

## **CURRICULUM VITAE**

Ana M. Soto, M.D., Professor  
Tufts University, School of Medicine  
Department of Immunology  
136 Harrison Avenue, Boston, MA 02111

Phone: +1(617) 636-6954  
Email: ANA.SOTO@TUFTS.EDU  
web: <http://sotosonlab>.

## **EDUCATION**

1970 M.D. University of Buenos Aires, Argentina.  
1964 B.S. Colegio Elizalde, Buenos Aires, Argentina.

## **POSTDOCTORAL TRAINING**

### **Internship**

1970-1971 Intern in Medicine, Italian Hospital, Buenos Aires, Argentina.

### **Research Fellowships**

1977-1982 Research Associate, Department of Anatomy and Cellular Biology, Tufts University School of Medicine  
1976-1977 Research Fellow, Fondation de l'Industrie Pharmaceutique INSERM Unité 33, Hopital Debrousse, Lyon, France  
1973-1976 Research Associate, Cancer Research Center, Tufts University School of Medicine  
1971-1973 Postdoctoral Fellow, Department of Biological Chemistry, School of Biochemistry, University of Buenos Aires, Argentina

## **ACADEMIC APPOINTMENTS**

2017 Professor, Department of Immunology, Tufts University School of Medicine  
2014 Professor, Department of Integrative Physiology and Pathobiology, Tufts University School of Medicine  
2000- Professor, Department of Anatomy and Cellular Biology, Tufts University School of Medicine  
1992-2000 Associate Professor, Department of Anatomy and Cellular Biology, Tufts University School of Medicine, tenured in 1994  
1990-1992 Research Associate Professor, Department of Anatomy and Cellular Biology, Tufts University Health Science Schools  
1982-1990 Research Assistant Professor, Department of Anatomy and Cellular Biology, Tufts University Health Science Schools  
1968-1973 Instructor in Physiology, University of Buenos Aires School of Medicine, Argentina

## **OTHER PROFESSIONAL POSITIONS AND MAJOR VISITING APPOINTMENTS**

2021-2022 Fellow, Institute for Advanced Studies, Nantes, France  
2015- Foreign Correspondent Member, Centre Cavallès, École Normale Supérieure, Paris, France  
2013-2015 Blaise Pascal Chair, École Normale Supérieure, Paris, France

2012-2012 Visiting Professor, Muséum Nationale d’Histoire Naturelle, Paris, France (host: Prof. B. Demeneix)

2011- Fellow of the Ramazzini College, Carpi, Italy

2008-2008 Visiting Professor, Department of Computer Sciences, École Normale Supérieure, Paris, France (host: Prof. G. Longo)

2007-2014 Professor, University of Ulster, Coleraine, U.K.

2005 Visiting Professor, University of Montpellier, France.

2003-2013 Associated Member, Centre Cavailles, École Normale Supérieure, Paris, France.

2003 Visiting Professor, University of Rennes, France.

1995-1996 Visiting Professor, Department of Radiology and Nuclear Medicine and Department of Nutrition and Bromatology, University of Granada, Spain.

1989 Visiting Professor, The Institute of Pathology, Medical School, University of Oslo, Norway; Astri og Birger Torsteds Legat/Norwegian Cancer Society Fellowship.

1989 Visiting Professor, Department of Nutrition and Bromatology, University of Granada, Spain.

### **AWARDS AND HONORS**

2019 Grand Vermeil Medal of the City of Paris

2017 Recognized in “The Top 50 Women in STEM” (<https://thebestschools.org/features/50-top-women-in-stem/>)

2012 Jacob Heskell Gabbay Award, Brandeis University

2011 Elected Member, Ramazzini College, Bologna, Italy

2004 The Breast Cancer Fund Hero Award, presented by the Breast Cancer Fund of San Francisco

1999 Faculty Recognition Award, Tufts University.

1998-2000 Member, Sigma Xi, 61st College of Distinguished Lecturers.

1995 The Marla Frazin Award, presented by the Massachusetts Breast Cancer Coalition.

### **MAJOR COMMITTEE ASSIGNMENTS/PROFESSIONAL SERVICE**

#### **International, National and Regional Committees**

2020 Member of the Search Committee for the Director of the Institute of Advanced Studies of Nantes, France

2016-present Ad-hoc member of NIH study sections

2013- Member of the Scientific Advisory Board, Food Packaging forum, Zurich, Switzerland.

