CURRICULUM VITAE

Richard Perrier Channing Rodgers, M.D.

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GENERAL INFORMATION

- **Current Appointment/Address**

Computer Science Branch
Lister Hill National Center for Biomedical Communications
Building 38A, Room 9S-916
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- **Personal Information**

Citizenship: USA
PHS Service No.: 47406
Social Security Number: 529-68-1967

- **Professional Interests**

Specific: network-based biomedical information retrieval; medical informatics applied to clinical medicine (particularly to the clinical laboratory); chemical and statistical design optimization of analytical techniques which utilize binder-ligand reactions; statistical evaluation of the performance of diagnostic tests; cost-effectiveness analysis of clinical procedures; statistical mechanics of binder-ligand interactions.

U.S. PUBLIC HEALTH SERVICE HISTORY

- **Clinical Specialty Consultant (1992-present)**

  - **Responsibilities**

    In charge of development of the Information Sources Map (ISM), one of three components of the Unified Medical Language System™ (UMLS), a major research and development initiative of the National Library of Medicine. Supervise one full-time contract programmer. Manage NLM component of an interagency cooperative agreement with the National Science Foundation (NSF). Chair, NCSA Mosaic Federal Consortium, a group of (currently) ten federal agencies that are funding further development of NCSA Mosaic, a network information delivery system of major international importance. Participate in several NLM committees concerned with the development and redesign of online information services, and the creation of network-accessible repositories of patient education materials.

  - **Accomplishments**

    Successfully released three new editions of the ISM on CD ROM. Devised an automated software suite for internal consistency and error checking for the ISM. Produced a prototype Internet-based hypertext/multimedia system for the NLM, HyperDOC,™ starting collaborations with several sections of the NLM to provide biomedical information via this system. As of October, 1994, HyperDOC was performing over 90,000 file transfers per month, in response to requests from over 9300 distinct computer sites scattered around the world. Successfully organized a technically innovative meeting concerned with the subject of Internet-based information retrieval, SIGNIDR III, which was simulcast over the Internet to over 80 sites around the world. Helped organize an international meeting on the subject of World-Wide Web technology. Evaluated a wide variety of computing standards applicable to the ISM, and participated actively in the deliberations of two pertinent standard setting bodies, the Internet Engineering Task Force (IETF) and the Z39.50 Implementors Workshop (ZIG). Designed and began to implement a prototype software application for the ISM, Sourcerer™, which operates through HyperDOC, and which employs an English-language query to automatically determine which of numerous information sources in the ISM might provide helpful information, and then to connect to those sources and retrieve relevant data. Developed an associated application, Apprentice, to register new information sources over the Internet. Created OnLine Images (OLI), a World-Wide Web-based system for retrieval and display of specified items from large cataloged image archives, which is currently in use at NLM and soon to be in use at other sites throughout the world. Devised a plan to implement a network server using the Z39.50 protocol to deliver NLM information services, and helped recruit an appropriate expert to work on the problem for a year under an IPA agreement with the University of California. Participated annually as an instructor in three teaching programs: a NLM-organized course in medical informatics held at the Woods Hole Marine Biological Laboratory; the annual NLM Medical Informatics Elective for medical students; and, the teaching of NLM Library Associates.

- **Clinically Related Activities**

  U.S. Coast Guard (1993). Devised and taught course related to physician office laboratory procedures and the quality control requirements of the Clinical Laboratory Improvement Act of 1988 (CLIA).

  San Francisco Department of Veterans Affairs Medical Center (1994). Helped with the early stages of setting up a new molecular diagnostics facility in the clinical laboratory.

- **Continuing Education Within PHS**

  Basic Project Officer Training Course (Research), 1993.

  Writing Statements of Work — Non-Research and Development, 1994.

- **USPHS Support Activities**

  Chairman, Technical Evaluation Group 4 (Computerization of the Clinical Patient Record), Broad Agency Announcement (1993).

