

# STEVEN R. TANNENBAUM

## *Curriculum Vitae*

Business Address: Massachusetts Institute of Technology  
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Present Position: Underwood-Prescott Professor of Toxicology, Department of Biological Engineering; Professor of Chemistry, Department of Chemistry, Massachusetts Institute of Technology

Date of Birth: February 23, 1937; New York

### Educational Background:

1954-1958: Massachusetts Institute of Technology  
B.S. in Food Technology

1958-1962: Massachusetts Institute of Technology  
Ph.D. in Food Science and Technology  
(Minor: Chemistry)

### Academic Positions

Feb 2002-July 2003: Co-Director, Biological Engineering Division, MIT

July 1998-Feb 2002: Co-Director, Division of Bioengineering and Environmental Health, MIT

July 1996-June 1998: Director, Division of Toxicology, Massachusetts Institute of Technology

July 1988-June 1995: Registration and Admissions Officer, Program in Toxicology

April 1981-July 1988: Professor of Toxicology and Food Chemistry; Registration and Admissions Officer, Department of Applied Biological Sciences, MIT

July 1974-April 1981: Professor of Food Chemistry, Department of Nutrition and Food Science, Massachusetts Institute of Technology

Sept 1973-July 1974: Visiting Professor, Hebrew University of Jerusalem, Faculty of Agriculture, Rehovoth

July 1969-July 1974: Associate Professor, Department of Nutrition and Food Science, Massachusetts Institute of Technology

July 1964-July 1969: Assistant Professor, Department of Nutrition and Food Science, Massachusetts Institute of Technology

Honors and Awards:

AACR Award for Outstanding Achievement in Chemistry in Cancer Research 2008  
Princess Takamatsu Cancer Research Fund Lecturer 2007  
Fellow of American Association for the Advancement of Science 2006  
University of Pittsburgh School of Pharmacy, Distinguished Lecturer, 2003  
Japan Society for Promotion of Cancer Research, Fellowship, 2001  
Institute of Medicine, National Academy of Sciences, USA, Member, 1996  
Japan Society for the Promotion of Science, Fellowship, 1995  
BASF Visiting Professor, Dept. of Chemistry, University of Kaiserslautern, 1994  
Nakasone Fellowship, National Cancer Center Research Institute, Tokyo, 1982  
Babcock Hart Award, Institute of Food Technologists, 1980  
Fred W. Tanner Lecture Award, Chicago Section IFT, 1976  
Samuel Cate Prescott Award for Research, Institute of Food Technologist, 1970

Society Memberships:

ISSX  
American Association for the Advancement of Science  
American Association for Cancer Research  
American Chemical Society  
The Oxygen Society  
American Institute of Nutrition  
Institute of Food Technologists (Fellow)  
Sigma Xi  
Society of Toxicology

Editorial Boards:

Current Drug Metabolism, 2002-  
Cancer Research, Associate Editor, 1991- 2002  
Cancer Epidemiology, Biomarkers and Prevention, Associate Editor, 1991-2001  
Chemical Research in Toxicology, 1987-1990, 1992-2000  
Japanese Journal of Cancer Research (GANN), 1986- (now Cancer Science)  
Food Chemistry, 1977-1985  
Institute of Food Technologists, Scientific Journals, 1970-1973

Advisory Groups:

Air Force Scientific Advisory Board, *ad hoc* member, 1999  
National Institute of Environmental Health Sciences, Scientific Review Committee, 1996-7  
National Cancer Institute, Board of Scientific Counselors, Division of Cancer Etiology, 1995  
National Cancer Institute, Frederick Cancer Research Facility Advisory Committee, 1989-1994  
National Toxicology Program, Peer Review Committee, 1983-1985  
National Cancer Institute, Cancer Special Program Advisory Committee, 1979-1982  
American Cancer Society, Advisory Committee on Biochemistry and Chemical Carcinogenesis, 1977-1981; Advisory Committee on Special Institutional Grants, 1980-1984