2007-2008 Member, Strategy Team of the California Breast Cancer Research Program's Special Research Initiatives.

2007-2011 Member, ICER Study Section, NIH.

2001-2007 Member, Advisory Panel, Breast Cancer Watch, Marin County, CA.

2000-2006 Swiss National Science Foundation, Member of the Stirring Committee, National Research Program “Endocrine Disrupting Chemicals in the Environment”.

1998-2001 National Science Foundation, Division of Biological Sciences: Member of the Neuroendocrinology Panel.

1997-1998 Environmental Protection Agency, Endocrine Disrupter Screening and Testing Advisory Committee. Member of the Screening and Testing Work Group appointed by Dr. Lynn Goldman, Assistant Administrator for Prevention, Pesticides and Toxic Substances at the U.S. Environmental Protection Agency, Washington, D.C.

- 1995-1999 National Academy of Sciences, National Research Council. Member of the Committee on Hormone-Related Toxicants in the Environment. The U.S. EPA requested that the NAC Board on Environmental Studies and Toxicology to study the problem and recommend research, monitoring and testing priorities. The NRC appointed this committee to undertake this task.
- 1995-1998 U.S. Department of Health and Human Services. Member of the National Action Plan on Breast Cancer (NAPBC), a panel appointed by the Secretary of Health and Human Services, Donna Shalala, to improve the diagnostic procedures, treatment and prevention of breast cancer.
- 1995-1998 National Action Plan on Breast Cancer (NAPBC). Member, Etiology Working Group. Among the tasks of this committee is to identify areas of research that need to be addressed. This committee has organized workshops and reviewed grant proposals.
- 1991 National Science Foundation, Physiological Processes Program. Member, Committee on Diversity in Biological Research. A report summarizing the recommendations of this committee was published by NSF in 1991.

### Professional Service

- 2019 Assemblée Nationale (French Republic) Testified before a committee on the health effects of chemicals in plastics at the request of a committee of legislators about endocrine disruptors present in plastics (committee presided by Representative. Mr. Michel Vialay, rapporteurs: Representatives Ms. Laurianne Rossi and Ms Claire Pitollat)
- 2018 Assemblée Nationale (French Republic). Testified before a committee on the health effects of chemicals in food contact materials at the request of the Representative Ms Laurianne Rossi.
- 2016- Associated editor and co-founder of the journal ORGANISMS.
- 2014 Senate (French Republic). Public presentation and round table on cancer and endocrine disruptors organized by Senator Chantal Jouanno.
- 2014 Assemblée Nationale (French Republic). Testified before a committee on the health effects of bisphenol-A, at the request of M. G. Bapt and M. JL Roumégas.
- 2014 Member, Editorial Board of Progress in Biophysics and Molecular Biology
- 2010- Assemblée Nationale (French Republic). Testified before a committee on the health effects of bisphenol-A, at the request of M. G. Bapt and Mme B. Paoletti
- 2007-2011 Member, Integrative and clinical endocrinology and reproduction study section, NIH.
- 2004- 2007 Member, Editorial Board of Environmental Health Perspectives
- 1997 Massachusetts Legislature. Testified about estrogenic xenobiotics in food containers and wraps
- 1995 Louisiana Legislature. Testified about estrogenic xenobiotics and breast cancer
- 1995-2005 Member, Editorial Board of Biomarkers
- 1993 U.S. House of Representatives; Committee on Energy and Commerce. Testified about estrogenic xenobiotics and breast cancer before the Subcommittee on Health and the Environment
- 1988- NSF. Ad-hoc reviewer, Cell Biology Program
- 1983- Ad-hoc Reviewer for Science, Endocrinology, Cancer Research, J. of Pathology, The Cancer Journal, Environmental Health Perspectives, etc.