- **Inactive reserve (1980-1992)**

- **Senior Assistant Surgeon (1978-1980)**

PREVIOUS PROFESSIONAL APPOINTMENTS

1) Assistant Professor in Residence (1984-1987)
   Adjunct Assistant Professor (1987-1992)
   Department of Laboratory Medicine
   School of Medicine
   University of California, San Francisco

2) Assistant Research Chemist (1987-1992)
Department of Pharmaceutical Chemistry
School of Pharmacy
University of California, San Francisco

EDUCATION & TRAINING

• Postgraduate Education

1) Resident in Laboratory Medicine (1982-1984). Department of Laboratory Medicine, University of California, San Francisco.
2) ICP Fellow (1980-1982). Unité de Médecine Expérimentale, International Institute of Cellular and Molecular Pathology, Université Catholique de Louvain, Bruxelles, Belgium. Studying the basic biophysical principles underlying latex particle agglutination assays in clinical medicine.
3) Research Associate (1978-1980). Laboratory of Theoretical Biology, National Cancer Institute, National Institutes of Health, Bethesda, Maryland, USA. Theoretical studies of radioimmunoassay and application of compartmental and non-compartmental computer modeling methods to problems in biology and medicine.
4) Research Fellow (1977-1978). Department of Nuclear Medicine, Middlesex Hospital Medical School, London, United Kingdom. Optimization of radioimmunoassay design using computer modeling methods.
5) Internal Medicine Resident (1976-1977). St. Mary's Hospital and Medical Center, San Francisco, California, USA.

• Medical Information Science Training

1) UNIX courses (1984). Academic Computing Services, University of California, Berkeley.
2) Term-time employment (1970-1971). Massachusetts General Hospital MEDLAB project.
3) Term-time employment (1968-1969). Department of Computer Science, Massachusetts General Hospital.
4) Summer employment (1969). Guest worker, Children's Clinic, University of Kiel, Federal Republic of Germany.
5) Summers employment (1967, 1968, 1970). Summer traineeship, Department of Biophysics and Bioengineering, University of Utah (a pioneering group in the discipline of medical computing).

• Graduate Education

Doctor of Medicine (1976). University of Utah College of Medicine, Salt Lake City, Utah, USA.

• Undergraduate Education

Bachelor of Arts *cum laude* in Biochemical Sciences (1972). Harvard College, Cambridge, Massachusetts, USA.
Recipient of Harvard College and National Merit Scholarships

• College Preparatory Education

Diploma (1968). Skyline Senior High School, Salt Lake City, Utah, USA.

• Foreign Language Training

French, German.

- **Computer Languages / Operating Systems**

  Algol, awk, BAP, BASIC, C, FORTRAN, MLAB, MUMPS, Pascal, SAAM, SAIL, troff; TOPS-10, TOPS-20, UNIX, VMS.

- **Other Types of Technical Training**

  Scientific illustration and photography.

PROFESSIONAL CERTIFICATION, LICENSURE, & MEMBERSHIPS

• **Advanced Professional Certification**

Diplomate in Clinical Pathology (June 1984), American Board of Pathology

• **Professional Licenses**

1) Physician and Surgeon, Commonwealth of Massachusetts (inactive status).
2) Physician and Surgeon, State of California.

• **Professional Organizations**

1) Member, Academy of Clinical Laboratory Physicians and Scientists.
2) Member, American College of Physicians.
3) Member, American Medical Informatics Association.
4) Fellow, American Society of Clinical Pathologists.
5) Fellow, College of American Pathologists.
6) Member, Internet Engineering Task Force (IETF) Working Groups on User Services.
7) Founding Member, International World-Wide Web Conference Committee (IW3C2).
8) Member, New York Academy of Sciences.
9) Member, Society for Medical Decision Making.
10) Member, USENIX (UNIX Users' Society).
11) Member, Z39.50 Implementor's Workshop (ZIG).

RESEARCH & CREATIVE ACTIVITY

• **Meetings Organized**

1) Second International World-Wide Web Conference (Chicago, 17-20 October 1994). This meeting attracted over 1300 attendees, participating in multiple simultaneous sessions. Directed the multicasting of live audio and video from the meeting over the Internet via the MBONE virtual network to approximately 400 remote participants.
2) Z39.50 Implementor's Group (ZIG) (NLM, April 1994). The meeting, which included over 60 participants, continued work on defining version 3 of the Z39.50 standard, an important protocol for network-based delivery of bibliographic and other information, which is important to NLM's future information services.
3) SIGNIDR/SIGWAIS III (Lister Hill Center, 12 November 1993). Dealing with Internet-based information retrieval by computer, this meeting was attended by over 180 participants at the Lister Hill Center, and seen by viewers at over 60 remote sites scattered throughout the world, by means of being simulcast over the Internet using the experimental *mbone* multicasting system. Traditional audiovisual aids were banned from the meeting, with all presentation materials being projected from a UNIX computer workstation using a program known as NCSA Mosaic. This technically complex meeting was intended to be a prototype of the electronic meeting of the future.

