

CURRICULUM VITAE

Name: Charles Franklin Starmer, Jr. (Frank)

Date and Place of Birth: September 4, 1941, Greensboro, NC

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Duke-NUS Gateway to Learning: <http://duke-nus.org>

Marital Status: Married; four adult "children"

Education: Duke University, B.S.E.E., 1963 (Electrical Engineering)
Duke University, M.S.E.E., 1965 (Electrical Engineering)
Rice University, 1965-1966
University of North Carolina, Ph.D., 1968 (Biomathematics and Bioengineering)

Academic Experience:

1961-1965: Research Associate, Department of Medicine, Duke University
1966-1968: Associate in Biomathematics, Duke University Medical Center
1968-1971: Assistant Professor of Medicine (Computer Science) Duke University
1971-1978: Associate Professor of Computer Science and Assistant Professor of Medicine, Duke University
1976-1977: Visiting Associate Professor of Computer Science, Washington University, St. Louis
1978-1990: Professor of Computer Science and Associate Professor of Experimental Medicine (Division of Cardiology), Duke University
1990-1997: Professor of Computer Science and Professor of Experimental Medicine (Division of Cardiology), Duke University
1993-1994: Visiting Professor of Biomedical Engineering, Indian Institute of Technology (Madras)
1997-1998: Visiting Professor of Medical Physics, University of Patras, Greece
1997-present: Professor Emeritus of Computer Science, Duke University
1998-2006: Adjunct Professor of Computer Science, College of Charleston
1998-2006: Associate Provost for Information Technology, Professor of Biostatistics/Bioinformatics/Epidemiology and Medicine (Cardiology), Medical University of South Carolina
2006-present: Associate Dean for Learning Technologies, Duke-NUS Graduate Medical School Singapore and Professor of Biostatistics and Bioinformatics, Duke University

International Collaborations:

1976-1982: Clinical Trials Database Consultant, Roche, Basel, Switzerland
1987-1991: Visiting Professor, All Union Institute of Cardiology, Moscow, Russia (Prof. Rosenshtraukh's Laboratory).
1989-1997: Genetics Database Consultant, Medical Genetics Center, Ain Shams University, Cairo, Egypt (Dr. Nemat Hashem, Director (deceased))
1991 (August): Visiting Professor, Freiburg University, Physiology Institute

- (Dr. Jorg Weirich's Laboratory)
- 1992-2002: Visiting Professor, Institute of Experimental and Theoretical Biophysics, Pushchino, Russia (Krinsky's Autowave Lab, now Medvinsky's Lab of Biophysics of Active Media)
- 1993-1994: Visiting Professor, Indian Institute of Technology - Madras, Department of Applied Mechanics, Division of Bio-Engineering
- 1995-1998: Visiting Professor, Institute of Cell Biophysics, Pushchino, Russia (Kukushkin's Lab)
- 1997-1998: Fulbright Scholar, University of Patras, Medical Physics Department, Patras, Greece

Awards:

- Eagle Scout
- NIH Research Career Development Award (HL70102), 1972-1977
- New York Marathon 1980, 1981, 3:32
- Fulbright Scholar, University of Patras, Greece, July 1997-January 1998

Society Memberships:

- Retired Fellow of American College of Medical Informatics
- Biomedical Engineering Society of India (life member)
- Indian Association of Biomedical Scientists (life member)
- Indian Association of Physiologists and Pharmacologists (life member)

NIH Grants:

- HL070102 1972-1977 Research Career Development Award: Computer Recognition of Patterns in Heart Disease
- HL014811 1972-1975 Computer retrieval and analysis of cardiovascular data
- HS001613 1974-1977 Laboratory for development of health information systems
- LM003373 1979-1984 Medical Databases and Clinical Investigation (Training Grant)
- RR001693 1983-1985 User Software Interface
- HL032994 1984-1998 Models of Drug Binding to Cardiac Sodium Channels

Photo Credits and Newspaper Articles

1. KAPOW: Superhero Science, Discovery Channel, November 9, 2003
2. Spiders Spin Out, 2004: <http://www.abc.net.au/science/scribblygum/february2004/>
3. Risk Takers, Mickey Rogers and Advanced Blasting Services: Discovery Channel High Definition, May 2007
4. Steel's role in construction: Engineering News Record, <http://www.enr.construction.com/resources/special/archives/2005/steel2.asp>
5. Having the diversity to respond: The demolition industry in the 21st Century. Engineering News Record, <http://enr.construction.com/resources/special/archives/2005/demolition.asp>
6. Lower Secondary Science Textbook Volume 2 (MOE approved, Singapore)
7. Gerritsen, V.B. The tiptoe of an airbus. Protein Spotlight 24, July 2002 (<http://www.proteinspotlight.org>)
8. Straits Times (Singapore) The Web of Curiosity, August 25, 2007, Science section.
9. Straits Times (Singapore) When the laws of science aren't laws at all, April 12, 2009, Science section.
10. Straits Times (Singapore) See and listen to what others miss. December 20, 2009, Science section.
11. American Political Science Review, May 2009, cover photo
12. Sex: Motor der Evolution, Stuttgarter Beitrage zur Naturkunde, 2012 page 12

Web Publications: Science

1. The Guarded Receptor Model: How it all got started, where we are and where we are going. <http://frank.itlab.us/guarded.html>
2. Understanding the vulnerable period and spiral wave initiation: <http://frank.itlab.us/sample.html>
3. A model of how drugs increase the rate of sudden cardiac death. <http://frank.itlab.us/vp.html>
4. (with E.A. Stead) Thoughts of a medical educator and his engineer. http://frank.itlab.us/stead/info_age.html
5. Restoring the joy of learning (with E. A. Stead). <http://frank.itlab.us/stead/joy.html>