National Academy of Sciences - National Research Council

Committee on Assessment of the Health Implications of Exposure to Dioxins, 2004-  
Review of EPA Homeland Security Efforts: Committee on Safe Buildings Program,  
Chair 2003

Board on Army Science and Technology, Committee on Review and Evaluation of the  
Army Chemical Stockpile Disposal Program, 1999-2000

Committee on Nitrate and Nitrite in Drinking Water  
Safe Drinking Water Committee

Committee on Amines

Committee on Food Standards and Fortification Policy

Board on Environmental Studies and Toxicology

Contributing Editor, Nutrition Reviews, 1973-1979

Co-Convenor, Theme III, International Biological Program, 1972-1974

IFT Expert Panel on Food Safety and Nutrition, 1971-1973; Co-Chairman, 1976-1977;  
Chairman, 1977-1978

Associate Member, International Union of Pure and Applied Chemistry, Food Section,  
1971-1973

Consultant, U.S. Food and Drug Administration, 1971-1973

U.S. Peace Corps, Advisor to Fisheries Institute, Government of Chile, 1970

Consultant to the Protein Advisory Group, United Nations and to the United Nations  
Development Program, 1970-1974

Graduate Education Committee, Institute of Food Technologists, 1968-1972.

Panel on Food Safety, White House Conference on Food, Nutrition and Health, 1969

Consultant, Institute of Nutrition for Central America and Panama, 1968

Consultant to the Administrator, United Nations Development Program, Mission to  
Peru, 1966

Elected Offices:

Chairman, Nominating Committee, American Chemical Society, Division of  
Chemical Toxicology, 1997-2001

Sectional Councilor, Northeast Section of the Institute of Food Technologists, 1966-1969

Councilor, American College of Toxicology, 1983-1985

Massachusetts Institute of Technology:

MIT Center for Biomedical Innovation (CBI), Co-director, 2004 - current

Cambridge University – MIT Institute: Director of Research, 2003-2004

School of Engineering Council, 1998-2003

Chairman of the Advisory Committee on the Selection of the Dean of the Graduate  
School, 1995-1996

Committee on Graduate School Policy, 1982-1995

Independent Activities Period Policy Committee, 1971-1973

Committee on Academic Performance, 1971-1973

Committee on Educational Policy, 1971-1973

Freshman Advisory Council, 1967-1969

### Educational and Research Training at MIT

18	M.S. Graduates	
30	Ph.D. Graduates	33 Countries
43	Postdoctoral Associates/Fellows	

### Current Research Activities:

**Nitric Oxide: Chemistry and Pathophysiology.** Our laboratory has been interested for many years in the formation, distribution, and metabolism of nitrate, nitrite, and N-nitroso compounds. This work led to our discovery of the endogenous synthesis of nitrogen oxides and eventually the discovery of nitric oxide as a biological molecule. At present our laboratory is conducting research on the pathophysiological consequences of nitric oxide and its oxidation products. This encompasses cell-mediated nitrosation, free-radical reactions, and oxidation. We are particularly interested in the nature of chemical damage to DNA and its genotoxic consequences. From a health point of view this is important for the inflammatory state and for various infections and diseases that increase the risk of cancer. We are also interested in the inhibition of these reactions by antioxidants and other substances that offer protection from oxidative stress.

**Tissue Engineering for Drug Development and Chemical Toxicity.** Cells placed in culture generally lose at least some key differentiated physiological functions that they normally exhibit as part of organized tissues in the body. Thus, while cultured cells may be adequate for some applications in drug metabolism detection of toxins, they are certain to fail for others. We have developed an *in vitro* organized tissue-based sensor for detection of unknown toxins and rapid screening of drug metabolism. The technology combines a unique chip-based micro tissue arrangement with mass spectrometric and optical sensors to detect changes in tissue behavior and measure primary and secondary biochemical transformations of drugs and toxins.