• **Editorial Boards**

1) Associate Editor, Computers in Biology and Medicine (Pergamon Press).
2) Editorial Committee, First and Second International World-Wide Web Conferences.

• Articles Reviewed for Other Journals:

1) Analytical Biochemistry
2) Clinical Chemistry
3) Computers in Biomedical Research
4) Immunology
5) Journal of the American Medical Informatics Association (JAMIA)
6) Journal of Clinical Chemistry and Clinical Biochemistry
7) Journal of Immunoassay
8) Journal of Theoretical Biology
9) Medical Decision Making

• USPHS Honors and Awards

1) PHS Commendation Medal, 30 June 1994.

• Grants and Awards

1) Grant, San Diego Supercomputing Facility (CRAY computing time for Monte Carlo simulation of random sphere aggregation, 1986).
2) Grant, Research Corporation ($10,500 for particle aggregation modeling, 1985).
3) Grant, Research Evaluation and Allocation Committee ($4000 for critical review of the diagnostic efficiency of laboratory tests, including the bleeding time, 1985).
4) Grant, Academic Senate of the University of California ($6000 for particle aggregation modeling, 1985).
5) Research Associateship Award, Veterans Administration Research Career Development Program, providing full salary support for entry-level faculty appointment (July 1984-June 1987).
6) FEBS travel grant, Nov. 1981, to allow travel from Brussels, Belgium, to the United Kingdom for initiation of a collaboration on the basic principles of latex agglutination reactions with Prof. Manfred Gordon of the Universities of Essex and Cambridge.

• Software Written

1) *Apprentice* (1994): currently in prototype, this application provides a forms-based interface which allows users anywhere on the Internet to register a biomedical information resource as a candidate for entry into the NLM's Information Sources Map (ISM).
2) *Sourcerer* (1994): currently in prototype, this system utilizes the Metathesaurus and semantic network of the NLM's Unified Medical Language System (UMLS); it accepts English-language queries, automatically determines which network-based information sources (listed in the ISM) are appropriate to respond to the query, and connects to and queries the sources, returning the information to the originator of the request. Among other innovations, this is the first Internet-based application to successfully employ an Internet-based server to map Uniform Resources Numbers (URNs) to Uniform Resource Locators (URLs), in accord with standards being developed within the Internet Engineering Task Force (IETF).
3) *Bugs on the Web* (1994): currently in prototype, this is an experimental World-Wide Web-based multimedia/hypertext system for computer-aided instruction in parasitology, being developed in collaboration with Dr. Dan Ricks of the London School of Hygiene and Tropical Health. This project also represents a novel attempt at a network-distributed edited work, building upon visual materials contributed by a number of recognized authorities in the field of parasitology.

4) *OnLine Images* (OLI, 1994): a system for the retrieval and presentation of specified portions of large cataloged image archives, via the World-Wide Web. This system was first applied to 59,000 images from the prints and photographs collection of the NLM's History of Medicine Division. This system is publically accessible via HyperDOC, and as of October 1994, was delivering over 41,000 files per month to over 1860 distinct computers. This technology is being shared with other groups: twenty organizations have indicated a desire to use OLI to deliver their image collections, and the first of these, NASA, already has a working prototype in testing.

5) *HyperDOC* (1993-present): a hypertext/multimedia information retrieval system for the National Library of Medicine (1993). Employing a system known as *World Wide Web*, and accessible via the Internet computer network, HyperDOC includes a mixture of images, text, audio files, and full-motion video files describing activities and services at the NLM; access to on-line interactive adaptations of exhibits from the NLM's History of Medicine Division, the National Cancer Institute, and the office of the PHS historian; and, on-line databases and catalogs. HyperDOC has served as the focus of new initiatives throughout the NLM, concerned with network-based information delivery.

6) The *UMLS Information Sources Map* (ISM; July 1992 — June 1993): released two new revisions of this pre-existing database of biomedical information sources; these were validated by an extensive set of original software tools designed for internal consistency checking and error detection and correction

7) *BibIX*: a comprehensive bibliographic database and text formatting system, integrated with ETT. Current release: 2.1 (1992). This packages is being licensed to commercial software vendors by the Berkeley Office of Technology Licensing.

