

Suresh H. Moolgavkar, M.D., Ph.D.
**Corporate Vice President and Director of the Center for Epidemiology, Biostatistics, and
Computational Biology**

Professional Profile

Dr. Suresh Moolgavkar has more than 30 years of experience in the fields of epidemiology, biostatistics, and quantitative risk assessment. He is internationally known for his work in developing mechanistically based dose-response models for carcinogenesis, and, in particular, for the two-mutation clonal expansion model, also known as the Moolgavkar-Venzon-Knudson (MVK) model. For the past decade, Dr. Moolgavkar has also been keenly interested in air pollution epidemiology. Dr. Moolgavkar retired from his position as a Full Member of the Fred Hutchinson Cancer Research Center in August 2008. He continues to be an Affiliate Investigator at the Center and Professor of Epidemiology and Adjunct Professor of Applied Mathematics at the University of Washington in Seattle. Dr. Moolgavkar has served on the faculties of Johns Hopkins University, Indiana University, University of Pennsylvania, and Fox Chase Cancer Center. He has been a visiting scientist at the Radiation Effects Research Foundation in Hiroshima, the International Agency for Research on Cancer in Lyon, and the German Cancer Research Center in Heidelberg. Dr. Moolgavkar has served on numerous review panels and as a consultant to the National Cancer Institute, EPA, Health and Welfare, Canada, The International Agency for Research on Cancer (IARC), the California Air Resources Board (CARB), and the CIIT Centers for Health Research, among others.

Dr. Moolgavkar is the author or co-author of more than 150 papers and contributed chapters in the areas of epidemiology, biostatistics, and quantitative risk assessment, and has edited three books in these areas. He was the senior editor of a monograph, *Quantitative Estimation and Prediction of Human Cancer Risk*, published by the International Agency for Research on Cancer. He is an elected member of the American Epidemiological Society. Dr. Moolgavkar has served on the editorial boards of *Genetic Epidemiology* and *Inhalation Toxicology*, and is currently Associate Editor for Health and Environment of *Risk Analysis—An International Journal*. Dr. Moolgavkar has published numerous epidemiological and toxicological papers on lung cancer, including lung cancer following radiation and exposure to fibers. Dr. Moolgavkar was a member of the working group involved in the writing of the IARC monograph on tobacco smoking in 1986 (IARC monograph 38).

Dr. Moolgavkar was given the Founders' Award by the CIIT Centers for Health Research in 1990 and the Distinguished Achievement Award by the Society for Risk Analysis in 2001. He is an elected member of the American Epidemiological Society and a Fellow of the Society for Risk Analysis, the premier international organization for risk assessment.

Dr. Moolgavkar's research has been supported largely by grants from the National Institutes of Health, the U.S. Department of Energy, and EPA.

Academic Credentials and Professional Honors

Senior Fellow, Department of Epidemiology, University of Washington, 1976–1977
Ph.D., Mathematics, Johns Hopkins University, Baltimore, Maryland, 1973
Postdoctoral Fellow, Departments of Pharmacology and Biophysics, Johns Hopkins Medical School, Baltimore, Maryland, 1966–1968
M.B.B.S., (M.D.) Bombay University, 1965

Elected Member, American Epidemiological Society
Distinguished Achievement Award, Society for Risk Analysis, 2001
Founders' Award, Chemical Industry Institute of Toxicology, 1990
Lester R. Ford Award of Mathematical Association of America, 1977
Faculty Research Fellowship of Indiana University, 1974–1976