### **Quantitative Ultramicro Measurements for Drug and Carcinogen Metabolism.**

We are developing new approaches to measure the fate of drugs and chemicals in the classical paradigm for drug metabolism: Absorption, Distribution, Metabolism, Excretion (ADME). The methods include variations in biological Mass Spectrometry and Laser-Induced Fluorescence Spectroscopy. An important new, unique tool is an Accelerator Mass Spectrometer for C14 and tritium that will be directly coupled to gas and liquid chromatography. These tools will enable us to conduct "Nanotracing" of molecules in humans at heretofore unexplored levels.

### Publications

Over 300 research and review papers  
7 books edited or co-edited  
11 U.S. patents

BOOKS

R.I. Mateles and S.R. Tannenbaum (editors). 1968. Single-Cell Protein, MIT Press, Cambridge, MA

S.R. Tannenbaum and D.I.C. Wang (editors). 1975. Single-Cell Protein II, MIT Press, Cambridge, MA

S.R. Tannenbaum, N.S. Scrimshaw and B.R. Stillings (editors). 1974. The Economics, Marketing and Technology of Fish Protein Concentrate, MIT Press, Cambridge, MA

J.R. Whitaker and S.R. Tannenbaum (editors). 1977. Food Proteins, AVI, Westport, CT

S.R. Tannenbaum (editor). 1979. Nutritional and Safety Aspects of Food Processing, Marcel Dekker, Inc., New York, NY

W.R. Bruce, P. Correa, M. Lipkin, S.R. Tannenbaum, and T.D. Wilkins (editors). 1981. Gastrointestinal Cancer: Endogenous Factors, Cold Spring Harbor Laboratory, NY

R.A. Scanlan and S.R. Tannenbaum (editors). 1981. N-Nitroso Compounds. ACS Symposium Series #174, American Chemical Society: Washington, DC

U.S. PATENTS

S.R. Tannenbaum, A.J. Sinskey and S.B. Maul. 1973 (March 13). "Process of Reducing the Nucleic Acid Content in Yeast", Patent #3,720,585.

S.R. Tannenbaum. 1974 (October 29). "Texturizing Process for Single Cell Protein" Patent #3,845,049.

S.R. Tannenbaum. 1975 (April 15). "Biochemical Temperature-sensitive Probe and Method for Measuring Reactant Concentrations Thereof", Patent #3,878,049.

S.R. Tannenbaum. 1975 (December 9). "Texturing Process for Single Cell Protein Containing Protein Mixtures", Patent #3,925,562.

S.R. Tannenbaum, A.J. Sinskey and S.B. Maul. 1976 (July 6). "Process for Reducing Nucleic Acid Content of Yeasts and Bacteria", Patent #3,968,009.

C. Green, F. Fiedler, T.J. Hansen, G.N. Wogan, S.R. Tannenbaum and T.L. Benjamin. 1992 (August 18). "Assay Method for Detecting Listeria", Patent #5,139,933.

T.L. Benjamin, J. Chen-Wu, T. Hansen, B. Jackson, D. Livingston, S. Tannenbaum, and G. Wogan. 1996 (February 13). "Assay Method for Detecting the Presence of Bacteria", Patent #5,491,068.

L.G. Griffith, S. Tannenbaum, M.J. Powers, K. Domansky and C.D. Thompson. 1999 (March 18) "Vascularized Perfused Microtissue/Micro-Organ Arrays", Patent #6,197,575

J.K. Leach and S.R. Tannenbaum. 2002. (July 30) "Methods for Perfusion and Plating of Primary Hepatocytes and a Medium Therefore" Patent Pending.

B.J. Hughey, P.L. Skipper, J.S. Wishnok, R.E. Shefer, J.T. Mehl, S.R. Tannenbaum. 2001 (aug 23) "Sample Introduction Interface for Analytical Processing of a Sample Placed on a Substrate" Patent #6,707,035.