8) *System Manager's Toolkit*: suite of programs and documentation for automated system administration of a UNIX computing facility. Current release: 2.1 (1992). Distributed by the Berkeley Office of Technology Licensing.

9) *batchqueue*, an automated batch job queuing system for BSD UNIX. Current release: 2.1 (1992). Distributed by the Berkeley Office of Technology Licensing.

10) *AcademIX*, a suite of programs to facilitate routine academic office functions under UNIX, including *UNIletter*, an automated correspondence system, and *CV*, a *curriculum vitae* maintenance system. Current release: 2.1 (1992). Distributed by the Berkeley Office of Technology Licensing.

11) ETT (*UCSF Enhanced troff/TRANSCRIPT*), a comprehensive text-formatting environment for academics. Current release: 2.2. Distributed by the Berkeley Office of Technology Licensing.

12) *contor*: a menu-driven front-end for contour mapping with the <PLOT79> scientific line graphics package (1980-87).

13) *<PLOT79>*: collaboration with primary author Nelson Beebe in UNIX installation and extension of this comprehensive scientific line graphics package (1986-present).

14) INSULIN: an MLAB program for fitting insulin receptor ligand binding data.

15) CLASP: 19,000 line FORTRAN77 program for comprehensive simulation of radioimmunoassay.

• Invited Presentations

1) *World-Wide Web and Digital Video on the Internet*, a tutorial presented in collaboration with Professor Lawrence Rowe of the University of California (Berkeley), Seminar on Computer Applications in Medical Care (SCAMC), Washington, DC, 5-6 May 1994.

2) *On-Line Images from the History of Medicine*, CENDI meeting. NLM, 6 October 1994.

3) *On-Line Images from the History of Medicine*, a presentation before the Board of Regents of the National Library of Medicine, 28 September 1994.

4) *The National Library of Medicine on the Internet: A Digital Library for Biomedicine*, American Chemical Society annual meeting, Washington, DC, 23 August 1994.

5) *The Internet as a Tool for Biomedical Information Retrieval*, San Francisco Department of Veterans Affairs Medical Center, 13 May 1994.

6) *On-Line Images from the History of Medicine: An Internet-Based tool for Scholars*, Bay Area History of Medicine Club & the UCSF Library and Center for Knowledge Management, University of California, San Francisco, 11 May 1994.

7) *The World-Wide Web and the NLM's Information Sources Map (ISM) Project*, Department of Medical Informatics, University of Utah College of Medicine, 10 May 1994.

8) *The NLM's UMLS Project, and the Information Sources Map (ISM)*, Eccles Medical Library, University of Utah College of Medicine, 10 May 1994.

9) *Recent Developments in Information Dissemination on the Internet*, Grand Rounds of the Department of Laboratory Medicine, University of California, San Francisco, 2 May 1994.

10) *An Introduction to the Internet*, a tutorial, American Medical Informatics Association (AMIA) Spring Congress, San Francisco, 4 May 1994.

11) *The Internet and the Ongoing Revolution in Biomedical Communications*, Department of Pathology, National Children's Medical Center, Washington, DC, 11 January 1994.

12) *What this Meeting is About: An Introduction, Outline, & Acknowledgments*, SIGNIDR III (Special Interest Group for Networked Information Discovery and Retrieval), NLM, 12 November 1993.

13) Panel member, *Network Information Navigation*, Medical special interest area, American Society for Information Science (ASIS) national meeting, Columbus, Ohio, 28 October 1993.

14) *Network-Based Information Retrieval*, a presentation before the Toxicology Round Table at the NLM, 20 October 1993.

15) *NCSA Mosaic for X*, a presentation before the Board of Regents of the National Library of Medicine, 30 September 1993.

16) *NCSA Mosaic for X*, a presentation before the staff of the Office of the Director, National Library of Medicine, 14 September 1993.

17) *The Internet*, a day-long combined lecture and laboratory session, presented as part of a NLM-organized course in Medical Informatics at the Woods Hole Marine Biology Laboratory, 1 June 1993.

18) *A critical reappraisal of the bleeding time test*, Division of Laboratory Medicine, School of Medicine, University of Wisconsin, Madison, WI, 12 November 1990.

19) *Selecting assay software: many questions, fewer answers*, BIO-CLUB Mini-Course on ELISA Software, Free University of Brussels, Brussels, Belgium, 28 June 1990.