Publications: Books, Proceedings of Professional Meetings, Abstracts

1. Starmer, CF, Artley, JL, Weinberg, DI, and Whalen, RE: An electric shock hazard in cardiology. IEEE Conference Paper. C.P. 63:649, 1962.
2. Starmer, CF: A multivariate analysis program for biomedical research. Proc. S. E. Regional ACM Meeting, Vol. 3, 1967.
3. Starmer, CF and Whalen, RE: Electrical hazards in a medical environment. Proc. Symposium on New Electrical Hazards in Hospitals. Ottawa, pp. 45-52, 1967.
4. Rosati, RA, Simon, SB, Ripperton, LA, Starmer, CF and Wallace, AG: Medical Interactive Data System: Prognostic stratification of patients with acute myocardial infarction. Proc. San Diego Biomedical Symp., pp.179-183, 1971.
5. McAnulty, MA, Starmer, CF and Kong, Y: Computer-aided measurement of coronary arterial trees. Proc. Computer Image Processing and Recognition, 1:1-3-1, 1-3-6, 1972.
6. Whalen, RE and Starmer, CF: Electrical hazards related to instrumentation, in *Textbook of Coronary Care*. Excerpta Medica, Amsterdam: 744-762, 1972.
7. Starmer, CF and Smith, WM: Problems in acquisition and representation of coronary arterial trees. Computers in Cardiology, (IEEE, Long Beach, California), pp. 143-148, 1974
8. Sperling, O, Wyngaarden, JB and Starmer, CF: The kinetics of intramolecular distribution of ^{15}N in Uric acid following administration of ^{15}N Glycine: Preferential labeling of N-(3+9) in Uric acid in primary gout and a reappraisal of the "Glutamine Hypothesis", in O. Sperling, A. De Vries, and J.B. Wyngaarden (ed.), *Purine Metabolism in Man*, Plenum Press, New York, 41B: 371-392, 1974.
9. Starmer, CF, McIntosh, HD and Whalen, RE: Electrical hazards in cardiovascular function. *Electrical Safety & Hazards in Hospitals*, MSS Information Corporation, New York, pp. 132-143, 1974.
10. Starmer, CF and Smith, WM: Computer storage and retrieval of coronary trees. In *Cardiovascular Imaging and Image Processing: Theory and Practice - 1975*. The Society of Photo-optical Instrumentation Engineers, Palos Verdes Estates, California, Vol. 72:195-199, 1975.
11. Mittler, BS, Lee, KL, Starmer, CF and Rosati, RA: Machine-based aids for managing patients with chronic illnesses. Proceedings of the Second Illinois Conference on Medical Information Systems, Instrument Society of America, Pittsburgh, pp.49-55, 1976.
12. Starmer, F: Role of automatic data processing in clinical research. Methodologies and Protocols in Clinical Research: Evaluating Environmental Effects in Man (EPA Conference Proceedings), pp. 103-107, 1978. (Invited paper.)
13. Wallace, AG, Rosati, RA, Stead, EA, Jr. and Starmer, CF: A computer system for closing the loop between interventions and outcome in chronic illnesses. Proc. 8th World Congress of Cardiology, pp. 1076-1080, 1978.
14. Starmer, CF: Computational tools for statistical data analysis. In *Studies in Computer Science* edited by SV Pollack (series: Studies in Mathematics), Prentice-Hall, Englewood Cliffs, 1982.
15. Starmer, CF, Lee, KL, Harrell, FE and Rosati, RA: A database approach for stabilizing clinical decisions in the setting of chronic illness. Proceedings of the Third Annual Symposium on Computer Applications in Medical Care, IEEE Computer Society, Long Beach, California, pp.777-786, 1979. (Invited paper.)
16. Starmer, CF: Functional decomposition of clinical database systems. Proceedings of the Sixth Illinois Conference on Medical Information Systems, pp. 215-221, 1980. (Invited paper.)
17. Starmer, CF, Smith, DAH, Wells, JS and Wright, BC: Problems in data management when studying chronic illness. Proceedings of the 14th International Conference on Systems Science, Vol. II, Section I, pp.144-151, 1981.
18. Starmer, CF and Wright, BC: Minimizing the impact of system timing constraints: experience with a microprocessor-based interface for supporting real time graphics data entry. Proceedings of the 1981 Real-Time Systems Symposium, pp. 89-94.
19. Beck, JW, Jaszczak, RJ, Coleman, RE, Starmer, CF, and Nolte, LW: Analysis of SPECT using Monte Carlo simulation. Proceedings of the International Workshop on Physics and Engineering in Medical Imaging, Pacific Grove, California, March 15-18, 1982.

20. Beck, JW, Jaszczak, RJ, Starmer, CF: The effect of Compton scattering on quantitative spect imaging. Proceedings of the Third World Congress of the World Federation of Nuclear Medicine in Biology, Paris, 1982.
21. Bowyer, K, Hedlund, L, Vock, P, Gerard, D, Effman, E, Starmer, F: Computer analysis of CT scan images for tissue densitometry. Proceedings of the Application of Optical Instrumentation in Medicine X, Volume 347, New Orleans, May 1982.
22. Starmer, CF, Grant, AO, Strauss, HC: A model of interaction of local anesthetics with Na channels. *Biophys J* 41:145a, 1983. Abstract from the 27th Annual Meeting of the Biophysical Society, San Diego, February, 1983.
23. Grant, AO, Starmer, CF and Strauss, HC: A model for the voltage dependent interaction of antiarrhythmic drugs with cardiac sodium channels. *Clinical Research* 31:460A, 1983.
24. Starmer, CF, Grant, AO, and Strauss, HC: A mechanism of apparent voltage dependence of local anesthetic affinity for Na channels. *Circulation* 68, III:295, 1983.
25. Starmer, CF, Grant, AO, and Strauss, HC: Mechanisms of apparent
26. variation of local anesthetic affinity for ionic channel binding site. *Biophys J* 45:287a, 1984. Abstract from the 28th Annual Meeting of the Biophysical Society, San Antonio, February, 1984.
27. Starmer, CF: Feedback stabilization of control policy selection in data/knowledge based systems. *IEEE COMPDEC Proceedings*, Los Angeles, 1984, pp. 586-591.
28. Grant, AO, Starmer, CF: Voltage dependent mechanisms of closure of unitary sodium channels of rabbit. *Circulation*, 1984.
29. Strauss, HC, Broughton, A, Starmer, CF and Grant, AO: pH potentiation of local anesthetic action in heart muscle. In *Cardiac Electrophysiology and Arrhythmias*, Grune and Stratton, 1985.
30. Starmer, CF: Exploring cardiovascular structure and function with a digital computer. In *The Heart and Cardiovascular System - Scientific Foundations*, ed: Fozzard, HM, Haber, E, Jennings, RB, Katz, AM, and Morgan, HE. Raven Press, New York, 1986.
31. Starmer, CF, Yeh, JZ and Tanguy, J: A quantitative description of QX222 blockade of sodium channels in squid axons. *J Gen Physiol*, December, 1985.
32. Packer, DL, Grant, AO, Strauss, HC, Starmer, CF: Quantitative determination of recovery kinetics from use-dependent drug uptake: A test of the guarded receptor hypothesis. *Circulation* 74(II), p. II-20, October, 1986.
33. Hurwitz, JL, Starmer, CF, Dietz, MA, Grant, AO: Sodium channel inactivation from closed states. *Circulation* 74(II), p. II-19, October, 1986.
34. Packer, DL, Grant, AO, Strauss, HC, Starmer, CF: Determination of apparent binding affinities from use-dependent conduction delay and V_{max} reduction in Purkinje fibers. *Circulation* 74(II), p. II-253, October, 1986.
35. Grant, AO, Yee, R, Brown, KK, Starmer, CF: A transient outward potassium current in canine cardiac Purkinje cells. *Circulation* 74(II), p. II-254, October, 1986.
36. Starmer, CF, Grant, AO, Packer, DL: A macroscopic characterization of use-dependent ion channel blockade. *Biophys. J.* 51:8a, 1987.
37. Starmer, CF: Characterizing synaptic plasticity with an activity dependent model. Proceedings of the IEEE International Conference on Neural Networks, San Diego, CA, June 21-24, 1987.
38. Starmer, CF, Nesterenko, VV, Undrovinas, IA, Packer, DL, Gilliam, FR, Grant, AO, Rosenshtraukh, LV and Strauss, HC. Characterizing ion channel blockade with the guarded receptor hypothesis. *Molecular and Cellular Mechanisms of Antiarrhythmic Agents*. ed. L. Hondeghem, pp 179 - 200. Futura, Mt. Kisco NY, 1989.
39. Spach, MS, Dolber, PC, Heidlage, JF, and Starmer, CF Influence of Non-Tissue On Normal and Abnormal Conduction. *Molecular Cellular Mechanisms of Antiarrhythmic Agents*. ed. L. Hondeghem, pp 45 - 72. Futura, Mt. Kisco, NY, 1989. Jun 19-23, 1988.
40. Lastra, AA, Starmer, CF. POET: A Tool for the Analysis of the Performance of Parallel Algorithms. Proceedings of the 1988 International Conference on Parallel Processing.
41. Starmer, CF, Gilliam, FR, Nesterenko, VV and Grant, AO. Drug induced shifts in measures of channel availability do not necessarily reflect modified gating kinetics. *Biophys J* 55:246a, 1989.
42. Gilliam, F, Rivas, P, Whitcomb, D, Starmer, F, and Grant, A. Lidocaine reversal of marked QRS abnormalities and sodium channel blockade by propoxyphene. *Circulation* 80:II-605, 1989.
43. Starmer, F, Barber, M, Rivas, P, and Grant, A. Do tonic and use-dependent blockade reflect a common process? *Circulation* 80:II-605, 1989.