B.J. Hughey, P.L. Skipper, J.S. Wishnok, R.E. Shefer, N.A. Fried, J.T. Mehl, S.R. Tannenbaum. 2002 (Aug 23) "Sample Introduction Interface for Analytical Processing" Patent #6,867,415

PUBLICATONS

S.R. Tannenbaum and E.L. Wick. 1962. Separation of the diastereoisomers of methyl 2,4-dimethylheptanoate. *J. Org. Chem.*, **27**, 2650.

S.R. Tannenbaum and S.A. Miller. 1965. Urinary metabolites in the omega-oxidation of 2,4-dimethylheptanoic acid. *Nature*, **208**, 452-453.

S.A. Miller and S.R. Tannenbaum. 1968. The metabolism in vivo of [2-Me-<sup>14</sup>C]2,4-dimethylheptanoic acid. *Biochem. Biophys. Acta*, **152**, 511-518.

M.C. Archer, S.D. Clark, J.E. Thilly and S.R. Tannenbaum. 1971. Environmental nitroso compounds: reaction of nitrite with creatine and creatinine. *Science* **174**, 1341-1343.

T.Y. Fan and S.R. Tannenbaum. 1971. Automatic colorimetric determination of N-nitroso compounds. *Journal of Agricultural and Food Chemistry* **19**, 1267-1269.

T.Y. Fan and S.R. Tannenbaum. 1972. Stability of N-nitroso compounds. *Journal of Food Science* **37**, 274-276.

S.R. Tannenbaum. 1972. Nitrite and nitrosamine content of foods: unsolved problems and current research. Proc. of the 25th Reciprocal Meat Conference, American Meat Association, Ames, Iowa, National Livestock and Meat Board: Chicago, IL.

M.C. Archer and S.R. Tannenbaum. 1973. Nitrosation in the environment. Can it occur? Reply to Comments. *Science* **179**, 97.

T.Y. Fan and S.R. Tannenbaum. 1973. Factors influencing the rate of formation of nitroso-morpholine from morpholine and nitrite: acceleration by thiocyanate and other anions. *J. Agric. Food Chem.* **21**, 237-240.

T.Y. Fan and S.R. Tannenbaum. 1973. Natural inhibitors of nitrosation reactions: the concept of available nitrite. *J. Food Sci.* **38**, 1067-1069.

T.Y. Fan and S.R. Tannenbaum. 1973. Factors influencing the rate of formation of nitroso-morpholine from morpholine and nitrite. 2. Rate enhancement in frozen solution. *J. Agric. Food Chem.* **21**, 967-969.

P. Issenberg and S.R. Tannenbaum. 1973. Approaches to determination of volatile and non-volatile N-nitroso compounds in foods and beverages. In: *N-Nitroso Compounds and Formation of Nitrosamines*, IARC Scientific Publication No. 3, I.A.R.C.: Lyon, France, pp. 31-37.

S.S. Mirvish, J. Sams, T.Y. Fan and S.R. Tannenbaum. 1973. Kinetics of nitrosation of the amino acids proline, hydroxyproline, and sarcosine. *J. Natl. Cancer Inst.* **51**, 1833-1839.

S.R. Tannenbaum and T.Y. Fan. 1973. Uncertainties about nitrosamine formation - in and from foods. Proc. of the Meat Industry Research Conference, American Meat Institute Foundation: Chicago, IL.

W. Iwaoka, M. Weisman and S.R. Tannenbaum. 1974. A solvent-partitioning, high-speed, liquid chromatographic procedure for the clean-up in the analysis of nitrosamines. In: *N-Nitroso Compounds in the Environment*, P. Bogovski and E.A. Walker (eds.), IARC Scientific Publication No. 9, I.A.R.C.: Lyon, France, pp. 32-35.

S.R. Tannenbaum, A.J. Sinskey, M. Weisman and W. Bishop. 1974. Nitrite in human saliva. Its possible relationship to nitrosamine formation. *Journal of the National Cancer Institute* **53**, 79-84.