Academic Appointments

Professor, Department of Epidemiology, University of Washington, 1984–present
Adjunct Professor, Department of Biostatistics, University of Washington, 1984–2009
Adjunct Professor, Department of Applied Mathematics, University of Washington, 2004–present
Member, The Fred Hutchinson Cancer Research Center, Seattle, 1984–2008
Affiliate Investigator, The Fred Hutchinson Cancer Research Center, 2008–present
Member, Graduate Faculty, University of Washington, 1984–present
Adjunct Associate Professor, Department of Research Medicine, University of Pennsylvania School of Medicine, 1980–1984
Research Physician, The Institute for Cancer Research, Fox Chase Cancer Center, Philadelphia, 1979–1984
Clinical Assistant Professor, Department of Research Medicine, University of Pennsylvania School of Medicine, 1977–1980
Associate, American Oncologic Hospital, Philadelphia, 1977–1984
Epidemiologist, The Fox Chase Cancer Center, Philadelphia, 1977–1984
Member, Graduate Group in Epidemiology, University of Pennsylvania, 1977–1984
Assistant Professor of Mathematics, Indiana University, Bloomington, 1973–1977
Instructor in Mathematics, Johns Hopkins University, 1972–1973

Editorships and Editorial Review Boards

Editorial Board, *Inhalation Toxicology*, 2006–2008
Guest Editor, *Modeling and Data Analysis in Cancer Studies*, special issue of *Mathematical and Computer Modelling*, 33(12–13), 2001
Associate Editor, *Risk Analysis—An International Journal*, 2000–present
Senior Editor, *Quantitative Estimation and Prediction of Human Cancer Risk*, International Agency for Research on Cancer, Scientific Publications 131, 1999
Editor, *Scientific Issues in Quantitative Cancer Risk Assessment*, Birkhauser, Boston, 1990
Co-Editor, *Modern Statistical Methods in Chronic Disease Epidemiology*, John Wiley, 1986
Editorial Board, *Genetic Epidemiology*, 1984–1988

Publications

Mathematical

Ewing J, Moolgavkar S, Smith L, Stong RE. Stable parallelizability of lens spaces. *J Pure Appl Algebra* 1977; 10:177–191.

Ewing J, Moolgavkar S. Euler characteristics of complete intersections. *Proc Am Math Soc* 1976; 56:390–391.

Ewing J, Gustafson E, Halmos P, Moolgavkar S, Wheeler W, Ziemer W. American mathematics from 1940 to the day before yesterday. *Am Math Monthly* 1976; 83:503–516.

Ewing J, Moolgavkar S. On a conjecture of Atiyah and Thom. Preprint, Indiana University, 1976.

Ewing J, Moolgavkar S. On the group of holomorphic line bundles on an algebraic surface. Preprint, Indiana University, 1976.

Moolgavkar S. On the existence of a universal germ of deformations for elliptic pseudo group structures on compact manifolds. *Trans Am Math Soc* 1975; 212:173–197.

Ewing J, Moolgavkar S. On the signature of Fermat surfaces. *Michigan Math J* 1975; 22:257–268.

Biomedical

Moolgavkar SH, Turim J, Alexander D, Lau E, Cushing C. Potency factors for risk assessment at Libby, Montana. *Risk Analysis – An International Journal*, in press.

McClellan RO, Frampton MW, Koutrakis P, McDonnell WF, Moolgavkar S, et al. Critical considerations in evaluating scientific evidence of health effects of ambient ozone: A conference report. *Inhalation Toxicology*, 2009; 21(S2):1–36.

Moolgavkar SH, Meza R, Turim J. Pleural and peritoneal mesothelioma in SEER: Age effects and temporal trends, 1973–2005. *Cancer Causes Control* 2009. Epub ahead of print.

Meza R, Jeon J, Moolgavkar SH, Luebeck EG. The age-specific incidence of cancer: phases, transitions and biological implications. *Proceedings, Natl Acad Sci, U.S.A*, 2008 105:16284–16289.

Luebeck EG, Moolgavkar SH, Liu A, Ulrich N. Does folic acid supplementation prevent or promote colon cancer? Results from model-based predictions. *Cancer Epidemiol Biomarkers Prev* 2008; 17:1360–1367.

Little M, Heidenreich W, Moolgavkar SH, Schoellnberger H, Thomas DC. Systems biological and mechanistic modelling of radiation-induced cancer. *Rad Environ Biophys* 2008; 47:39–47.