### **Convener/Organizer of Conferences and Symposia**

- 2017 Honorary president and co-organizer of the conference: "Where are the biological sciences going?" October 25-27, Rome.
- 2017 Conference co-organizer: SJ Gould's legacy fifteen years after the publication of his opus magna, *The Structure of Evolutionary Theory*. Centre Cavallès, Ecole Normale Supérieure, Paris, February 22, 2017
- 2017 Conference co-organizer: Endocrine disruptors: a bumpy road to regulation. Centre Cavallès, Ecole Normale Supérieure, April 21, 2017.
- 2015 Closure conference of the Blaise Pascal Chair of Biology 2013: Biological complexity and organization: theoretical approaches and applications (co-organizers: Giuseppe Longo, Barbara Demeneix, Nicole Perret), National Museum of Natural History, May 5-6, Paris, France.
- 2015 Symposium on Development, Evolution and Cancer honoring Carlos Sonnenschein on his 80th birthday (Co-organizer Al Gustafson), Tufts University, School of Medicine, Feb 3, Boston.
- 2014 Symposium on Biological Complexity honoring Carlos Sonnenschein on his 80th birthday (co-organizers: Barbara Demeneix and Giuseppe Longo), National Museum of Natural History, December 5, Paris, France.
- 2012 Workshop on biological organization, National Museum of Natural History (co-organizer: Barbara Demeneix), September 7, Paris, France.
- 2002 Chair, Gordon Conference on Environmental Endocrine Disruptors, July 14-19, South Hadley, MA.
- 2002 Co-Organizer, Conference on Endocrine Disruptors sponsored by the Swiss National Science Foundation. Zuerich, April 21-22.
- 2002 Co-Organizer, Tufts University 150<sup>th</sup> Anniversary Symposium "The Philosophical Bases of Biological Thought", Boston, April 16.
- 2000 Vice-Chairperson, Gordon Conference on Environmental Endocrine Disruptors, June 18-23, Plymouth, NH.
- 1999 Convener, NAPBC-Sponsored Conference on "The role of Tissue Architecture on Breast Cancer." September 16-17, Washington, D.C.
- 1989 Co-organizer, NCI-Sponsored Conference on the Control of Cell Proliferation, October 12-14, Cambridge, MA.

### **Lay Press/Public Education**

- 2021 Featured in the documentary "We the Guinea Pigs" (Producer: Louise Unmack Kjeldsen) for the Danish TV chain.
- 2020 Featured in the documentary "Manufacturing Ignorance" (Producers: Franck Cuveillier and Pascal Vasselin).
- 2019 Interview about Endocrine Disruptors with Mathieu Vidard Radio France Inter / La Terre au Carré, October 15.
- 2019 Interview about Endocrine Disruptors, TV program "Escala en París" Radio France International/France 24, July 17.
- 2014 Featured on a documentary on cancer for the French –German television (Arte). Producers: Anne Laure de Laval and Marie-Pierre Jaury.
- 2011 Featured in the documentary "The great invasion" (Producer: Stephane Horel).

- 2008           Featured in the documentary "Males in peril" (Producers: Sylvie Gilman and Thierry de Lestrade).
- 2006           Featured in the documentary "The war on cancer" (Producers: Sylvie Gilman and Thierry de Lestrade).
- 2000           Featured in a documentary by the Danish Broadcasting Corporation (Producer: Hans Bulow).
- 1999-2002    Opinion pieces on science and policy, International Herald Tribune
- 1997           Featured in a documentary by the Public Television Service of Japan (NHK).
- 1997           Featured in a documentary about endocrine disruptors, an episode of "The Nature of Things" series produced by David Suzuki for the Canadian Broadcasting Corporation.
- 1995           Featured in a BBC documentary on the impact of environmental estrogens on male reproduction and breast cancer for "Horizon;" Producer: Deborah Cadbury. Broadcast date on BBC-2: 02/26/96.
- 1994           Featured in a Canadian Broadcasting Corporation documentary "Sex Under Siege" for the series "Witness." Producer: Jerry Thompson. Broadcast date: 10/21/94.
- 1994           Featured in a Danish Television documentary on the impact of estrogens on male reproduction
- 1994           Featured in CBS's "Eye to Eye with Connie Chung." Documentary on estrogens released from plastic into food. Broadcast date: 7/28/94.
- 1993           Featured in a BBC documentary "Assault on the male" for "Horizon;" Producer: Deborah Cadbury. Broadcast date on BBC-2: 10/31/93.
- 1993           Interviews about our research on various aspects of hormone-related chemicals in various newspapers and magazines (Science News, The Washington Post, The New York Times, The Boston Globe, Newsday, Geo).