M.C. Archer, S.R. Tannenbaum, T.Y. Fan and M. Weisman. 1975. Reaction of nitrite with ascorbate and its relation to nitrosamine formation. *Journal of the National Cancer Institute* **54**, 1203-1205.

P. Correa, W. Haenszel, C. Cuello, S.R. Tannenbaum and M.C. Archer. 1975. A model for gastric cancer epidemiology. *Lancet (July 12)*, pp. 58-62.

D.M. Moran, S.R. Tannenbaum and M.C. Archer. 1975. Inhibitor of *clostridium perfringens* formed by heating sodium nitrite in a chemically defined medium. *Applied Microbiology*. **30**, 838-843.

G.N. Wogan and S.R. Tannenbaum. 1975. Environmental N-nitroso compounds: implications for public health. *Toxicol. Appl. Pharm.* **31**, 375-383.

G.N. Wogan, S. Paglialunga, M.C. Archer and S.R. Tannenbaum. 1975. Carcinogenicity of nitrosation products of ephedrine, sarcosine, folic acid and creatinine. *Cancer Res.* **35**, 1981-1984.

M.C. Archer, S.R. Tannenbaum and J.S. Wishnok. 1976. Nitrosamine formation in the presence of carbonyl compounds. In: *Environmental N-Nitroso Compounds: Analysis and Formation*, E.A. Walker, P. Bogovski, and L. Grieciute (eds.), IARC Scientific Publication No. 14, I.A.R.C.: Lyon, France, pp. 141-145.

J.E. Baldwin, S.E. Branz, R.F. Gomez, P.L. Kraft, A.J. Sinskey and S.R. Tannenbaum. 1976. Chemical activation of nitrosamines into mutagenic agents. *Tetrahedron Lett.* **5**, 333-336.

C. Cuello, P. Correa, W. Haenszel, G. Gordillo, C. Brown, M. Archer and S.R. Tannenbaum. 1976. Gastric cancer in Colombia. I. Cancer risk and suspect environmental agents. *J. Natl. Canc. Inst.* **57**, 1015-1035.

L. Green, T.J. Hansen, W.T. Iwaoka and S.R. Tannenbaum. 1976. Specific detection systems for the chromatographic analysis of nitrosamines. Proc. of 2nd International Symposium Nitrite Meat Prod., Zeist: Pudoc, Wageningen, pp. 145-153.