Meza R, Hazelton WD, Colditz GA, Moolgavkar SH. Analysis of lung cancer incidence in the nurses' health and the health professionals' follow-up studies using a multistage carcinogenesis model. *Cancer Causes Control* 2008; 19:317–328.

Jeon J, Meza R, Moolgavkar SH, Luebeck EG. The evaluation of cancer screening strategies using multistage carcinogenesis models. *Math Biosci* 2008; 213:56–70.

Reiss R, Anderson EL, Cross CE, Hidy G, Hoel D, McClellan R, Moolgavkar S. Evidence of health impacts of sulfate and nitrate containing particles in ambient air. *Inhal Toxicol* 2007; 19:419–449.

Moolgavkar SH. Pollution analysis flawed by statistical model. Correspondence. *Nature* 2007; 445:21.

Hazelton WD, Moolgavkar SH, Curtis SB, Zielinski JM, Ashmore JP, Krewski D. Biologically based analysis of lung cancer incidence in a large Canadian occupational cohort with low-dose ionizing radiation exposure, and comparison with Japanese atomic bomb survivors. *J Toxicol Environ Health* 2006; 69:1013–1038.

Moolgavkar SH. Fine particles and mortality. *Inhal Toxicol* 2006; 18:93–94.

Jeon J, Luebeck EG, Moolgavkar SH. Age effects and temporal trends in adenocarcinoma of esophagus and gastric cardia. *Cancer Causes Control* 2006; 17:971–981.

Clements MS, Hakulinen T, Moolgavkar SH. Bayesian projections: What are the effects of excluding data from the younger age groups? *Am J Epidemiol* 2006; 164:292–293.

Luebeck EG, Moolgavkar SH. Biological and mathematical aspects of multistage carcinogenesis. In: *Quantitative Methods for Cancer and Human Health Risk Assessment*. Edler I, Kitsos CP (eds). Wiley-Liss, 2005.

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Hazelton WD, Clements MS, Moolgavkar SH. Multistage carcinogenesis and lung cancer mortality in three cohorts. *Cancer Epidemiol Biomarkers Prevent* 2005; 14:1171–1181.

Clements MS, Armstrong B, Moolgavkar SH. Lung cancer rate predictions using generalized additive models. *Biostatistics* 2005; 6:576–589.

Dewanji A, Luebeck EG, Moolgavkar SH. A generalized Luria-Delbruck process. *Math Biosci* 2005; 197:140–152.

Meza R, Luebeck EG, Moolgavkar SH. Gestational mutations and carcinogenesis. *Math Biosci* 2005; 197:188–210.

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Heidenreich WF, Luebeck EG, Hazelton WD, Paretzke HG, Moolgavkar SH. Response to the commentary of Donald A. Pierce (*Radiat Res* 2003; 160:718–723). *Radiat Res* 2004; 161:369–370.

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Moolgavkar SH, Krewski D, Schwarz M. Mechanisms of carcinogenesis and biologically-based models for quantitative estimation and prediction of cancer risk. pp. 179–238. In: *Quantitative Estimation and Prediction of Cancer Risk*. Moolgavkar SH, Krewski D, Zeise L, Cardis E, Moller H (eds). IARC Scientific Publications, 1999.