## **POSTDOCTORAL TRAINING**

### **Postdoctoral Fellows**

- 2012-2014    Tessie Paulose, PhD. University of Illinois, Urbana, IL.
- 2012-2013    Maël Montévil, PhD, École Normale Supérieure and U. Paris, France
- 2011-2015    Nicole Acevedo, Ph.D., University of Michigan, Ann Arbor, MI
- 2010-2017    Lucia Speroni, Ph.D, Quilmes University, Buenos Aires, Argentina
- 2007-2010    Adeline Cabaton, Ph.D, Université de Dijon, France
- 2007-2010    Nicolas Cabaton, Ph.D., Université de Dijon, France
- 2007-2010    Eugen Dhimolea, Ph. D. University of Athens, Greece
- 2005-2007    Tessa J. Murray, Ph.D., University of Aberdeen, Aberdeen Scotland
- 2003-2013    Perinaaz R. Wadia, Ph.D., University of Mumbai, India
- 2001-2003    Noemi Custodia Lora, Ph.D., Boston University, Boston, MA
- 1999-2004    Maricel Maffini, PhD., University of the Littoral, Santa Fe, Argentina
- 1998-2003    Caroline M. Markey, Ph.D., University of Western Australia, Australia
- 1995-1996    Jesus Jimenez, Ph.D., Fellow of the Ramon Areces Foundation, Spain
- 1994-2000    Peter Geck, M.D., Emelweis University, Budapest, Hungary
- 1991-1997    Jozsef Szelei, Ph.D., Attila University, Szeged, Hungary
- 1988-1989    Honorato Justicia, Ph.D., University of Granada, Spain

## Visiting Professors

2017	Amalia Rubio, Ph.D, Professor, University of Seville, Spain
2005	Mariana Fernandez, University of Granada, Spain
2003	Sandro Rusconi, Ph.D. Professor, Fribourg University, Switzerland
2001-2002	Pat Molinero, Ph.D, Professor, university of Seville, Spain
1995	Wolfgang Körner, Ph.D., Assistant Professor, Tübingen University, Germany
1993-1995	Fatima Olea-Serrano, Ph.D., Professor, University of Granada, Spain
1994	Rosa Pulgar-Encinas, MD., Assistant Professor, University of Granada, Spain
1993	Mercedes Villalobos, MD., Assistant Professor, University of Granada, Spain
1987	Fatima Olea-Serrano, PhD., Professor, University of Granada, Spain

## TRAINING OF GRADUATE STUDENTS

### Thesis Director

2014- 2019	Nafis Hasan, Ph.D. Tufts University
2013-2018	Michael Sweeney, Ph.D. Tufts University
2007-2011	Steven Pageau, Ph.D. Tufts University
2004-2008	Silva Krause, Ph.D. Tufts University
2003-2007	Laura Vandenberg, Ph.D. Tufts University
2000-2001	Silva Krause DAAD- German Academic Exchange Service- Fellow (M.S. Thesis, Fachhochschule Ostfriesland, Germany. Advisor: Marinus Meiners).
1999-2000	Monika Lusser. (M.S. Thesis, Department of Pharmacology, University of Zurich, Switzerland. Advisor: Margret Schlumpf).
1998-1999	Christian Helbig, M.S. Carl Duisberg Gesellschaft e.V. Fellow (M.S. Thesis, Fachhochschule Ostfriesland, Germany. Advisor: Marinus Meiners).
1996-2000	B. Rey De Castro (Thesis Co-Director: Jack Spengler), Harvard School of Public Health, Boston, MA
1996-1997	Nils Rutsch, M.S. Carl Duisberg Gesellschaft e.V. Fellow (M.S. Thesis, Fachhochschule Ostfriesland, Germany. Advisor: Marinus Meiners).
1993-1999	Mariana Fernandez, M.S. (Ph.D. Thesis Co-Director: Fatima Olea-Serrano, Department of Bromatology, University of Granada, Spain).
1993-1995	Jose Antonio Brotons, Ph.D. (Ph.D. Thesis Co-Director: Fatima Olea-Serrano, Department of Bromatology, University of Granada, Spain).
1985-1986	Jean-Luc Reny, M.D. (M.S. Thesis Co-Director: D.C. Gautheron, Claude Bernard University, Lyon, France).