20) *A critical reappraisal of the predictive value of the bleeding time*, Session on Utilization of Screening Tests, American Society of Hematology, Atlanta, GA, 3 December 1989.

21) *Predictive value of the bleeding time: applying new tools to an old test*, Laboratory Medicine Grand Rounds, UCSF, San Francisco, 6 November 1989.

22) *Basic principles of ligand assay data processing and quality control*, Molecular Devices, Palo Alto, CA, 22 March 1989.

23) *Basic principles of ligand assay data processing and quality control*, Genentech, South San Francisco, CA, 9 November 1988.

24) *The UNIX-based bibIX bibliographic system and how it may serve the MMWB group*, Macromolecular Workbench seminar, 6 April 1988.

25) *The theory of stochastic branching processes (the cascade formalism) applied to aggregation phenomena*, Macromolecular Workbench seminar, 9 December 1988.

26) *Medical Decision Sciences and Clinical Test Evaluation: A Critical Re-evaluation of the Bleeding Time Test*, Health Informatics Seminar, University of Minnesota, 12 November 1987.

27) *A Cost-Effectiveness Model for Laboratory Quality Assurance*, Department of Laboratory Medicine and Pathology, University of Minnesota, 11 November 1987.

28) *Cascade theory applied to latex particle agglutination assay*, City of Hope Medical Center, Duarte, CA, October 1987.

29) *A physical model for latex particle agglutination assays based upon cascade theory*, Department of Pathology, State University of New York at Stony Brook, 27 April 1987.

30) *The theory of stochastic branching processes applied to latex particle aggregation phenomena*, Dill-Siegel research group meeting, UCSF School of Pharmacy, 18 February 1987.

31) *Automated assay data processing and quality control: A review and recommendations*, International Symposium on Radioimmunoassay and Related Procedures in Medicine, Vienna, Austria, 21-25 June 1982.

32) *A formal model for the cost-effectiveness of assay quality control*, International Symposium on Cost and Benefit of Radioimmunoassay, Milan, Italy, 15-16 May 1984.

• **Inventions**

1) Kit for determination of total lung capacity from routine chest radiograms using a hand-held calculator.

2) Disposable micro-dialysis cell.

LIST OF PUBLICATIONS

• Monographs, Books and Book Chapters (Authorial Index* = 6.50)

1. **Stites, DP, Rodgers, RPC**. Clinical laboratory methods for detection of antigens and antibodies. In: Stites, DP, Terr, AI, ed., *Basic and Clinical Immunology*. Norwalk, Connecticut: Appleton and Lange, 1993. Eighth edition.
2. **Stites, DP, Rodgers, RPC**. Clinical laboratory methods for detection of antigens and antibodies. In: Stites, DP, Terr, AI, ed., *Basic and Clinical Immunology*. Norwalk, Connecticut: Appleton and Lange, 1991: 217-262. Seventh edition.
3. **Rodgers, RPC**. Data Processing of Immunoassay Results. In: Fahey, JL, Friedman, H, Rose, NR, ed., *Manual of Clinical Laboratory Immunology, 3rd Edition*. Washington, D.C.: American Society for Microbiology, 1986: 82-87.
4. **Rodgers, RPC**. Data analysis and quality control of assays: a practical primer. In: Butt, WR, ed., *Practical Immunoassay: The State of the Art*. New York: Dekker, 1983: 253-308.
5. **Rodgers, RPC**. *Data Processing and Quality Control in Binder-Ligand Assay: A Practical Introduction*. Anaheim, California: Scientific Newsletters, Inc., 1981. (329 pages).
6. **Rodbard, D, Rodgers, RC**. The kinetics of radioligand assays. In: Antoniades, HN, ed., *Hormones and Human Blood*. Cambridge, Massachusetts: Harvard University Press, 1976: 92-114.
7. **Rodgers, RPC**. *Radioimmunoassay Theory for Health Care Professionals*. Loveland, Colorado: Hewlett-Packard Co., 1974. (55 pages).
8. **Rodgers, RPC**. *Equilibrium and Transient-State Mathematical Theory of Saturation Analysis*. 1972. (130 pages). Thesis, Program in Biochemical Sciences, Harvard College (awarded *summa cum laude* grade).