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- Heidenreich W, Luebeck EG, Moolgavkar SH. Some properties of the hazard function of the two-mutation clonal expansion model. *Risk Anal* 1997; 17:391–399.
- Moolgavkar SH. Stochastic cancer models: application to analyses of solid cancer incidence in the cohort of A-bomb survivors. *Nucl Ener* 1997; 36(6):447–451.
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- Luebeck EG, Moolgavkar SH. Biologically based cancer modelling. *Drug Chem Toxicol* 1996; 19:221–243.
- Luebeck EG, Curtis SB, Cross FT, Moolgavkar SH. Two-stage model of radon-induced malignant lung tumors in rats: effects of cell killing. *Rad Res* 1996; 145:163–173.
- Moolgavkar SH, Luebeck EG, Buchmann A, Bock KW. Quantitative analysis of enzyme-altered foci in rats initiated with diethylnitrosamine and promoted with 2,3,7,8-tetrachlorodibenzo-*p*-dioxin or 1,2,3,4,6,7,8-heptachloro-*p*-dioxin. *Toxicol Appl Pharmacol* 1996; 138:31–42.
- Moolgavkar SH, Luebeck EG, Hall TA, Anderson EL. Particulate air pollution and mortality. Letter to the Editor. *Epidemiology* 1996; 7:212–213.
- Moolgavkar SH, Luebeck EG. A critical review of the evidence on particulate air pollution and mortality. *Epidemiology* 1996; 7:420–428.

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Dewanji A, Luebeck EG, Moolgavkar SH. A biologically-based model for the analysis of premalignant foci of arbitrary shape. *Math Biosci* 1996; 135:55–68.

Moolgavkar SH, Luebeck EG, Hall TA, Anderson EL. Particulate air pollution, sulfur dioxide, and daily mortality: A reanalysis of the Steubenville data. *Inhal Toxicol* 1995; 7:35–44.

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Luebeck EG, Grasl-Kraupp B, Timmermann-Trosiener I, Bursch W, Schulte-Hermann R, Moolgavkar SH. Growth kinetics of enzyme altered liver foci in rats treated with phenobarbital or α -hexachlorocyclohexane. *Toxicol Appl Pharmacol* 1995; 130:30–315.

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Moolgavkar SH. When and how to combine results from multiple epidemiological studies in risk assessment. pp. 77–90. In: *The Proper Role of Epidemiology in Regulatory Risk Assessment*. Graham J (ed). Elsevier, New York, 1995.

Moolgavkar SH, Luebeck EG, Hall TA, Anderson EL. Air pollution and daily mortality in Philadelphia. *Epidemiology* 1995; 6:476–484.

Moolgavkar SH, Luebeck EG. Incorporating cell proliferation kinetics into models for cancer risk assessment. *Toxicology* 1995; 102:141–147.

Stayner L, Smith R, Bailer J, Luebeck EG, Moolgavkar SH. Methods for modelling occupational studies for cancer risk assessment. *Am J Indust Med* 1995; 27:155–170.

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Moolgavkar SH. Carcinogenesis modelling: From molecular biology to epidemiology. *Ann Rev Pub Health* 1986; 7:151–170.

Moolgavkar SH, Venzon DJ. Confidence regions for case-control and survival studies with general relative risk functions. In: *Modern Statistical Methods in Chronic Disease*

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Knudson AG, Moolgavkar SH. Inherited influences on susceptibility to radiation carcinogenesis. In: Radiation Carcinogenesis. Upton AC (ed). Elsevier/North Holland, 1986.

Prentice RL, Moolgavkar SH, Farewell VT. Biostatistical issues and concepts in epidemiologic research. *J Chron Dis* 1986; 38:1169–1183.

Moolgavkar SH. Hormones and multistage carcinogenesis. *Cancer Surv* 1986; 5:635–648.

Moolgavkar SH. Antioncogenes and cancer. pp. 19–30. In: Pathophysiological Aspects of Cancer Epidemiology. Mathe' G, Reizenstein P (eds). Pergamon Press, 1985.

Moolgavkar SH. Mutation and human cancer. pp. 31–38. In: Pathophysiological Aspects of Cancer Epidemiology. Mathe' G, Reizenstein P (eds). Pergamon Press, 1985.

Venzon DJ, Moolgavkar SH. Cohort analysis of malignant melanoma in five countries. *Am J Epidemiol* 1984; 119:1, 62–70.

Stevens RG, Moolgavkar SH. A cohort analysis of lung cancer and smoking in British males. *Am J Epidemiol* 1984; 119:624–641.