### Thesis Advisor

1999-2006	Danielle Grove-Strawser, (Thesis director: Beverly S. Rubin) Tufts University
1998-2000	Erica Marieb (Ph.D.Thesis Director: Bryan Toole), Tufts University
1993-1996	Blanca Valenzuela, Ph.D. (Thesis Director: Fatima Olea-Serrano), University of Granada, Spain
1993-1996	Beatriz Cabrera, M.D., Ph.D. (Thesis Director: Pablo Torme), University of Granada, Spain
1990-1995	Mimi DeSouza, Ph.D. (Thesis Director: Mary K. Murray), Tufts University.
1990-1995	Jill Sible, Ph.D. (Thesis Director: Noelynn Oliver), Tufts University.
1985-1992	Tien-Min Lin, Ph.D. (Thesis Director: Carlos Sonnenschein), Tufts University.
1980-1985	Robert Schatz, Ph.D. (Thesis Director: Carlos Sonnenschein), Tufts University.

## TEACHING RESPONSIBILITIES

### Professional Schools

- 2020- Course Director, “Developmental Origin of Adult Diseases”, Master Program on Biomedical Sciences, Tufts University School of Medicine.
- 2013- Instructor, Dental Histology course, Department of Integrative Physiology and Pathobiology.
- 1995-1996 Course Director, Dental Histology course, Department of Anatomy and Cellular Biology.
- 1985-1990 Facilitator, Problem-based learning program at Tufts Medical School.
- 1979- Lecturer on Endocrinology and Female Reproductive System, Dental Histology course, Department of Anatomy and Cellular Biology.
- 1979- Instructor, Dental Histology Course, Department of Anatomy and Cell Biology.
- 1969-1970 Director of the training course for Teaching Assistants in Human Physiology, University of Buenos Aires, Argentina.

### Graduate School

- 1993-1995 Lecturer, Developmental Biology Course (Cell 294B).
- 1992-2000 Co-Director, Course on Cell Proliferation, Differentiation and Cancer (Cell 251).

**MAJOR RESEARCH INTERESTS:** My research encompasses theoretical and experimental biology.

**Theoretical Biology:** While writing a book on cell proliferation and cancer (C. Sonnenschein and A.M. Soto, “The Society of Cells” published in 1999), we realized how little, if any of the theoretical content of research is made explicit by the biologists working in these areas of research. Extracting the hidden assumptions from these research papers was indeed quite difficult. This activity prompted my interest in this subject and during my 2003 sabbatical at the Centre Cavallès (École Normale Supérieure, Paris, France) I started to work on epistemological issues in cancer research and in organismal biology. From these activities I started a strong collaborative project with Prof. G. Longo (Centre Cavallès) a mathematician and theoretical biologist, Prof. P.-A. Miquel (Univ. Toulouse, France), a philosopher of science and Dr. C. Sonnenschein.

*Principles for a theory of organisms:* Since 2013, as incumbent of the Blaise Pascal Chair of Biology my main theoretical goal is to develop a theory of organisms that acknowledges the purposiveness, agency and normativity of organisms. For this purpose, the group previously formed at Cavallès acquired new members, Drs. Matteo Mossio (philosopher), Dr. Arnaud Pocheville (biologist), and Dr. Maël Montévil (mathematician). The three theoretical principles guiding our research are: 1) the “default state”, 2) organization and 3) variation (Soto AM, Longo G, Noble D, editors. *Prog Biophys Mol Biol.* 2016;122:1-81). These principles provide guidance for our biological experiments and for mathematical modeling of organogenesis and carcinogenesis.

*The biological default state:* We were inspired by the central role the principle of inertia to the modern scientific revolution. Inertia, the default state in mechanics, represented a major theoretical commitment: we do not need to explain uniform rectilinear motion, rather, we need to explain departures from it. By analogy, we propose a biological default state of proliferation with variation and motility. From this theoretical commitment, what requires explanation is proliferative quiescence, lack of variation, lack of movement.

*A new theory of carcinogenesis:* The basic premises of the tissue organization field theory of carcinogenesis and neoplasia are: 1) the default state is proliferation and motility, and 2) carcinogenesis and neoplasia are defects of tissue architecture. Carcinogens act by disrupting the normal interactions that take place among cells in the parenchyma and stroma of an organ (the equivalent of the “morphogenetic fields” of developing organisms).

**Experimental biology:** My research interests have centered on the control of cell proliferation by sex steroids, the developmental origins of adult disease, particularly the role of endocrine disruptors on carcinogenesis, reproduction and obesity, the role of stroma/epithelial interactions on organogenesis and carcinogenesis and the role of biomechanics on morphogenesis.