44. Barber, M, Starmer, F, and Grant, A. Dilantin reversed sodium channel blockade with amitriptyline by allosteric modulation of a channel receptor site. *Circulation* 80:II-135, 1989.
45. Gilliam, F, Rivas, P, Starmer, F and Grant A. External pH modulates the block of both calcium and sodium channels by nifedipine. *Circulation* 80:II-136, 1989.
46. Grant, A, Dietz, M, and Starmer, F. Voltage-dependent block of single cardiac sodium channels by disopyramide. *Circulation* 80:II-136, 1989.
47. Grant, AO, Dietz, MA, Gilliam, FR and Starmer, CF. Mechanisms of blockade of cardiac sodium channels by antiarrhythmic drugs: New insight from current experimental approaches. *Current topics in Antiarrhythmic agents*, Excerpta Medica, Ltd. Tokyo, 1989. pp 57-64.
48. Barber, MJ, Starmer, CF and Grant, AO. Slow blockade of the cardiac sodium channel by dilantin: single channel analysis. *Circulation* 82:III-11, 1990.
49. Barber, MJ, Starmer, F and Grant, AO. Muscarinic modulation of kinetics of block of rabbit atrial sodium channels by lidocaine. *Circulation* 82: III-342, 1990.
50. Barber, MJ, Starmer, CF and Grant, AO. Changes in external sodium concentration do not affect recovery kinetics or steady-state block of rabbit atrial sodium channels during exposure to lidocaine. *Circulation* 82:III-526, 1990.
51. Wendt, DJ, Merrill, JJ, Starmer, CF and Grant, AO. Do lidocaine-associated sodium channels conduct? *Circulation* 84:II-174, 1991.
52. Wendt, DJ, Starmer, CF and Grant, AO. Interaction of the metabolite glycylylidide with the cardiac sodium channel: Additive blockade with lidocaine. *Circulation* 84:II-175, 1991.
53. Liu, L, Wendt, DJ, Starmer, CF and Grant, AO. Block of the transient outward current in rabbit atrial myocytes by quinidine: Lack of voltage and frequency dependence. *Circulation* 84:II-180, 1991.
54. Starmer, CF, Lancaster, AR, Lastra, AA and Grant AO. Slowly unbinding sodium channel antagonists promote arrhythmic responses to premature stimulation. *Circulation* 84:II-324, 1991.
55. Starmer, CF, Krinsky, VI, Tong, FC, Romashko, DN, Aliev, RR, Burashnikov, A and Stepanov, MR. Role of channel blockade in promoting the initiation of rotating vortices in Cardiac Muscle. *Computers in Cardiology*, 55-58, 1992.
56. Young, T and Starmer, CF. Minimal cellular automata model of cardiac cells: initiation of reentrant activation from a single stimulation site. *Computers in Cardiology*, 419-422, 1992.
57. Krinsky, VI, Burashnikov, A, Efimova, T, Mikhaliuk, ER, Tong, FC and Starmer, CF. "Analysis of Cardiac Vulnerability to Stimulus Current and Electrode Configuration: Theoretical and Experimental Studies". *Proc. of the Int. Conf. "Future directions of nonlinear dynamics in biology and physics"*. Copenhagen, 1992.
58. Starmer, CF, Krinsky, VI, Romashko, DN and Aliev, RR. "Pulse chemistry of vortices suppression in cardiac muscle". p254-256 in *Spatio-Temporal Organization in Nonequilibrium Systems*. Ed. Mueller, SC and Plesses, R Verlag, Dortmund, 1992.
59. Starmer, CF. Modelling cardiac reentrant arrhythmias. *Proceedings of the Second BIOMEDEA Symposium: Experimental Techniques in Medical Physiology*. IIT-Bombay, Powai, Bombay, India, 1994. (Invited paper.)
60. Starobin, JM, Zilberter, YI and Starmer, CF. Unexcitable zones as a source of spiral wave initiation and cardiac arrhythmias. *Proc. 16th IEEE Eng in Med and Biol*. pp.5-6, 1994
61. Starmer, CF, Wendt, DJ, Grant, AO, Starobin, J and Zilberter, Y. Torsade de pointes: an anti- or proarrhythmic response to K channel block. *Circulation* 90: I-518, 1994.
62. Zilberter, YI, Starmer, CF, Starobin, J and Grant, AO. Background sodium current and electrical instabilities in cardiac cells. *Biophysical Journal* 68:A158, 1995.
63. Starobin, JM, Zilberter, YI and Starmer, CF. Conditions for wavefront separation from an unexcitable obstacle in cardiac tissue of low excitability. *Proc. 17th IEEE Eng in Med and Biol*. 1995.
64. Starmer, CF, Spach, MS and Grant, AO. Cellular coupling: a generic mechanism for converting a cellular antiarrhythmic process to a multicellular proarrhythmic process. *Pacing and Clinical Electrophysiol*. 18:839, 1995
65. Dietz, MA, Ellis, CS and Starmer, CF. Clock instability and its effect on time intervals in performance studies. *CMG95 Proceedings*. Dec. 1995, 439-448.
66. Starmer, CF and Starobin, J. Anti- and Proarrhythmic Mechanisms in Cardiac Tissue: Linking Spiral Waves, Reentrant Arrhythmias and Electrocardiographic Patterns, in "Discontinuous Propagation and Cardiac Arrhythmias" edited by Spooner, P. Futura Press, 1996.