Stevens RG, Moolgavkar SH. Malignant melanoma: Dependence of site-specific risk on age. *Am J Epidemiol* 1984; 119:890–895.

Moolgavkar SH, Lustbader ED, Venzon DJ. A geometric approach to non-linear regression diagnostics with application to matched case-control studies. *Ann Stat* 1984; 12:816–826.

Stevens RG, Moolgavkar SH. Smoking and cancer in Britain. Proc. 5th World Conference on Smoking and Health, 1984.

Moolgavkar SH. Some comments on the resources at RERF. pp. 274–279. In: Utilization and Analysis of Radiation Effects Research Foundation Data. Proc. SIMS Conference. Prentice RL, Thompson DJ (eds). SIAM, 1984.

Lustbader ED, Moolgavkar SH, Venzon DJ. Tests of the null hypothesis in case-control studies. *Biometrics* 1984; 1017–1024.

Moolgavkar SH. Model for human carcinogenesis: Action of environmental agents. *Environ Health Perspect* 1983; 50:285–291.

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Stevens RG, Moolgavkar SH, Lee JAH. Temporal trends in breast cancer. *Am J Epidemiol* 1982; 115:759–777.

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Moolgavkar SH, Knudson AG. Mutation and cancer: A model for human carcinogenesis. *JNCI* 1981; 66:1037–1052.

Moolgavkar SH, Stevens RG. Smoking and cancers of bladder and pancreas: Risks and temporal trends. *JNCI* 1981; 67:15–23.

Stevens RG, Lee JAH, Moolgavkar SH. No association between oral contraceptives and malignant melanoma. *N Engl J Med* 1980; 302:966.

Moolgavkar SH. The Neyman-Scott carcinogenesis model for low-dosage extrapolation. *Math Biosci* 1980; 50:155–156.

Moolgavkar SH, Day NE, Stevens RG. Two-stage model for carcinogenesis: Epidemiology of breast cancer in females. *JNCI* 1980; 65:550–569.

Moolgavkar SH. Multistage models for carcinogenesis. *JNCI* 1980; 65:25.

Moolgavkar S, Stevens RG, Lee JAH: The effect of age on the incidence of breast cancer in females. *JNCI* 1979; 62:493–501.

Moolgavkar SH, Venzon DJ. Two-event model for carcinogenesis: Incidence curves for childhood and adult tumors. *Math Biosci* 1979; 47:55–77.

Stevens RG, Moolgavkar SH. Estimation of relative risk from vital data: Smoking and cancers of the lung and bladder. *JNCI* 1979; 63:1351–1357.

Moolgavkar S, Lee JAH, Hade RD. Comparison of age-specific mortality from breast cancer in males in the U.S. and Japan. *JNCI* 1978; 60:1223–1225.

Moolgavkar S. The multistage theory of carcinogenesis and the age distribution of cancer in man. *JNCI* 1978; 61:49–52.

Moolgavkar S. The multistage theory of carcinogenesis. *Int J Cancer* 1977; 19:730.

Jarabak R, Colvin M, Moolgavkar S, Talalay P. Δ^5 -3-ketosteroid isomerase of *Pseudomonas Testosteroni*. pp. 642–651. In: *Methods in Enzymology, Vol. XV.* Clayton RB (ed). Academic Press, NY, 1970.

Books

Moolgavkar SH, Krewski D, Zeise L, Cardis E, Moller H (eds). Quantitative estimation and prediction of human cancer risk. IARC Scientific Publications, Volume 131, 1999.

Moolgavkar SH (ed). Scientific issues in quantitative cancer risk assessment. Birkhauser Boston, 1990.

Moolgavkar SH, Prentice RL (eds). Modern statistical methods in chronic disease epidemiology. John Wiley, 1986.

Tobacco Smoking. IARC monographs on the evaluation of the carcinogenic risk of chemicals to humans. IARC, Volume 38, Lyon, 1986 (member of the working group).