*Morphogenesis:* We developed 3D culture models of the breast to study the reciprocal cell-cell and cell-matrix interactions that result in normal tissue structure and their breakdown during carcinogenesis, as well as the role of mammatropic hormones in morphogenesis and neoplasia. Additionally, we are studying the role of physical forces as determinants of form and function. We recently developed a mathematical model by which “predictive” *in silico* experiments inform the design of experiments in the *in vitro* 3D-culture model.

*Carcinogenesis and normalization:* Using a theory-neutral experimental strategy, we observed that the recombination of stroma exposed to a carcinogen with normal epithelial cells resulted in neoplasms. The reverse combination did not. This observation is consistent with the tissue organization field theory and inconsistent with the somatic mutation theory. It suggests that the stroma, rather than individual cells in the epithelium, is the target of the carcinogen, and points to the contextuality of the neoplastic phenotype. Conversely, we found that mammary gland stroma from mature and multiparous rats prevents neoplastic development and encourages normal ductal growth of grafted epithelial cancer cells, while the stroma from rats undergoing puberty developed tumors. The tumor development pattern suggests a parallel to the phenomenon of age- and reproductive state-dependent susceptibility and resistance to chemical carcinogens. As susceptibility to carcinogenesis decreases, the ability of the stroma to normalize neoplastic epithelial cells increases.

*Endocrine disruptors and fetal origins of adult disease:* This topic was developed because of the accidental finding in our laboratory that plasticware used in routine experimental procedures leached estrogenic chemicals. This initial finding plus the research program they generated has had numerous ramifications, from the very emergence of the concept of ENDOCRINE DISRUPTION and a field of research devoted to it, to legislation banning the use of BPA in baby bottles. Our research is designed to identify the links between the increasing incidence in humans of diseases and conditions like reproductive impairment, cancer, obesity, diabetes and altered behaviors and exposure to environmental endocrine disruptors.

## **BIBLIOGRAPHY**

### **Experimental Research**

1. Gomez, C.J., Duvilanski, B.H., Guglielmone, A.E.R. and Soto, A.M. Effect of neonatal thyroidectomy upon nuclear and microsomal RNA synthesis in developing rat brain. *Gene Expression and Its Regulation*, Plenum Press, 179-188, 1972.
2. Gomez, C.J., Duvilanski, B.H., Soto, A.M. and Guglielmone, A.E.R. Hormonal regulation of brain development. VI - Kinetic studies of the incorporation *in vivo* of (<sup>3</sup>H) orotic acid into RNA of brain subcellular fractions of 10-day-old normal and hypothyroid rats. *Brain Research* 44: 231-243, 1972.