67. Cimponeriu, A., Starmerf, C.F., Bezerianos, A. Action potential propagation in ischemic cardiac tissue: A theoretical computer model, *Computers in Cardiology*, IEEE Inc. Cleveland Ohio, 25:317-320, 1998
68. Cimponeriu, A., Starmer, C. F. and Bezerianos, A. Action potential propagation in the ischemic myocardium: a theoretical computer model. *Proc. Symposium on electronics and telecommunications*. 1998. IEEE Inc. Vol 2, Timisoara, 154-158.
69. Cimponeriu, A. Starmer, C.F. and Bezerianos, A. Modeling of ventricular tissue and ecg reconstruction in acute and chronic ischemia. *Computers in Cardiology*. IEEE Inc. Hannover Germany 26:503-506, 1999.
70. Componeriu, A., Starmer, C.F. and Bezerianos, A. Antiarrhythmic drugs effect analysis on a model of cardiac fiber. *Computers in Cardiology*, IEEE Inc. Boston Mass. Sept 2000.
71. Starmer, C. F. Initiating a propagating wave: from excitation to spirals. 18th Annual Computational Neuroscience Meeting, Berlin, July 2009

Publications: Articles

1. Weinberg, DI, Artley, JL, Whalen, RE, McIntosh, HD and Starmer, CF: Electric shock hazards in cardiology. *IRE Trans. Biomed. Elect.*, BME 9:244, 1962.
2. Thompson, HK, Starmer, CF, Whalen, RE and McIntosh, HD: Indicator transit time considered a gamma variate. *Circ. Res.* 14:502-515, 1964.
3. Whalen, RE, Starmer, CF and McIntosh, HD: Electrical hazards associated with cardiac pacemaking. *Ann. N.Y. Acad. Sci.* 111:922-931, 1964.
4. Starmer, CF, Whalen, RE and McIntosh, HD: Hazards of electric shock in cardiology. *Am. J. Cardiol.* 14:537-546, 1964.
5. Barry, WP, Starmer, CF, Whalen, RE and McIntosh, HD: Electric shock hazards in radiology departments. *Am. J. Roent. Ther. & Nucl. Med.* 95:976, 1965.
6. Pilkington, T, Starmer, CF and Boineau, J: On the electrocardiographic field equation. *Bull. Math. Biophys.* 27:493, 1965.
7. Fuson, R, Saltzman, HA, Starmer, CF and Smith, WW: Nomograms for oxygen content, saturation and pressure at hyperbaric conditions. *Anesthesiology* 27:176, 1966.
8. McIntosh, HD, Starmer, CF and Whalen, RE: A comparison of the ventricular fibrillation threshold with and without anesthesia. *Am. Heart J.* 72:419, 1966.
9. Starmer, CF, Whalen, RE and McIntosh, HD: Determination of leakage currents in medical equipment. *Am. J. Cardiol.* 17:437, 1966.
10. Whalen, RE and Starmer, CF: Electric shock hazards in clinical cardiology. *Mod. Concepts of Cardiovasc. Dis.* 36:7, 1967.
11. Starmer, CF and Grizzle, JE: A computer program for analysis of data by general linear models. *UNC Inst. Statistics Mimeo Series*, No. 560, 1968.
12. Grizzle, JE, Starmer, CF and Koch, GG: Analysis of categorical data by linear models. *Biometrics* 25:489-504, 1969.
13. Forthofer, RN, Starmer, CF and Grizzle, JE: A program for the analysis of categorical data by linear models. *UNC Inst. Statistics Mimeo Series*, No. 604, 1969.
14. Harley, A, Starmer, CF and Greenfield, JC: Pressure-flow studies in man: An evaluation of the duration of the phases of systole. *J. Clin. Invest.* 48:895, 1969.
15. Starmer, CF and Clark, DO: Computer computations of cardiac output using the gamma function. *J. Appl. Phys.* 28:219, 1970.
16. Ramo, BW, Myers, N, Wallace, AG, Starmer, CF, Clark, DO and Whalen, RE: Hemodynamic findings in 123 patients with acute myocardial infarction on admission. *Circ.* 42:567, 1970.
17. Starmer, CF, McIntosh, HD and Whalen, RE: Electric hazards and cardiovascular function. *New Eng. J. Med.* 284:181, 1971.

18. Greenfield, JC, Starmer, CF and Walston, A: Measurement of aortic blood flow in man by the computed pressure derivative method. *J. Appl. Physiol.* 31:792-795, 1971.
19. Forthofer, RN, Starmer, CF and Grizzle, JE: A program for the analysis of categorical data by linear models. *J. Biomedical Systems*, 2:3-48, 1971.
20. Starmer, CF, Rosati, RA and Simon, SB: Interactive acquisition and analysis of discrete data. *Comp. Biomed. Res.* 5:505-514, 1972.
21. Starmer, CF: A nonparametric general linear model. *Comp. Biomed. Res.* 5:608-612, 1972.
22. Davidson, RM, Ramo, BW, Wallace, AG, Whalen, RE and Starmer, CF: Blood gas and hemodynamic responses to oxygen in acute myocardial infarction. *Circ.* 47:704-711, 1973.
23. Starmer, CF and Whalen, RE: Role of current density in electrically induced ventricular fibrillation. *Medical Instrumentation* 7:158-161, 1973.
24. Starmer, CF, McHale, PA and Greenfield, JC: Processing of arterial pressure waves with a digital computer. *Comp. Biomed. Res.* 6:90-96, 1973.
25. Wyngaarden, JB, Sperling, O and Starmer, CF: A reappraisal of the concept of an abnormality of glutamine metabolism in primary gout. *Trans. Amer. Clin. and Clim. Soc.* 84:166-182, 1973.
26. Starmer, CF, McHale, PA, Cobb, F and Greenfield, JC: Evaluation of several methods for computing stroke volume from central aortic pressure. *Circ. Res.* 33:139-140, 1973.
27. Sperling, O, Wyngaarden, JB and Starmer, CF: The kinetics of intramolecular distribution of ¹⁵N in uric acid after administration of [¹⁵N]Glycine. *J. Clin. Invest.* 52:2468-2485, 1973.
28. Starmer, CF, Rosati, RA and McNeer, JF: Data bank use in the management of chronic disease. *Comp. Biomed. Res.* 7:111-116, 1974.
29. McNeer, JF, Starmer, CF, Bartel, AG, Behar, VS, Kong, Y, Peter, RH and Rosati, RA: The nature of treatment selection in coronary artery disease: Experience with medical and surgical treatment of a chronic disease. *Circ.* 49:606-614, 1974.
30. Starmer, CF, Rosati, RA and McNeer, JF: A comparison of frequency distributions for use in a model for selecting treatment in coronary artery disease. *Comp. Biomed. Res.* 7:278-293, 1974.
31. Starmer, CF, Grizzle, JE and Sen, PK: Comment on some reasons for not using the Yate's continuity correction of 2x2 contingency tables. *J. Amer. Stat. Assoc.* 69:376-378, 1974.
32. McNeer, JF, Conley, MJ, Starmer, CF, Behar, VS, Kong, Y, Peter, RH, Bartel, AG, Oldham, HN, Young, WG, Sabiston, DC and Rosati, RA: "Complete" and "Incomplete" revascularization at aorto-coronary bypass surgery: Experience with 392 consecutive patients. *Amer. Heart J.* 88:176-182, 1974.
33. Starmer, CF, Sperling, O and Wyngaarden, JB: A kinetic model for the intramolecular distribution of ¹⁵N in uric acid in patients with primary gout fed ¹⁵N glycine. *Mathematical Biosciences* 25:105-123, 1975.
34. McNeer, JF, Wallace, AG, Wagner, GS, Starmer, CF and Rosati, RA: The course of acute myocardial infarction: Feasibility of early discharge of the uncomplicated patient. *Circ.* 51:410-413, 1975.
35. Starmer, CF and Rosati, RA: Computer based aid to managing patients with chronic illness. *IEEE Computer* 8: No. 1:46-50, 1975.
36. Rosati, RA, McNeer, JF, Starmer, CF, Mittler, BS, Morris, JJ and Wallace, AG: A new information system for medical practice. *Arch. Int. Med.* 135:1017-1024, 1975.
37. Roe, CR and Starmer, CF: A sensitivity analysis of enzymatic estimation of infarct size. *Circ.* 52:1-5, 1975.
38. Starmer, CF and Smith, WM: Problems in acquisition and representation of coronary arterial trees. *IEEE Computer* 8: No. 7:36-41, 1975.
39. Margolis, JR, Hirshfeld, JW, McNeer, JF, Starmer, CF, Rosati, RA, Peter, RH, Behar, VS and Kong, Y: Sudden death due to coronary artery disease. *Circ., Supp.*(3). 52:180-183, 1975.
40. Starmer, CF and Lee, KL: A mathematical approach to decisions: Application of Bayes rule to a mixture of continuous and discrete clinical variables. *Comp. and Biomed. Res.* 9:531-541, 1976.
41. Roe, CR, Starmer, CF and Cobb, FR: Mathematical models fail to improve CPK estimates of extent of infarct. Letter to the Editor, *Circ.* 55, No.4:678-679, 1977.
42. Roe, CR, Cobb, FR and Starmer, CF: The relationship between enzymatic and histologic estimates of the extent of myocardial infarction in conscious dogs with permanent coronary occlusion. *Circ.* 55:438-449, 1977.
43. Starmer, CF and Rosati, RA: A decision support system for managing patients with a chronic illness. *Database* 8:51-57, 1977.