Selected Invited Presentations

Moolgavkar SH. False discoveries: Challenges for understanding the environment. AAAS annual meeting, San Diego, February 2010.

Moolgavkar SH. Effects of education and primary prevention on lung cancer mortality trends. Erasmus University, Rotterdam, June 2009.

Moolgavkar SH. Multistage carcinogenesis and epidemiologic studies of cancer. University of Rochester Symposium in honor of Professor Andrei Yakovlev, April 2009.

Moolgavkar SH. Clonal expansion and carcinogenesis. International Conference on Systems Biology in Radiation Carcinogenesis, Munich, Germany, February 2007.

Moolgavkar SH. Epidemiology of colon cancer. AEK Cancer Congress, Frankfurt, Germany, February 2007.

Moolgavkar SH. Multistage carcinogenesis and epidemiologic studies of cancer. Distinguished Seminar Series, Fox Chase Cancer Center, PA, October 2005.

Moolgavkar SH. Multistage carcinogenesis and lung cancer prevention. IARC Seminar Series, Lyon, France, July 2004.

Moolgavkar SH. Radiation-induced gestational mutations and cancer. COSPAR meeting, Paris, France, July 2004.

Moolgavkar SH. Multistage carcinogenesis and radiation risk assessment. International Congress of Radiation Research, Brisbane, Australia, August 2003.

Moolgavkar SH. Cancer models and risk assessment. Environmental Mutagen Society, Annual Meeting, Miami, May 2003.

Moolgavkar SH. Methodological issues in time-series analyses of air pollution data. Meeting the Environmental Challenge of the 21st Century, Monterey, CA, March 2003.

Moolgavkar SH. Multistage carcinogenesis and risk assessment. International Biometrics Conference, Homburg, Germany, March 2001.

Moolgavkar SH. Multistage models of carcinogenesis: historical perspective, overview, implications for radiation carcinogenesis. International Workshop on Mathematical Models in Radiation Carcinogenesis, Kyoto, March 2001.

Moolgavkar SH. Modeling altered hepatic foci: issues and outstanding problems. 6th European Meeting on Hepatocarcinogenesis, Vienna, September 1999.

Moolgavkar SH. Intermediate lesions in carcinogenesis. Netherlands Institute for Health and the Environment Seminar Series, 1997.

Moolgavkar SH. Multistage model for lung cancer. International meeting of the Bernoulli Society, Calcutta, India, 1997.

Moolgavkar SH. Stochastic cancer models: Application to analyses of solid cancer incidence in the cohort of A-bomb survivors. Keynote Speaker, International symposium on low-dose and low-dose-rate radiation, Stratford-on-Avon, UK, 1997.

Moolgavkar SH. Stochastic models for estimation and prediction of cancer risk. International Symposium on Statistics in the Environment, Enschede, The Netherlands, 1997.

Moolgavkar SH. Time-series analyses of air pollution data. International Symposium on Health Effects of Particulate Air Pollution, Prague, 1997.

Moolgavkar SH. Multistage carcinogenesis, benzene exposure and leukemia risk. Berkeley Symposium on Benzene and Leukemia, Napa Valley, 1996.

Moolgavkar SH. Mutations and cell proliferation in cancer risk assessment. AACR International Workshop on Risk Assessment, Whistler BC, 1994.

Moolgavkar SH. Analysis of altered foci in rodent hepatocarcinogenesis experiments. European Toxicology Meeting, Mainz, Germany, 1993.

Moolgavkar SH. Biologically-based cancer risk assessment. International Symposium on Quantitative Risk Assessment, Research Triangle Park, NC, 1993.

Moolgavkar SH. Analysis of altered foci in rodent hepatocarcinogenesis experiments. International Workshop on Mouse Liver Tumors, Washington DC, 1992.

Moolgavkar SH. Cancer models and low-dose extrapolation of risk. Workshop on Risk Assessment and Low Dose Extrapolation, Zurich, Switzerland, 1992.