3. Guglielmone, A.E.R., Soto, A.M., Gomez, C.J. and Duvilanski, B.H. Neonatal malnutrition and RNA synthesis in developing rat brain. *J Neurochem* 22: 529-533, 1974.
4. Soto, A.M., Duvilanski, B.H. and Guglielmone, A.E.R. Comparison of *in vivo* incorporation of labelled precursors into cerebral RNA of developing rats. *Neurobiology* 4: 277-285, 1974.
5. Sonnenschein, C., Weiller, S., Farookhi, R. and Soto, A.M. Characterization of an estrogen-sensitive cell line established from normal rat endometrium. *Cancer Res* 34: 3147-3154, 1974.
6. Sonnenschein, C., Soto, A.M., Colofiore, J., Farookhi, R. Estrogen target cells: establishment of a cell line derived from the rat pituitary tumor MtT/F4. *Exp Cell Res* 101: 15-22, 1976.
7. Sonnenschein, C. and Soto, A.M. Pituitary uterotrophic effect in the estrogen dependent growth of the rat uterus. *J Ster Biochem* 9: 533-537, 1978.
8. Soto, A.M. and Sonnenschein, C. Estrogen receptors in estrogen sensitive cells in culture. *J Ster Biochem* 11: 1185-1190, 1979.
9. Sonnenschein, C. and Soto, A.M. Growth inhibition of estrogen-sensitive tumor cells in newborn rats. In *Carcinoembryonic Proteins*. L.G. Lehmann, ed. Vol. 2:895-900. Elsevier-North Holland, Amsterdam, The Netherlands, 1979.
10. Sonnenschein, C. and Soto, A.M. Growth inhibition of estrogen-sensitive tumor cells in newborn rats. Probable role of alpha-fetoprotein. *J Natl Cancer Inst* 63: 835-841, 1979.
11. Sonnenschein, C., and Soto, A.M. But...are estrogens per se growth promoting hormones? *J Natl Cancer Inst* 64: 211-215, 1980.
12. Sonnenschein, C., Ucci, A.A., and Soto, A.M. Inhibition of growth of transplantable rat mammary tumors: probable role of alpha-fetoprotein. *J Natl Cancer Inst* 64: 1141-1146, 1980.
13. Sonnenschein C., Ucci, A.A., and Soto, A.M. Growth inhibition of estrogen-sensitive rat mammary tumors: effect of an alpha-fetoprotein secreting hepatoma. *J Natl Cancer Inst* 64: 1147-1152, 1980.
14. Soto, A.M., and Sonnenschein, C. Growth control of estrogen sensitive cells: role for alpha-fetoprotein. *Proc Natl Acad Sci USA* 77: 2084-2087, 1980.
15. Sonnenschein, C., Lee, H. and Soto, A.M. A novel "in animal - in culture" system to monitor the effects of antiestrogens on estrogen-target cells. In: *Current Chemotherapy and Infectious Diseases*, A.S.M. Washington, D.C. pp. 1681-1682, 1980.
16. Lee, H., Davies, I.J., Soto, A.M. and Sonnenschein, C. Estrogen induction of progesterone receptor and its relationship to cell multiplication rate in the rat pituitary tumor cell line C29RAP. *Endocrinology* 108: 990-995, 1981.
17. Sonnenschein, C. and Soto, A.M. Cell multiplication in metazoans: Evidence for negative control of initiation in rat fibroblasts. *Proc Natl Acad Sci USA* 78: 3702-3705, 1981.
18. Laugier, C., Pageaux, J.F., Sonnenschein, C., Claustrat, B., Soto, A.M., Brard, E. and Pacheco, H. Oestradiol et multiplication cellulaire: mise en evidence d'un effet indirect. *CR Acad Sci (Paris)* 294: 31-34, 1982.
19. Schatz, R.W., Laugier, C., Soto, A.M. and Sonnenschein, C. Serum alpha-fetoprotein levels and the ontogeny of estradiol 17-sensitive proliferation in the Syrian hamster uterus. *Biol Reprod* 28: 1148-1154, 1983.

20. Laugier, C., Pageaux, J.F., Soto, A.M. and Sonnenschein, C. Mechanism of estrogen action: indirect effect of estradiol-17 on the proliferation of quail oviduct cells. *Proc Natl Sci USA* 80: 1621-1625, 1983.
21. Soto, A.M., Lee, H., Siiteri, P. and Sonnenschein, C. Estrogen induction of progestophilins in genuine estrogen-sensitive tumor cells under conditions resembling the perinatal state in rats. *Expt Cell Res* 150: 390-399, 1984.
22. Soto, A.M. and Sonnenschein, C. Mechanism of estrogen action on cellular proliferation: evidence for indirect and negative control on cloned breast tumor cells. *Biochem Biophys Res Commun* 122: 1097-1103, 1984.
23. Schatz, R.W., Soto, A.M. and Sonnenschein, C. Estrogen-induced cell multiplication: direct or indirect effect on rat uterine cells. *Endocrinology* 115: 501-506, 1984.
24. Soto, A.M. and Sonnenschein, C. The role of estrogens on the proliferation of human breast tumor cells (MCF-7). *J Steroid Biochem* 37: 87-94, 1985.
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26. Schatz, R.W., Soto, A.M. and Sonnenschein, C. Interaction between estradiol-17 and progesterone on the proliferation of cloned breast tumor cells (MCF7 and T47D). *J Cell Physiol* 124: 386-390, 1985.
27. Papendorp, J.T., Soto, A.M. and Sonnenschein, C. On the role of 17 alpha-estradiol and 17 beta-estradiol in the proliferation of MCF7 and T47D-A11 human breast tumor cells. *J Cell Physiol* 125: 591-595, 1985.
28. Soto, A.M., Murai, J., Siiteri, and Sonnenschein, C. Control of cell proliferation: evidence for negative control on T47D human breast tumor cells. I. Contrasting effects of serum-less and serum-supplemented medium. *Cancer Res* 46: 2271-2275, 1986.
29. Soto, A.M., Bass, J.C. and Sonnenschein, C. Estrogen-sensitive proliferation pattern of cloned Syrian hamster kidney tumor cells. *Cancer Res* 48: 3676-3680, 1988.
30. Reny, J-L. and Soto, A.M. Human serum does not contain a high affinity estrogen-binding factor different from sex hormone-binding globulin. *J Clin Endocrinol Metabol* 68: 938-945, 1989.
31. Sonnenschein, C., Olea, N., Pasanen, M.E. and Soto, A.M. Negative controls of cell proliferation: human prostate cancer cells and androgens. *Cancer Res* 49: 3474-3481, 1989.
32. Olea, N., Sakabe, K., Soto, A.M. and Sonnenschein, C. The proliferative effect of "anti-androgens" on the androgen-sensitive human prostate tumor cell line LNCaP. *Endocrinology* 126: 457-463, 1990.
33. Soto, A.M., Wray, J., Justicia, H. and Sonnenschein, C. p-Nonyl phenol: an estrogenic xenobiotic released from modified polystyrene. *Environ Health Perspect* 92: 167-173, 1991.
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#### **Theoretical work**