44. Moses, MJ, Slatton, GH, Gambling, GM and Starmer, CF: Synaptonemal complex karyotyping in spermatocytes of the chinese hamster (*Cricetulus Griseus*). *Chromosoma* 60:345-375, 1977.
45. Smith, WM and Starmer, CF: Error propagation in quantitative biplane cinerentgenography. *Phys. in Med. and Bio.* 23, No.4:677-685, 1978.
46. Ideker, RE, Behar, VS, Wagner, GS, Starr, JW, Starmer, CF, Lee, KL and Hackel, DB: Evaluation of asynergy as an indicator of myocardial fibrosis. *Circ.* 57:715-725, 1978.
47. Lee, KL, McNeer, JF, Starmer, CF, Harris, PJ and Rosati, RA: Clinical judgment and statistics: Lessons from a simulated randomized trial in coronary artery disease. *Circ.* 61:508-515, 1980.
48. Starmer, CF, Lee, KL, Harrell, FE and Rosati, RA: On the complexity of investigating chronic illness. *Biometrics* 36, No.2:333-335, 1980.
49. Feussner, JR, Linfors, EW, Blessing, CL, Starmer, CF: Computed tomography brain scanning in alcohol withdrawal seizure: Value of the neurological examination. *Annals of Int. Med.*, Vol. 94, No.4:519-522, 1981.
50. Starmer, CF, Smith, DAH, Wells, JS and Wright, BC: Problems in data management when studying chronic illness. *J. Biomed. Sys.*, Vol. 5, No. 4:271-280, 1981.
51. Starmer, CF: A recursively interpreted data structure for representing clinical entities. *J. Biomed. Sys.*, Vol. 6, No. 2:183-196, 1982.
52. Starmer, CF and Lee, KL: A data based approach to assessing clinical interventions in the setting of chronic disease. *Cancer Treatment Reports* 66:1077-1082, 1982.
53. Bowyer, KW and Starmer, CF: A simulation-based sensitivity study of radionuclide angiographic approaches to shunt assessment. *Computers and Biomedical Research* 15:111-128, 1982.
54. Beck, JW, Jaszczak, RJ, Coleman, RE, Starmer, CF, and Nolte, LW: Analysis of SPECT including scatter and attenuation using sophisticated Monte Carlo modeling methods. *IEEE Trans Nucl Sci NS-29:506-511*, February 1982.
55. Bowyer, KW, and Starmer, CF: Optimizing contiguous-element region selection for virtual memory systems. *IEEE Trans. on Computing -Image Processing and Computer Architecture* Vol. C-32, No. 12, pp.1201-1203, December, 1983.
56. Bowyer, KW, Starmer, CF, and Dubois, P: Error sensitivity of CT-guided stereotaxis. *Computers and Biomedical Research* 15:272-280, 1982.
57. Hla, KM, Feussner, JR, Blessing-Feussner, CL, Neelon, FA, Linfors, EW, Starmer, CF, and McKee, PA: Improvement of blood pressure control in university medical clinic by use of a physician's associate. *Arch Int Med* 143:920-923, May 1983.
58. Linfors, EW, Feussner, JR, Blessing, CL, Starmer, CF, Neelon, FA, and McKee, PA: Spurious hypertension in the obese patient-effect of sphygmomanometer cuff size on prevalence of hypertension. *Arch Int Med* 144:1482-1485, 1984.
59. Grant, AO, Starmer, CF, and Strauss, HC: Unitary sodium channels in isolated cardiac myocytes of rabbit. *Circ Res* 53:823-829, 1983.
60. Starmer, CF, Grant, AO, and Strauss, HC: Mechanisms of use-dependent block of sodium channels in excitable membranes by local anesthetics. *Biophys. J.* 46:15 -27, 1984.
61. Wenger, TL, Lederman, S, Starmer, CF, Brown, T, Strauss, HC: A method for quantitating antifibrillatory effects of drugs following canine coronary reperfusion: improved outcome with bretylium. *Circulation* 69(1):142-148, 1984.
62. Broughton, A, Grant, AO, Starmer, CF, Klinger, JK, Stambler, BS, and Strauss, HC: Lipid solubility modulates pH potentiation of local anesthetic block of Vmax reactivation in Guinea pig myocardium. *Circ Res* 55:513-523, 1984.
63. Grant, AO, Starmer, CF, and Strauss, HC: Antiarrhythmic drug action: Blockade of the inward sodium current. *Circ Res* 55:427-439, 1984.
64. Starmer, CF and Hollett, MD: Mechanisms of apparent affinity variation of guarded receptors. *J. Theor. Biol.* 115:337-349, 1985.
65. Starmer, CF and Grant, AO: Phasic ion channel blockade: A kinetic model and method for parameter estimation. *Molecular Pharmacology* 28:348-356, 1985.
66. Starmer, CF and Kerr, RB: Simulation of use-dependent uptake of ion channel blocking agents by excitable membrane. *IEEE Trans. on Biomed. Eng. BME-* 32(10):770-774, 1985.
67. Starmer, CF, Dietz, MA and Grant, AO: Signal discretization: A source of error in histograms of ion channel events. *IEEE Trans. on Biomed. Eng. BME-33(1):70-73*, 1986.