- S.T. Hsieh, P.L. Kraft, M.C. Archer and S.R. Tannenbaum. 1976. Reaction of nitrosamines in the udenfriend system: Principal products and biological activity. *Mutat. Res.* **35**, 23-28.
- W. Iwaoka and S.R. Tannenbaum. 1976. Liquid chromatography of N-nitrosoamino acids and their Syn and Anti conformers. *J. Chromatogr.* **124**, 105-110.
- W. Iwaoka and S.R. Tannenbaum. 1976. Photohydrolytic detection of N-nitroso compounds in high-performance liquid chromatography. In: *Environmental N-Nitroso Compounds Analysis and Formation*, E.A. Walker, P. Bogovski, L. Gričiute (eds.), *IARC Scientific Publication No. 14*, I.A.R.C.: Lyon, France, pp. 51-56.
- S.R. Tannenbaum. 1976. Relative risk of nitrate and nitrite ingestion. Proc. of the Meat Industry Research Conference, American Meat Institute Foundation: Arlington, VA (March 25).
- S.R. Tannenbaum, M. Weisman and D. Fett. 1976. The effect of nitrate intake on nitrite formation in human saliva. *Food Cosmet. Toxicol.* **14**, 549-552.
- S.R. Tannenbaum. 1976. Nitrates, nitrites, and N-nitroso compounds as environmental hazards: a personal perspective. Proc. of American Cancer Society, 18th Science Writer's Seminar, St. Petersburg Beach, FL (March 26-30).
- J.S. Wishnok and S.R. Tannenbaum. 1976. Formation of cyanamides from secondary amines in human saliva. *Science* **191**, 1179-1180.
- T. Hansen, W. Iwaoka, L. Green and S.R. Tannenbaum. 1977. Analysis of N-nitrosoproline in raw bacon. Further evidence that nitrosoproline is not a major precursor of nitrosopyrrolidine. *J. Agr. Food Chem.* **25**, 1423-1426.
- P.L. Skipper, S.R. Tannenbaum, J.E. Baldwin and A. Scott. 1977. Alkylation by alpha-acetoxy-N-nitrosamines: Models for N-nitrosamine metabolites. *Tetrahedron Lett.* **49**, 4269-4272.
- S.R. Tannenbaum, P. Kraft, J. Baldwin and S. Branz. 1977. The mutagenicity of methylbenzyl nitrosamine and its alpha-acetoxy derivatives. *Cancer Lett.* **2**, 305-310.
- S.R. Tannenbaum, M.C. Archer, J.S. Wishnok, P. Correa, C. Cuello and W. Haenszel. 1977. Nitrate and the etiology of gastric cancer. In: *Origins of Human Cancer*. Cold Spring Harbor: New York, Vol. IV of the Cell Proliferation Series, pp. 1609-1625.
- J.S. Wishnok and S.R. Tannenbaum. 1977. An unknown salivary morpholine metabolite. *Anal. Chem.* **49**, 715A.
- J.E. Baldwin, A. Scott, S.E. Branz, S.R. Tannenbaum and L. Green. 1978. Chemical studies on carcinogenic nitrosamines. 1. Hydrolysis of alpha-acetoxynitrosamines. *J. Org. Chem.* **43**, 2427-2431.
- S.R. Tannenbaum, M.C. Archer, J.S. Wishnok and W.W. Bishop. 1978. Nitrosamine formation in human saliva. *J. Natl. Canc. Inst.* **60**, 251-253.

S.R. Tannenbaum, D. Fett, V.R. Young, P.D. Land and W.R. Bruce. 1978. Nitrite and nitrate are formed by endogenous synthesis in the human intestine. *Science* **200**, 1487-1489.

S.R. Tannenbaum, J.S. Wishnok, J.S. Hovis and W.W. Bishop. 1978. N-Nitroso compounds from the reaction of primary amines with nitrite and thiocyanate. In: *Environmental Aspects of N-Nitroso Compounds*, E.A. Walker, M. Castegnaro, L. Griquite, and R.E. Lyle (eds.), *IARC Scientific Publication No. 19*, I.A.R.C.: Lyon, France, pp. 155-160.

P. Correa, C. Cuello, G. Gordillo, G. Zarama, J. Lopez, W. Haenszel and S.R. Tannenbaum. 1979. The gastric micro-environment in populations at high to stomach cancer. *J. Natl. Canc. Inst.* **53**, 167-170.

T.J. Hansen, M.C. Archer and S.R. Tannenbaum. 1979. Identification of nitrohexane in corn treated with nitrous acid. *J. Agr. Food Chem.* **27**, 1072-1075.

T.J. Hansen, M.C. Archer and S.R. Tannenbaum. 1979. Characterization of pyrolysis conditions and interference by other compounds in the chemiluminescence detection of nitrosamines. *Anal. Chem.* **51**, 1526-1528.

W.J. Mergens, F.M. Vane, S.R. Tannenbaum, L. Green and P.L. Skipper. 1979. *In vitro* nitrosation of methapyrilene. *J. Pharm. Sci.* **68**, 827-832.

S.R. Tannenbaum. 1979. Endogenous formation of nitrite and N-nitroso compounds. In: *Naturally Occurring Carcinogens-Mutagens and Modulators of Carcinogenesis*, E.C. Miller *et al.* (eds.), Japan Sci. Soc. Press: Tokyo/University Park Press: Baltimore, pp. 211-220.