• Proceedings of Scholarly Meetings (Authorial Index = 2.83)

1. **Rodgers, RPC, Srinivasan, S**. On-Line Images from the History of Medicine (OLI): Creating a Large Searchable Image Database for Distribution via World-Wide Web. Geneva: 25-27 May 1994: 423-431.
2. **Rodgers, RPC, Srinivasan, S, Fullton, J**. Sourcerer: Thesaurus-assisted Automated Source Identification for the World-Wide Web. Chicago: 17-20 October 1994. http://www.ncsa.uiuc.edu/SDG/IT94/IT94info.html.
3. **Rodgers, RPC**. A formal model for the cost-effectiveness of assay quality control. In: Albertini, A, Ekins, R, Galen, R, ed., Amsterdam: Elsevier Press, 1984: 51-62. Proceedings of an International Symposium, Milan, 15-16 May 1984, sponsored by the Fondazione Giovanni Lorenzini.
4. **Rodgers, RPC**. Automated assay data processing and quality control: a review and recommendations (invited review). Vienna: International Atomic Energy Agency, 1982: 383-409. Proceedings of a Symposium, Vienna, 21-25 June 1982.

• Articles in Peer-Reviewed Journals (Authorial Index = 7.97)

1. **Rodgers, RPC**. An introduction to the cascade formalism (as applied to polymerization and aggregation phenomena). *J Polym Sci Polym Phys*. 1995 (accepted for publication).
2. **Rodgers, RPC, Baddeley, A**. Nested Monte Carlo study of random packing on the sphere. *Journal of Applied Probability* 1991 (in press).

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* The Authorial Index is the sum, for all publications in a category, of [1 / (Number of Authors)]

3. **Roy, S, Morrow, WJW, Christian, C, Khayam-Bashi, H, Busch, MP, McCarthy, R, Rodgers, RPC, Vyas, G**. Persistent immune complexes and abnormal CD4/CD8 ratios in HIV infection. *J Acq Immune Defic Synd* 1990; 3: 134-138.
4. **Rodgers, RPC**. Supplementary Bleeding Time Bibliography. *Semin Thromb Hemostas* 1990; 16: 139-144.
5. **Rodgers, RPC, Levin, J**. A critical reappraisal of the bleeding time. *Semin Thromb Hemostas* 1990; 16: 1-20.
6. **Rodgers, RPC**. The bleeding time tables. A tabular summary of pertinent literature. *Semin Thromb Hemostas* 1990; 16: 21-138.
7. **Beebe, NHF, Rodgers, RPC**. <PLOT79>: A comprehensive portable Fortran scientific line graphics system, as applied to biomedical research. *Comput Biol Med* 1989; 19: 385-402.
8. **Krowka, JF, Stites, DP, Moss, AR, Casavant, CH, Carlson, JR, Chermann, JC, Barre-Sinoussi, F, Rodgers, RPC, Bacchetti, P, McHugh, TM, et al**. Interrelations of lymphocyte subset values, human immunodeficiency virus antibodies, and HIV antigen levels of homosexual males in San Francisco. *Diagn Clin Immunol* 1988; 5: 381-387.
9. **Rodgers, RPC**. How much quality control is enough? A cost-effectiveness model for clinical laboratory quality control procedures (illustrated by its application to a ligand-assay-based screening program). *Med Decis Making* 1987; 7: 156-167.
10. **Cohen, MB, Rodgers, RPC, Hales, MS, Gonzales, JM, Ljung, BME, Beckstead, JH, Bottles, K, Miller, TR**. Influence of training and experience in fine-needle aspiration biopsy of breast: Receiver Operating Characteristics curve analysis. *Arch Pathol Lab Med* 1987; 111: 518-520.
11. **Rodgers, RPC**. A complete system for barcode generation on the HP-41CX hand-held computer using a standard thermal printer. *Comput Biol Med* 1985; 15: 397-421.
12. **Dudley, RA, Edwards, P, Ekins, RP, Finney, DJ, McKenzie, IGM, Raab, GM, Rodbard, D, Rodgers, RPC**. Guidelines for immunoassay data processing. *Clin Chem* 1985; 31: 1264-1271.
13. **Rodgers, RPC, Tannen, R**. Rapid and accurate determination of total lung capacity (TLC) from routine chest radiograms using a programmable hand-held calculator. *Comput Biol Med* 1983; 13: 125-140.
14. **Rodgers, RC, Hill, GE**. Equations for vapour pressure versus temperature: derivation and use of the Antoine equation on a hand-held programmable calculator. *Br J Anaes* 1978; 50: 415-424.