68. Starmer, CF, Yeh, JZ and Tanguy, J: A quantitative description of QX222 blockade of sodium channels in squid giant axon. *Biophys. J.* 49:913-920, 1986.
69. Starmer, CF: Theoretical characterization of ion channel blockade: Ligand binding to periodically accessible receptors. *J. Theor. Biol.* 119:235-249, 1986.
70. Moorman, JR, Yee, R, Bjornsson, T, Starmer, CF, Grant, AO and Strauss, HC: pKa does not predict pH potentiation of sodium channel blockade by lidocaine and W6211 in guinea pig ventricular myocardium. *J. Pharm. Exp. Therap.* 28(1):159-166, 1986.
71. Starmer, CF and Courtney, KR: Modeling ion channel blockade at guarded binding sites: Application to tertiary drugs. *Amer. J. Physiol.* 251:H848-H856, 1986.
72. Starmer, CF, Cherveney, DJ, Dietz, MA and Smaltz, JM: Managing research data with self-documenting files. *Computers and Biomedical Research* 20:264-278, 1987.
73. Starmer, CF, Packer, DL and Grant, AO: Ligand binding to transiently accessible sites: Mechanisms for varying apparent binding rates. *J. Theor. Biol.* 124:335-341, 1987.
74. Starmer, CF. Characterizing activity-dependent processes with a piecewise exponential model. *Biometrics*, 44:549-559, 1988.
75. Grant, AO and Starmer, CF: Mechanisms of closure of cardiac sodium channels in rabbit ventricular myocytes: single channel analysis. *Circ. Res.* 60:897-913, 1987.
76. Starmer, CF: Theoretical characterization of ion channel blockade: competitive binding to periodically accessible receptors. *Biophys J.* 52:405-412, 1987.
77. Starmer, CF. Characterizing synaptic plasticity with an activity dependent model. In. M. Caudill and C. Butler (ds). *Proceedings of the ITTT First Intl. Conf. On Neural Networks* 4:3-10, 1987 San Diego, IEEE/ICNN.
78. Starmer, CF, Undrovinas, IA, Scamps, F, Vassort, G, Nesterenko, VV, and Rosenshtraukh, LV. Ethacizin blockade of Ca⁺⁺ channels: A test of the guarded receptor hypothesis. *Amer J. Physiol* 257:H1693-H1704, 1989.
79. Starmer, CF, Nesterenko, VV, Gilliam, FR and Grant, AO. Using ionic currents to identify and estimate parameters in models of channel blockade. *Amer. J. Physiol* 259:H626-H634, 1990.
80. Gilliam, FR, Starmer, CF and Grant AO. Blockade of rabbit atrial sodium channels by lidocaine: Characterization of continuous and frequency-dependent blocking. *Circulation Res* 65:723-739, 1989.
81. Packer, DL, Grant, AO, Strauss, HC and Starmer, CF. Characterization of concentration and use-dependent effects of quinidine from conduction delay and declining conduction velocity in canine purkinje fibers. *J. Clinical Invest.* 83:2109-2119, 1989.
82. Grant, AO, Dietz, MA, Gilliam, FR and Starmer, CF. Blockade of cardiac sodium channels by lidocaine: Single channel analysis. *Circ. Res.* 65:1247-1262, 1989.
83. Starmer, CF and Dietz, MA. Managing clinical research data: Software tools for hypothesis exploration. *Environmental Health Perspectives* 87:5-11, 1990.
84. Dietz, MA, Grant, AO and Starmer, CF. An object oriented user interface for analysis of biological data. *Computers and Biomedical Research* 23:82-96, 1990.
85. Starmer, CF, Nesterenko, VV, Undrovinas, AI, Grant, AO and Rosenshtraukh, LV. Lidocaine blockade of a transiently accessible site in cardiac sodium channels. *J. Mol. Cell Cardiol.* 23(suppl I):73-83,1991.
86. Whitcomb, DC, Gilliam, FR, Starmer, CF and Grant, AO. Marked QRS complex abnormalities and sodium channel blockade by propoxyphene reversed with lidocaine. *J. Clin. Invest.* 84:1629-1636, 1989.
87. Nesterenko, V, Anyukhovskiy, E, Starmer, C, Beloshapko, G, Ivanovoch, T, Bugrij, E, Mazaev, A and Rosenshtraukh, L. Effect of combination of two first class antiarrhythmic drugs on the conduction velocity through myocardium. *Kardiologiia*, 30:81-87, 1990 (in Russian).
88. Makielski, JC, Nesterenko, VV, Nelson, WL, Undrovinas, AI, Starmer, CF and Rosenshtraukh, LV. State dependence of ethacizin and ethmozin block of sodium current in voltage clamped and internally perfused cardiac Purkinje cells. *J. Pharm. Exp. Therp.* 253: 1110-1117, 1990.
89. Ware, RC, Scarce, RM, Dietz, MA, Starmer, CF, Palker, TJ and Haynes, BF Characterization of the surface topography and putative tertiary structure of the human CD7 molecule. *J.Immunology* 143:3632-3640, 1989.
90. Hurwitz, J, Dietz, MA, Starmer, CF, and Grant, AO. A source of bias in the analysis of single channel data: Assessing the apparent interaction between channel proteins. *Comp. Biomed. Res.* 24:584-602, 1991.
91. Nesterenko, VV, Anyukhovskiy, EP, Starmer, CF, Beloshapko, GG, Ivanovoch, T, Makielski, JC, Bugrij, EM, Mazaev, AV and Rosenshtraukh, LV. Modulating intraventricular conduction through competition of two class I