S.R. Tannenbaum. 1979. Relative risk assessment of various sources of nitrite. Meat industry Research Conference, American Meat Institute: Arlington, VA.

S.R. Tannenbaum, D. Moran, W. Rand, C. Cuello and P. Correa. 1979. Gastric cancer in Colombia. 4. Nitrite and other ions in gastric contents of residents from a high-risk region. *J. Natl. Canc. Inst.* **62**, 9-12.

M.C. Archer, T.J. Hansen and S.R. Tannenbaum. 1980. Compounds formed by treatment of corn (*zea mays*) with nitrous acid. Proc. of the Sixth Meeting on Analysis and Formation of N-Nitroso Compounds, Budapest, *IARC Scientific Publication No. 31*, I.A.R.C.: Lyon, France, pp. 305-318.

Y-K. Kim, S.R. Tannenbaum and J.S. Wishnok. 1980. Nitrosation of dialkylamines in the presence of bile acid conjugates. Proc. of the Sixth Meeting on Analysis and Formation of N-Nitroso Compounds, Budapest, *IARC Scientific Publication No. 31*, I.A.R.C.: Lyon, France, pp. 207-214.

P.L. Kraft, P.L. Skipper and S.R. Tannenbaum. 1980. *In vivo* metabolism and whole-blood clearance of N-nitrosomethylbenzylamine in the rat. *Cancer Res.* **40**, 2740-2742.

- P.L. Kraft and S.R. Tannenbaum. 1980. Distribution of N-nitrosomethylbenzylamine evaluated by whole body radioautography and densitometry. *Cancer Res.* **40**, 1921-1927.
- M.W. Obiedzinski, J.S. Wishnok and S.R. Tannenbaum. 1980. N-Nitroso compounds from reactions of nitrite with methylamine. *Food and Cosmet. Toxicol.* **18**, 585-589.
- P.L. Skipper, S.R. Tannenbaum, W.G. Thilly, E.E. Furth and W.W. Bishop. 1980. Mutagenicity of hydroxamic acids and the probable involvement of arbamoylation. *Cancer Res.* **40**, 4704-4708.
- S.R. Tannenbaum. 1980. Ins and outs of nitrites. *The Sciences (January)*, pp. 7-9.
- S.R. Tannenbaum. 1980. A model for estimation of human exposure to endogenous N-nitrosodimethylamine. *Oncology* **37**, 232-235.
- S.R. Tannenbaum, L.C. Green, K.R. deLuzuriaga, G. Gordillo, L. Ullman and V.R. Young. 1980. Endogenous carcinogenesis: nitrate, nitrite and N-nitroso compounds. In: *Carcinogenesis: Fundamental Mechanisms and Environmental Effects*, B. Pullman, P.O.P. Ts'o, H. Gelboin (eds.), D. Reidel Pub. Co.: Dordrecht, pp. 287-296.
- S.R. Tannenbaum and W. Mergens. 1980. Reaction of nitrite with vitamins C and E. *Annals of New York Academy of Sciences* **355**, 267-277.
- S.R. Tannenbaum and V.R. Young. 1980. Endogenous nitrite formation in man. *J. Environ. Pathol. and Toxicol.* **3**, 357-368.
- S.R. Tannenbaum, V.R. Young, L. Green and K. Ruiz de Luzuriaga. 1980. Intestinal formation of nitrite and N-nitroso compounds. Proc. of the Sixth Meeting on Analysis and Formation of N-Nitroso Compounds, Budapest, *IARC Scientific Publication No. 31*, I.A.R.C.: Lyon, France, pp. 281-289.
- P. Correa and S.R. Tannenbaum. 1981. The Microecology of gastric cancer. In: *N-Nitroso Compounds*, R.A. Scanlan and S.R. Tannenbaum (eds.), *Advances in Chemistry Symposium Series No. 174*, **22**, American Chemical Society: Washington, DC, pp. 319-329.
- L.C. Green, K. Ruiz de Luzuriaga, D.A. Wagner, W. Rand, N. Istfan, V.R. Young and S.R. Tannenbaum. 1981. Nitrate biosynthesis in man. *Proc. Natl. Acad. Sci.* **78**, 7764-7768.
- L. Green, S.R. Tannenbaum and P. Goldman. 1981. Nitrate synthesis in the germfree and conventional rat. *Science* **212**, 56-58.
- T.J. Hansen, S.R. Tannenbaum and M.C. Archer. 1981. Identification of a nonenylnitrolic acid in corn treated with nitrous acid. *J. Agr. Food Chem.* **29**, 1008-1011.
- P.L. Kraft, P.L. Skipper, G. Charnley and S.R. Tannenbaum. 1981. Urinary excretion of dimethylnitrosamine: A quantitative relationship between dose and urinary excretion. *Carcinogenesis* **2**, 609-612.

