid Hydrophobic Pocket. *Biochemistry.* 37, 16369-16377, 1998.
54. Elleingand E, Gerez C, Un S, Knupling M, Lu G, Salem J, Rubin H, Sauge-Merle S, Laulhere JP, & Fontecave M. Reactivity studies of the tyrosyl radical in ribonucleotide reductase from *Mycobacterium tuberculosis* and *Arabidopsis thaliana*--comparison with *Escherichia coli* and mouse. *Eur J Biochem.* 258, 485-490, 1998.
55. Pereira J.P.B., Wang, Z-M, Rubin, H., Huber, R., Bode, W., Schechter, N.M., & Strobl, S. The 2.2 Å Crystal Structure of Human Chymase in Complex with Succinyl-Ala-Ala-Pro-Phe-chloromethylketone: Structural Explanation for its Dipeptidyl Carboxypeptidase Specificity. *J. Mol. Biol.* 286, 163-173, 1999.
56. Avarbock D, Salem J, Li L, Wang Z, & Rubin H. Cloning and characterization of a bifunctional RelA/SpoT homologue from *Mycobacterium tuberculosis*. *Gene* 233, 261-269, 1999.
57. Klein, J.P., Leete, T.H. & Rubin H. A Biomolecular Implementation of Logically Reversible Computation with Minimal Energy Dissipation. *BioSystems* 52, 15-23, 1999.
58. Leete T.H., Schwartz M.D., Williams R.M., Wood D.H., Salem J.S. & Rubin H. Massively Parallel DNA Computation: Expansion of Symbolic Determinants. DIMACS Series in Discrete Mathematics and Theoretical Computer Science. Vol 44, 45-58, 1999.
59. Liu A., Barra A-L., Rubin H., Lu, G. & Gräslund A. Heterogeneity of the Local Electrostatic Environment of the Tyrosyl Radical in *Mycobacterium tuberculosis* Ribonucleotide Reductase Observed by High-Field Electron Paramagnetic Resonance. *Journal of the American Chemical Society* 122, 1974-1978, 2000.

60. Primm, TP., Anderson, SJ., Mizrahi, V., Avarbock, D., Rubin, H* and Barry, CE*. (* corresponding authors). The Stringent Response of *Mycobacterium tuberculosis* is Required for Long-term Survival. J. Bacteriol. 182, 4889-4898, 2000.
61. Pearce, M.C., Rubin, H. and Bottomley, S.P. Conformational Change and Intermediates in the Unfolding of α_1 -Antichymotrypsin. J. Biol. Chem. 275, 28513-28518, 2000.
62. Avarbock, D., Avarbock, A. and Rubin, H. Differential Regulation of Opposing Activities by the Amino-Acylation State of a tRNA-Ribosome-mRNA-Rel_{Mtb} Complex. Biochemistry 39, 11640-11648, 2000.
63. Estbanez-Perpina, E., Fuentes-Prior, P., Belorgey, D., Braun, M., Kiefersauer, K., Maskos, K., Huber, R., Rubin, H. and Bode, W. Crystal Structure of the Caspase Activator Human Granzyme B, a Proteinase Highly Specific for an Asp-P1 Residue. Biological Chemistry 381, 1203-1214, 2000.
64. Alur, R., Belta, C., Ivancic, F., Kumar, V., Mintz, M., Pappas, G.J., Rubin, H. and Schug, J. Hybrid Modeling and Simulation of Biomolecular Networks. In Hybrid Systems: Computation and Control. LNCS 2034. 19-32, 2001.
65. C. Belta, J. Schug, T. Dang, V. Kumar, G. J. Pappas, H. Rubin, P. V. Dunlap, Stability and reachability analysis of a hybrid model of luminescence in the marine bacterium *Vibrio fischeri*, 40th IEEE CDC, Orlando, Florida, 2001
66. Kana, BD., Weinstein, EA., Avarbock, D., Dawes, SS., Rubin, H., Mizrahi, V. Characterization of the *cydAB*-Encoded Cytochrome *bd* Oxidase from *Mycobacterium smegmatis*. J. Bacteriol. 183, 7076-7086, 2001.
67. Plotnick, MI., Samakur, M., Wang, Z-M., Liu, X., Rubin, H., Schechter, NM., Selwood, T. Heterogeneity in serpin-protease complexes as demonstrated by differences in the mechanism of complex breakdown. Biochemistry, 41, 334-342, 2002.
68. Que, X., Brinen, LS., Perkins, P., Herdman, S., Hirata, K., Torian, BE., Rubin, H., McKerrow, JH., Reed, SL. Cysteine Proteases From Distinct Cellular Compartments Are Recruited to Phagocytic Vesicles by *Entamoeba histolytica*. Mol Biochem Parasitol. 119, 23-32, 2002.
69. Plotnick MI, Rubin H, Schechter NM. The Effects of Reactive Site Location on the Inhibitory Properties of the Serpin alpha 1-Antichymotrypsin. J Biol Chem. 277, 29927-29935, 2002.
70. Alur R., Belta C., Kumar V., Mintz M., Pappas G. J., Rubin H., and Schug J., Modeling and analyzing biomolecular networks. Computing in Science and Engineering, Jan/Feb 2002, pp. 20 - 30.
71. Alur R., Belta C., Ivancic F., Kumar V., Rubin H., Schug J., Sokolsky O. and Webb J., Visual programming for modeling and simulation of bioregulatory networks, International Conference on High Performance Computing, Bangalore, India, Dec. 2002