- antiarrhythmic agents: experience with ethacizin and lidocaine in canine heart. *J. Mol. Cell. Card* 23 (suppl. I) 115-124, 1991.
92. Colatsky, TJ, Follmer, CH and Starmer, CF. Channel specificity in antiarrhythmic drug action: mechanism of potassium channel block and its role in suppressing and aggravating cardiac arrhythmias. *Circulation* 82:2235-2242, 1990.
 93. Gilliam, FR, Rivas, PA, Wendt, DJ, Starmer, CF and Grant, AO. Extracellular pH modulates the block of both sodium and calcium channels by Nicardipine. *Am. J. Physiol.* 259:H1178-H1184, 1990.
 94. Undrovinas, AI, Burnashev, N, Eroshenko, D, Fleidervish, I, Starmer, CF, Makielski, JC and Rosenshtraukh, L. Quinidine blocks adenosine 5'-triphosphate-sensitive potassium channels in heart. *Amer. J. Physiol.* 259:H1609-H1612, 1990.
 95. Barber, JM, Starmer, CF and Grant, AO. Blockade of cardiac sodium channels by amitriptyline and diphenylhydantoin: Evidence for two use-dependent binding sites. *Circulation Research* 69:677-696, 1991.
 96. Starmer, CF, Lastra, AA, Nesterenko, VV and Grant, AO. A proarrhythmic response to sodium channel blockade: Theoretical model and numerical experiments. *Circulation* 84:1364-1377, 1991.
 97. Nesterenko, VV, Lastra, AA, Rosenshtraukh, LV and Starmer, CF. A proarrhythmic response to sodium channel blockade: Prolongation of the vulnerable period in guinea-pig ventricular myocardium. *J. Cardio. Pharm.* 19:810-820, 1992.
 98. Plonsey, R, Starmer, CF and Tipans, I. The quantitative investigation of the binding process of calcium blocking drugs in a sinoatrial node. *J. Theor. Biol.* 149:55-61, 1991.
 99. Wendt, DJ, Starmer, CF and Grant, AO. Kinetics of interaction of the lidocaine metabolite, Glycylxylidide with the cardiac sodium channel: Additive blockade with lidocaine. *Circulation Res* 70:1254-1273, 1992.
 100. Barber, MJ, Wendt, DJ, Starmer, CF and Grant, AO. Blockade of cardiac sodium channels: Competition between the permeant ion and antiarrhythmic drugs. *J. Clin. Invest.* 90:368-381, 1992.
 101. Starmer, CF, Lancaster, AR, Lastra, AA and Grant, AO. Cardiac instability amplified by use-dependent Na channel blockade. *Amer. J. Physiol* 262:H1305-1310, 1992.
 102. Starmer, CF. Frequency-dependent processes: a model for short-term memory. *J. Stat. Planning and Inf.* 33:99-10, 1992.
 103. Spach, MS, Heidlage, JF, Darken, ER, Hofer, E and Starmer, CF. Cellular V(max) reflects both membrane properties and the load presented by adjoining cells. *Amer. J. Physiol* 263:H1855-H1863, 1992.
 104. Wendt, DJ, Starmer, CF and Grant, AO. Recording cardiac sodium channel currents without time-dependent changes in kinetics. *Amer. J. Physiol.* 263:C1234-1240, 1992.
 105. Liu, L, Krinsky, VI, Grant, AO and Starmer, CF. The cardiac transient outward potassium current: A pulse chemistry model of frequency-dependent properties. *Amer. J. Physiol* 270:H386-H397, 1996.
 106. Wendt, DJ, Starmer, CF and Grant, AO. pH dependence of the kinetics and steady-state block of cardiac sodium channels by lidocaine: Role of the proton exchange reaction. *Amer. J. Physiol.* 264:H1588-H1598, 1993.
 107. Zilberter, YI, Starmer, CF and Grant, AO. Sodium Channel Blockade: Multiple rest states revealed by channel interactions with disopyramide and quinidine. *American J Physiol* 266:H2007-H2017, 1994.
 108. Starmer, CF, Biktashev, VN, Romashko, DN, Stepanov, MR, Makarova, ON and Krinsky, VI. Vulnerability in an excitable medium: Analytical and numerical studies of initiating unidirectional propagation. *Biophys J* 65:1775-1787, 1993.
 109. Grant, AO, Wendt, DJ, Zilberter, YI and Starmer, CF. Kinetics of interaction of disopyramide with the cardiac sodium channel: Fast dissociation from open channels at normal rest potentials. *J. Mem. Biol* 136:199-214, 1993.
 110. Starobin, J, Zilberter, YI and Starmer, CF. Vulnerability in one-dimensional excitable media. *Physica D* 70:321-341, 1994.
 111. Starmer, CF, Reddy, M R, Namasivayam, A and Singh, M. Potassium channel blockade amplifies cardiac instability: numerical studies of torsades de pointes. *Ind. J. Physiol. Pharm.* 38:259-266, 1994.
 112. Burashnikov, AU, Efimova, TB, Starmer, CF and Medvinsky, AB. Dose dependent pro- and antiarrhythmic effects of procainamide in an experimental model. *Kardiologia* 34:A53-55, 1994 (in Russian).
 113. Romashko, DN and Starmer, CF. Numerical experiments in a modified Beeler-Reuter cable: Initiating fast (Na) and slow (Ca) waves. *Chaos, Solitons and Fractals* 5:417-424, 1995.

114. Gomez-Gesteira, M, Fernandez- Garcia, G, Munuzuri, AP, Perez-Munuzuri, V, Krinsky, VI, Starmer, CF and Perez-Villar, V. Spiral formation in a Belousov-Zhabotinsky medium by premature reexcitation: vulnerability. *Int. J. Bifurc. and Chaos* 4:1193-1204, 1994.
115. Gomez-Gesteira, M, Fernandez-Garcia, G, Munuzuri, AP, Perez-Munuzuri, V, Krinsky, VI, Starmer, CF and Perez-Villar, V. Vulnerability in an excitable Belousov-Zhabotinsky medium: from 1 D to 2D. *Physica D* 76:359-368, 1994.
116. Chaylakhyan, LM, Starmer, CF, Aliev, RR, Medvinsky, AB. Novel approaches to science organization: The project "Lab without Walls". *The Herald of the Russian Academy of Sciences (Vestnik Akademii Nauk)*. 64:808-809, 1994 (in Russian).
117. Medvinsky, AB, Vasieva, OO, Gusev, AV, Kuz'min, SV, Tsyganov, MA, Starmer, CF and Ivanitsky, GR. From disorder to order: Space self-separation of Dictyostelium Discoideum cells depending on their chemotactic response. *Proc. Russ. Acad. Sci. (Doklady Akademii Nauk)*. 338:690-694, 1994 (in Russian).
118. Starmer, CF. Intellectual environment, technical resources and curiosity: elements for competitive research. *Ind. J. Physiol. Pharm.* 38:233-237, 1994.
119. Starmer, CF and Namasivayam, A. The role of curiosity in biomedical research. *Biomedicine* (in press) 1995.
120. Whalley, DW, Wendt, DJ, Starmer, CF, Rudy, Y and Grant, AO. Voltage- independent effects of extracellular K⁺ on Na⁺ current and phase 0 of the action potential in isolated cardiac myocytes. *Circ. Res.* 75:491-502, 1994.
121. Starmer, CF, Romashko, DN, Reddy, RS, Zilberter, YI, Starobin, J, Grant, AO and Krinsky, VI. A proarrhythmic response to potassium channel blockade: Numerical studies of polymorphic tachyarrhythmias. *Circulation*, 92:595-605, 1995.
122. Nesterenko, VV, Anyukhovskiy, EP, Bugrij, EM, Starmer, CF, Beloshapko, GG, Makielski, JC, Kuzmin, AV, Menshikov, MJ, Mazaev, AV and Rosenshtraukh, LV. Combination ethacizin and ethmozin treatment of resistant ventricular ectopy - Theoretical, experimental and clinical study. *J. Cardio. Pharm.* 23:501-508, 1994.
123. Mornev, OA, Aslanidi, OV, Chailakhyan, LM and Starmer, CF. Splitting of the backfront of a propagating pulse of excitation. *Biofizika* 41:191-197, 1996.
124. Zilberter, YI, Starmer, CF, Starobin, J and Grant, AO. Late Na channels in cardiac cells: L the physiological role of background Na currents. *Biophys. J.* 67:153-160, 1994.
125. Spach, MS and Starmer, CF. Altering the topology of gap junctions in nonuniform anisotropy: A major therapeutic target in atrial fibrillation. *Cardiov. Research* 30:336-344, 1995.
126. Starobin, JM, Zilberter, YI, Rusnak, EM and Starmer, CF. Wavelet formation in excitable cardiac tissue: The role of wave-front-obstacle interactions in initiating high frequency fibrillatory-like arrhythmias. *Biophysical J.* 70:581-594, 1996.
127. Starmer, CF and Starobin, J. Spiral tip movement: the role of repolarizing currents in polymorphic cardiac arrhythmias. *Int. J. Bifurcations and Chaos* 6:1909-1923, 1996.
128. Starobin, J, and Starmer, CF. Boundary layer analysis of waves propagating in an excitable medium: Medium conditions for wavefront-obstacle separation. *Phys. Rev. E* 54:430-437, 1996.
129. Kukushkin, NI, Sidorov, VY, Medvinsky, AB, Romashko, DN, Starmer, CF and Sarancha, DY. Slow excitation waves and mechanisms of polymorphic ventricular tachycardia in rabbit and ground squirrel right ventricular preparation. *Biofizika* 43:1043-1059, 1998 (in Russian).
130. Starmer, CF. The cardiac vulnerable period and reentrant arrhythmias: Targets for anti- and proarrhythmic processes. *PACE* 20 (part 2): 445-454, 1997.
131. Starobin, JM and Starmer, CF. A common mechanism links spiral wave meandering and wavefront-obstacle separation. *Phys. Rev. E* 55:1193-1196, 1997.
132. Grant, AO, John, JE, Nesterenko, VV, Starmer, CF and Moorman, JR. The role of inactivation in open channel block of the sodium channel. Studies with inactivation-deficient mutant channels. *Mol. Pharm.* 50:1643-1650, 1996.
133. Sarancha, DY, Medvinsky, AB, Kukushkin, NI, Sidorov, VV, Romashko, DN, Burashnikov, AY, Moskalenko, AV and Starmer, CF. A system for computer aided visualization of propagation of excitation waves in myocardium. *Biofizika* 42:502-507, 1997. (in Russian).
134. Starobin, JM, Starmer, CF and Starobin, AJ. Boundary-layer analysis of a spiral wave core: Spiral core radius and conditions for the tip separation from the core boundary. *Phys Rev E.* 56:R3757-R3760, 1997.