• **Technical Reports (Authorial Index = 9.03)**

1. **Rodgers, RPC, Huang, C**. UCSF Enhanced troff/TRANSCRIPT — an overview. *LSMB Technical Report 90-2*. San Francisco: Department of Pharmaceutical Chemistry, UCSF School of Pharmacy, 1990. Release 2.2.
2. **Rodgers, RPC, Huang, C, Gardels, K**. BibIX: a bibliograpic data base and text formatting system for UNIX. *LSMB Technical Report 90-1*. San Francisco: Department of Pharmaceutical Chemistry, UCSF School of Pharmacy, 1990. Release 2.1.
3. **Lesk, ME, Kies, J, Heydt, D, Borst-Rothe, K, Rodgers, RPC**. Text formatting with *troff* using the berkeley -ms macros. *LSMB Technical Report 90-3*. San Francisco: Department of Pharmaceutical Chemistry, UCSF School of Pharmacy, 1990. Release 2.2.
4. **Rodgers, RPC**, ed. UCSF Enhanced troff/TRANSCRIPT — manual set. *LSMB Technical Reports 90-3 through 90-9*. San Francisco: Department of Pharmaceutical Chemistry, UCSF School of Pharmacy, 1990. Release 2.2.
5. **Rodgers, RPC**. An introduction to the local computing environment. *LSMB Technical Report 89-1*. San Francisco: Laboratory for Statistical Mechanics of Biomolecules, Department of Pharmaceutical Chemistry, 1989.

6. **Rodgers, RPC**. Typealetter/takealetter: An automated correspondence system for UNIX. *CALM/MedIX Technical Report 87-7*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.
7. **Rodgers, RPC**. System management tools for the Sun workstation. *CALM/MedIX Technical Report 87-1*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.
8. **Rodgers, RPC**. Printcv.sh: A *curriculum vitae* production and maintenance system for UNIX. *CALM/MedIX Technical Report 87-4*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.
9. **Rodgers, RPC**. Interactive spelling correction with automatic maintenance of a locally extensible dictionary. *CALM/MedIX Technical Report 87-3*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.
10. **Rodgers, RPC**. Installing <PLOT79> on the Sun 3/160 workstation. *CALM/MedIX Technical Report 87-8*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.
11. **Rodgers, RPC, Katzung, B**. Archive and backup: scripts for automated tape management under UNIX. *CALM/MedIX Technical Report 87-5*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.
12. **Katzung, B, Rodgers, RPC**. Supporting the NEC Spinwriter under UNIX with multiple printer spooling queues. *CALM/MedIX Technical Report 87-6*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.
13. **Katzung, B, Rodgers, RPC**. Callback: a return-dial modem software system for UNIX. *CALM/MedIX Technical Report 87-2*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.
14. **Beebe, NHF, Rodgers, RPC**. SLIDES: A command interpreter for the <PLOT79> core facility. *CALM/MedIX Technical Report 87-9*. San Francisco: Department of Laboratory Medicine, UCSF School of Medicine, 1987.

• Other Published Works (Authorial Index = 2.50)

1. **Rodgers, RPC**. The Bleeding Time. In: Cohen, SN, Gottfried, EL, Nicoll, CD, ed., *Laboratory Medicine Newsletter*. San Francisco: Department of Laboratory Medicine, University of California, 1991.
2. **Rodgers, RPC**. The elusive goal of optimal quality control. In: Bensen, E, ed., *Clinical Chemistry Data Communication Group (CCDCG)*. Minneapolis: January 1990. (Editorial).
3. **Rodgers, RPC, Levin, J**. Bleeding time. *Arch Pathol Lab Med* 1990; 114. (Letter).

• Work in Preparation or Submitted for Publication (Authorial Index = 1.83)

1. **Rodgers, RPC, Gordon, M**. A stochastic branching model for latex particle aggregation phenomena, with provision for steric occlusion. 1993.
2. **Rodgers, RPC**. A physical chemical model for latex particle aggregation phenomena. 1993.
3. **Rodgers, RPC, Ekins, RP, Elliott, S**. A comprehensive theoretical model for binder-ligand assay: a tool for achieving new insights into principles of analytical design. 1993.