Moolgavkar SH. Cell proliferation and carcinogenesis. International Conference on Cell Proliferation in Carcinogenesis, NIEHS, North Carolina, 1992.

Moolgavkar SH. Multistage carcinogenesis and risk assessment. International Toxicology Conference, Rome, Italy, 1992.

Moolgavkar SH. A population perspective on multistage carcinogenesis. Princess Takamatsu Cancer Congress, Tokyo, Japan, 1991.

Moolgavkar SH: Cancer models. International Workshop on Biophysical Modelling of Radiation Carcinogenesis, Padua, Italy, 1991.

Moolgavkar SH. Carcinogenesis models: An overview. Hanford Symposium on Health and the Environment, Battelle PNL, Richland, WA, October 1990.

Moolgavkar SH. Analyses of altered foci in rat hepatocarcinogenesis experiments. University of Vienna Cancer Center, Vienna, Austria, July 1990.

Moolgavkar SH. Multistage models of carcinogenesis. University of Tübingen Seminar Series, Tübingen, July 1990.

Moolgavkar SH. Analyses of intermediate lesions in experimental carcinogenesis. German Cancer Research Center, Heidelberg, Germany, June 1990.

Moolgavkar SH. Analyses of altered foci in rat hepatocarcinogenesis experiments. BASF, Toxicology Group, Mannheim, 1990.

Moolgavkar SH. Cell proliferation and carcinogenesis. International Cancer Congress, Hamburg, 1990.

Moolgavkar SH. Multistage carcinogenesis. University of Pittsburgh, Department of Biostatistics Seminar Series, 1990.

Moolgavkar SH. Analysis of altered foci in hepatocarcinogenesis experiments. McArdle Laboratory, University of Wisconsin, Madison, WI, 1989.

Moolgavkar SH. Biologically-based cancer risk assessment. Society for Risk Analysis, Annual Meeting, San Francisco, CA, 1989.

Moolgavkar SH. Multistage carcinogenesis and radiation risk assessment. Radiation Research Society, Annual Meeting, Seattle, WA, 1989.

Moolgavkar SH. The role of somatic mutations and cell replication kinetics in quantitative cancer risk assessment. International Conference on Chemically Induced Cell Proliferation: Implications for Risk Assessment, Austin, TX, 1989.

Moolgavkar SH. Two mutation model for carcinogenesis: Relative roles of somatic mutations and cell proliferation in determining risk. SIMS Conference on Scientific Issues in Quantitative Cancer Risk Assessment, Alta, Utah, 1989.

Moolgavkar SH. Cancer models and risk assessment. NATO Workshop on Biologically-based Methods for Cancer Risk Assessment, Corfu, Greece, June 1988.

Moolgavkar SH. A two-stage model for carcinogenesis and its implications for risk assessment. University of Nebraska Medical Center, May 1988.

Moolgavkar SH. Biologically-based carcinogenesis models for risk assessment. Risk Assessment Workshop, Washington, DC, March 1988.

Moolgavkar SH. Biologically-based carcinogenesis models for risk assessment. Health and Welfare, Ottawa, Canada, March 1988.

Moolgavkar SH. Curvature and inference in exponential families: Application to Relative Risk Regression Models. Carleton University, Ottawa, Canada, March 1988.

Moolgavkar SH. Cox regression for the innocent bystander. Fox Chase Cancer Center Seminar, Philadelphia, PA, December 1987.

Moolgavkar SH, Prentice R. Modern statistical methods in chronic disease epidemiology. Biopharmaceutical Section of ASA (tutorial and short course), Newark, NJ, December 1987.

Moolgavkar SH. Biologically motivated two-stage model for carcinogenesis. 17th Conference on Toxicology, Wright-Patterson Air Force Base, Dayton, OH, November 1987.

Moolgavkar SH. Two-stage model for carcinogenesis. University of Wisconsin Seminars, "Curvature and Inference in Exponential Families: Application to Relative Risk Regression Models," Department of Human Oncology, Madison, OH, November 1987.