135. Chandra R, Starmer CF, Grant AO: Multiple effects of the KPQ deletion mutation on the gating of human cardiac sodium channels expressed in mammalian cells. *Am J Physiol.* 43:H1643-H1654, 1998.
136. Chandra R, Starmer CF, and Grant AO: Modulation of the wild type and KPQ deletion mutant human cardiac sodium channels by β adrenergic stimulation. *Cardiovascular Research* 42:490-502, 1999.
137. Bountis T, Bezerianos, T, and Starmer CF: Wavefront formation in an excitable medium by perturbation of solitary pulse solutions. *Progress of Theoretical Physics* 139:12-33, 2000 (supplement)
138. Ivashikina, N.V., Sokolov, O.A. and Starmer, C.F. Modeling nitrate absorption in maize seedlings: Deviations from the Michaelis-Menten model. *Agrochemistry* 7:10-17, 2000 (in Russian)
139. Cimponeriu, A., Starmer, C.F. and Bezerianos, A. A theoretical analysis of acute ischemia and infarction using ECG reconstruction on a 2D model of myocardium. *IEEE Trans. Biomedical Engrg* 48:41-54, 2001.
140. Grant, A.O., Keller, C., Carboni, M., Chandra, R. and Starmer, C.F. Antiarrhythmic drug blockade of inactivation-deficient cardiac sodium channels IFM/QQQ stably expressed in mammalian cells. *Biophysical J.* 79:3019-3035, 2000
141. Starmer, J.D., Wagner, C.L. and Starmer, C.F. Rapidly prototyping web accessible clinical tools: A case study of the creation of an interactive parenteral nutrition order for use in a neonatal intensive care unit. *Proceedings of the International Conference on Biomedical Engineering-2001.* Anna University, Chennai India, 233-236, 2001.
142. Starmer, C. F. How drugs increase the rate of sudden cardiac death. *Int. J. Bifurcations and Chaos* 12:1953-1968, 2002.
143. [Moskalenko, A.V., Kukushkin, N.I., Starmer, C.F., Deev, A.A., Kukushkina, K.N., and Medvinskii, A.B.](#) Quantitative analysis of variability of electrocardiograms typical for polymorphic arrhythmias. *Biofizika* 46:319-329, 2001.
144. [Grant, A.O., Neplioueva, V., Starmer, C.F., Memmi, M., Napolitano, C. and Priori, S.](#) Long QT, Brugada syndrome and conduction system disease linked to a single Na channel mutation. *J. Clin. Invest.* 110:1201-1209, 2002
145. [Cimponeriu, A., Starmer, C.F. and Bezerianos, A.](#) Ischemic modulation of the vulnerable period and the effects of pharmacological treatment of ischemia induced arrhythmias: Simulation study. *IEEE Trans. Biomedical . Engrg.* 50:168-177, 2003
146. [Starmer, C.F., Colatsky, T.J. and Grant, A.O.](#) What happens when cardiac Na channels lose their function? 1- Numerical studies of the vulnerable period in tissue expressing mutant channels. *Cardiovascular Research* 57:82-91, 2003.
147. [Starmer, C.F.](#) Hitting a moving target: Moving toward a compliance-driven patient record. *J. Amer. Med. Inform. Assoc.* 9:659-660, 2002.
148. [Starmer, C.F., Grant, A.O. and Colatsky, T.J.](#) What happens when cardiac Na channel function is compromised? 2- Numerical studies of the vulnerable period in tissue altered by drugs. *Cardiovascular Research* 57:1062-1071, 2003
149. [Carboni M, Zhang ZS, Neplioueva V, Starmer CF, Grant AO. Slow sodium channel inactivation and use-dependent block modulated by the same domain IV S6 residue. J Membr Biol. 207:107-17, 2005](#)
150. [Starmer, C. Frank The Role of Intrinsic and Induced Vulnerability in Electrically Induced Cardiac Arrhythmias. Journal of Cardiovascular Electrophysiology 17:1369-1370, 2006.](#)
151. [Starmer, C. Frank Initiation of Excitation Waves. Scholarpedia, p.8689, 2007. \(http://www.scholarpedia.org/article/Initiation_of_Excitation_Waves\)](#)
152. [Starmer, C. Frank Vulnerability of Cardiac Dynamics. Scholarpedia, p.24753, 2007. \(http://www.scholarpedia.org/article/Vulnerability_of_Cardiac_Dynamics\)](#)
153. [Ha TC and Starmer F. Investigative Methods and Tools: Developing an integrated approach to critical thinking, evidence-based medicine and biostatistics. SGH Proceedings. 17: 160-163, 2008](#)
154. [Starmer, C. Frank Exploring reentrant arrhythmias with numerical experiments: Generic properties and model complexity. J. Cardiovascular Electrophysiology 20:684-688 2009](#)

155. Cardona K, Trenor B, Molto G, Martinez M, Ferrero Jr JM, Starmer F and Saiz J Exploring the role of pH in modulating the effects of lidocaine in virtual ischemic tissue. *Am J Physiol Heart Circ Physiol* 299:H1615-H1624 2010
156. Kamei, RK, Cook, S, Puthuchery, J and Starmer, CF. 21st century learning in medicine: Traditional teaching versus Team-based learning. *Medical Science Educator*, 22(2) April 2012.