- D. Ralt, R. Gomez and S.R. Tannenbaum. 1981. Conversion of acetohydroxamate and hydroxylamine to nitrite by intestinal microorganisms. *Eur. J. Appl. Microbiol. Biotech.* **12**, 226-230.
- D. Ralt and S.R. Tannenbaum. 1981. The role of bacteria in nitrosamine formation. In: *N-Nitroso Compounds*, R.A. Scanlan and S.R. Tannenbaum (eds.), *Advances in Chemistry Series No. 174*, American Chemical Society: Washington, DC, pp. 157-164.
- D.E.G. Shuker, S.R. Tannenbaum and J.S. Wishnok. 1981. N-Nitroso bile acid conjugates. 1. Synthesis, chemical reactivity, and mutagenic activity. *J. Org. Chem.* **46**, 2092-2096.
- S.R. Tannenbaum. 1981. Endogenous formation of N-nitroso compounds. In: *Gastrointestinal Cancer: Endogenous Factors, Banbury Report No. 7*, Cold Spring Harbor Laboratory: New York, pp. 269-273.
- S.R. Tannenbaum and L.C. Green. 1981. Metabolism of nitrate. In: *Gastrointestinal Cancer: Endogenous Factors, Banbury Report No. 7*, Cold Spring Harbor Laboratory: New York, pp. 331-341.
- S.R. Tannenbaum and D. Moran. 1981. Epidemiological studies of nitrate, nitrite and gastric cancer. In: *Safety Evaluation of Nitrosatable Drugs & Chemicals*, G.G. Gibson and C. Ioannides (eds.), Taylor & Francis Ltd.: London, pp. 234-244.
- S.R. Tannenbaum, D. Moran, K.R. Falchuk, P. Correa and C. Cuello. 1981. Nitrite stability and nitrosation potential in human gastric juice. *Cancer Lett.* **14**, 131-136.
- G. Charnley, S.R. Tannenbaum and P. Correa. 1982. Gastric cancer: an etiologic model. In: *Nitrosamines in Human Cancer*, P.N. Magee (ed.), *Banbury Report No. 12*, Cold Spring Harbor Laboratories: New York, pp. 503-522.
- P. Correa, W. Haenszel and S.R. Tannenbaum. 1982. Epidemiology of gastric carcinoma: review and future prospects. *N.C.I. Monograph No. 62*, NCI, U.S. Dept. HHS, Public Health Service: Bethesda, MD, pp. 129-134.
- L.C. Green, S.R. Tannenbaum and J.G. Fox. 1982. Nitrate in human and canine milk. Letter to the Editor. *N.E. J. Med.* **306**, 1367.
- L. Green, D. Ralt and S.R. Tannenbaum. 1982. Nitrate, nitrite and N-nitroso compounds: Biochemistry, metabolism, toxicity and carcinogenicity. In: *Human Nutrition. Current Issues and Controversies*, A. Neuberger and T.H. Jukes (eds.), MTP Press Limited: Lancaster, England, pp. 87-140.
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