72. Mellet P, Mely Y, Hedstrom L, Cahoon M, Belorgey D, Srividya N, Rubin H, Bieth JG. Comparative trajectories of active and S195A inactive trypsin upon binding to serpins. *J Biol Chem.* 277, 38901-38914, 2002.
73. Dahl, J.L., Kraus, C.N., Boshoff, H.I.M, Doan, B., Foley, K., Avarbock, D., Kaplan, G., Mizrahi, V., Rubin, H., Barry, C.E. III. The role of Rel_{Mtb}-mediated adaptation to stationary phase in long-term persistence of *Mycobacterium tuberculosis* in mice. *Proc. Natl. Acad. Sci. USA* 100:10026-10031, 2003.
74. Dawes, S.S., Qarner, D.F., Tsenova, L., Timm, J., McKinney, J.D., Kaplan, G., Rubin, H., Mizrahi, V. Ribonucleotide reduction in *Mycobacterium tuberculosis*. Function and expression of the class Ib and class II ribonucleotide-reductase-encoding genes. *Infection and Immunity.* 71:6124-6131, 2003.
75. Bi, H., Chen, J., Deaton, R., Garzon, M., Rubin, H., and Wood, D.H. In vitro selection of non-crosshybridizing oligonucleotides for computation. *Natural Computing.* 417-426. 2003.
76. Uppsten, M., Davis, J.S., Rubin, H., and Uhlin, U. Crystal structure of the biologically active form of class Ib ribonucleotide reductase small subunit from *Mycobacterium tuberculosis*. *FEBS Lett.* 569, 117-22. 2004.
77. Belta, C., Finin, P., Habets, L.C., Halasz, A., Imielinski, M., Kumar, V., and Rubin, H. Understanding the Bacterial Stringent Response Using Reachability Analysis of Hybrid Systems. 7th International Workshop on Hybrid Systems: Computation and Control. *Lecture Notes in Computer Science* 2993. R. Alur and G. J. Pappas (Eds.) 111-125. 2004.
78. Imielinski, M., Belta, C., Halasz, A. and Rubin, H. Investigating metabolite essentiality through genome-scale analysis of *Escherichia coli* production capabilities. *Bioinformatics.* 21:2008-2016. 2005.
79. Weinstein E.A., Yano T., Li L-S., Avarbock D., Avarbock A., Helm D., McColm A.A., Duncan K., Lonsdale J.T., Rubin, H. Inhibitors of type II NADH:menaquinone oxidoreductase represent a class of antitubercular drugs. *Proc. Natl. Acad. Sci. USA.* 102: 4548–4553. 2005.
80. Avarbock A., Avarbock D., Teh J-S., Buckstein M., Wang Z-M, Rubin H. Functional Regulation of the Opposing (p)ppGpp Synthetase/Hydrolase Activities of Rel_{Mtb} from *Mycobacterium tuberculosis*. *Biochemistry.* , 44:9913-9923. 2005.
81. Matsoso LG, Kana BD, Crellin PK, Lea-Smith DJ, Pelosi A, Powell D, Dawes SS, Rubin H, Coppel RL, Mizrahi V. Function of the Cytochrome *bc1-aa3* Branch of the Respiratory Network in *Mycobacteria* and Network Adaptation Occurring in Response to its Disruption. *J Bacteriol.* 187:6300-8. 2005.
82. Imielinski, M., Belta, C., Rubin, H., Halasz, A. Systematic analysis of conservation relations in *E. coli*: genome-scale metabolic network reveals novel growth media. *Biophys J.* 90:2659-72. 2006.

83. Yano T, Li LS, Weinstein E, Teh JS, Rubin H.. Steady-state kinetics and inhibitory action of antitubercular phenothiazines on *Mycobacterium tuberculosis* type-II NADH-menaquinone oxidoreductase (NDH-2). *J. Biol. Chem.* 281:11456-63. 2006.
84. Zhu L, Zhang Y, Teh JS, Zhang J, Connell N, Rubin H, Inouye M. Characterization of mRNA interferases from *Mycobacterium tuberculosis*. *J. Biol. Chem.* 281, 638-643. 2006.
85. Halasz A, Kumar V, Imielinski M, Belta C, Sokolsky O, Pathak S, Rubin H. Analysis of lactose metabolism in *E. Coli* using reachability analysis of hybrid systems. *IET Syst Biol.* 2007 Mar;1(2):130-48.
86. Teh, JS., Yano, T., and Rubin, H. Type II NADH: menaquinone oxidoreductase of *Mycobacterium tuberculosis*. *Infect Disord Drug Targets.* 2007 Jun;7(2):169-81. Review.
87. Halasz, A., Kumar, V., Rubin, H. Quantitative Model of Stringent Response in *E.coli* Explains Spontaneous Persister Generation. Proceedings of the Eighth International Conference on Systems Biology. found at <http://www.icsb-2007.org/proceedings/abstracts/F60.pdf>.
88. Buckstein, M., Rubin, H. Characterization of Nucleotide Pools as a Function of Physiological State in *Escherichia coli*. *J Bacteriol.* 2008 Jan;190(2):718-26.
89. Julius, A. A. Halasz, A.; Sakar, M. S.; Rubin, H.; Kumar, V.; Pappas, G. J. Stochastic Modeling and Control of Biological Systems: The Lactose Regulation System of *Escherichia coli*. *IEEE Transactions on Automatic Control*, 53, 51 – 65, 2008.
90. Kana, BD., Machowski, EE., Schechter, N., Teh, JS., Rubin, H. and Mizrahi, V. Electron transport and respiration in mycobacteria. In *Mycobacterium: Genomics and Molecular Biology*, Caister Academic Press, January 2009. [Review, in press].
91. Rubin, H. and Rao, C. K. An enforceable international compact for infectious diseases: strategies to operationalize new initiatives to strengthen global health security. *Current Science.* 96, 658-663, 2009.