Moolgavkar SH. Two mutation model for cancer risk assessment. EPA Toxicology and Microbiology Seminar Series, Cincinnati, OH, October 1987.

Moolgavkar SH. Origin invariant relative risk functions: multi-stage models for cancer risk assessment. American Statistical Association Annual Meeting, San Francisco, CA, August 1987.

Moolgavkar SH. Biologically-based carcinogenesis models for risk assessment. Risk Assessment Workshop, Washington, DC, March 1987.

Moolgavkar SH. Two-stage model for carcinogenesis: implications for risk assessment. Symposium on Quantitative Assessment of Cancer Risk, Washington, DC, February 1987.

Moolgavkar SH. A cohort analysis of smoking and cancers of the lung, bladder and pancreas. School of Public Health grand rounds, Department of Biostatistics Seminar on General Relative

Risk Regression Models for Epidemiologic Studies, University of Pittsburgh, Pittsburgh, PA, January 1987.

Moolgavkar SH. Two-stage model for carcinogenesis and the IPI protocol. Battelle PNL, Richland, WA, 1986.

Moolgavkar SH. Modern statistical methods in chronic disease epidemiology. SIMS conference, Alta, UT, June 1985.

Moolgavkar SH. Time related factors in cancer epidemiology. NIH International Symposium, April 1985.

Moolgavkar SH. General relative risk models for case-control studies. Johns Hopkins University, School of Public Health, Baltimore, MD, 1985.

Moolgavkar SH. Stochastic models for carcinogenesis and risk assessment. EPA, Washington, DC, 1985.

Moolgavkar SH. Risk assessment using vital data. SIMS Conference on Environmental Epidemiology and Risk Assessment, Alta, UT, June 1982.

Selected Professional Activities

- Consultant, Fox Chase Cancer Center
- Consultant, Health and Welfare, Canada
- Consultant, University of Nebraska Medical Center
- Member, IARC (International Agency for Research on Cancer) working group on Tobacco Smoking
- Member, NIH Special Study Section for Biometry
- Member, NSF panel to review scientific bases of risk assessment methodologies
- Member, External Science Advisory Board, RISC-RAD project of the European Union, ongoing
- Member, External Science Advisory Board, California Air Resources Board, ongoing
- Invited Expert, Workshop on Mechanisms of Fiber Carcinogenesis, IARC, Lyon, France, November, 2005
- Area Editor for Health and Environment, *Risk Analysis—An International Journal*, Jan 2000–present
- Senior Editor of monograph *Quantitative Estimation and Prediction of Cancer Risk* IARC Scientific Publications, No. 131, 1999
- Co-chairman, International Conference on Mathematical Models in Cancer, Park City, Utah, 1998
- Member, Health Effects Institute Expert Panel for re-analyses of critical air pollution studies, 1997–2000
- Member, Working Group on quantitative estimation and prediction of cancer risk, IARC, Lyon, 1993

- Member, Scientific Advisory Panel to the CIIT Centers for Health Research, 1992–2005
- Member, Scientific Advisory Panel to review the EPA Dioxin Health Assessment document, 1992
- Member, Scientific Advisory Panel to review Risk Assessment program of the National Center for Toxicologic Research, 1992
- Organizer and Chair, SIMS conference “Scientific Issues in Quantitative Cancer Risk Assessment”, held in Snowbird, Utah, June 1989
- Member, Advisory Committee to review risk assessment program of Armstrong Laboratories, Wright-Patterson Air Force Base, 1987
- Member, External Scientific Committee to review the program of the Radiation Epidemiology Branch, NCI, 1987
- Co-chairman of SIMS conference “Modern Statistical Methods in Chronic Disease Epidemiology” held in Alta, Utah, in June 1985
- Session Chairman at International Symposium: “Time Related Factors in Cancer Epidemiology,” held at NIH in April 1985