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### Invited Reviews, Guest Editorials and Commentary

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### **Book Chapters**

1. Sonnenschein, C. and Soto, A.M. Mechanism of estrogen action: the old and new paradigm. In: *Symposium of "Estrogens in the Environment,"* edited by J. McLachlan, Elsevier/North Holland, Amsterdam, pp. 169-197, 1980.

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10. Sonnenschein, C., and Soto, A.M. Reflections on bioanalytical techniques for detecting endocrine disrupting chemicals, In Nicolopoulou-Stamati P, Hens L, Howard CV (eds): *Endocrine Disrupters: Environmental Health and Policies*, Dordrecht, pp 21-38, 2001.
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#### **Books Edited/Authoried**

1. Soto, A.M., Sonnenschein, C. and Colborn, T. Guest Editor, Special Issue: Endocrine Disruption and Reproductive Effects in Wildlife and Humans. In: Comments on Toxicology, edited by A. Wallace Hayes, Overseas Publishers Association, Amsterdam, 5(4-5): 315-506, 1996.
2. Sonnenschein, C. and Soto, A.M. The Society of Cells: Cancer and the Control of Cell Proliferation. Bios Publishing Co., Oxford, U.K./ Springer-Verlag, New York, 1999.
3. Sonnenschein, C. and Soto, A.M. La Société des Cellules: Nouvelle approche du cancer. Editions Sylepse, Paris, 2006.
4. Sonnenschein, C. and Soto, A.M. La Sociedad de las células. Ediciones EUDEBA, Buenos Aires, 2019.

#### **Patents**

1. Sonnenschein, C. and Soto A.M. In-Vitro Methods for Identifying Compositions which are Agonists and Antagonists of Estrogens. Patent Number: 4,859,585, Issued: August 22, 1989.
2. Soto, A.M. and Sonnenschein, C. In-Vitro Methods for Identifying Compositions which are Agonists and Antagonists of Androgens. Patent Number: 5,135,849, Issued: August 4, 1992.
3. Soto, A.M. and Sonnenschein, C. Inhibiting Proliferation in Cells. USSN # 6,274,305 Issued: August 14, 2001.
4. Soto, A.M., Sonnenschein, C., Geck, P. and Szelej, J. A Novel Androgen-Induced Suppressor of Cell Proliferation and Uses Thereof. USSN #6,994,992, Issued February 7, 2006.

#### **Seminars, Symposium Presentations. Workshops (partial list-last 7 years).**

- 2013 NIEHS BPA Consortium, Research Triangle Park, NC, January 28.
- 2013 Women's Health Working Group, sponsored by NIEHS, Research Triangle Park, NC, January 29.
- 2013 Session chair, Environmental Health, Boston MA, March 3-6.
- 2013 Seminar Speaker "Formulating a systems approach to endocrine disruption" National Hospital, Copenhagen, Denmark, April 29.
- 2013 Speaker, European Society of Endocrinology, Annual Meeting in Copenhagen, Denmark, April 30.
- 2013 Speaker "Environmental Causes of Cancer: Endocrine Disruptors as Carcinogens" at the mini-symposium on "Developmental Origins of Endocrine Disorders: Impacts of Environmental Exposures" Endocrine Society Annual Meeting, San Francisco, CA June 18.
- 2013 Symposium co-organizer and speaker "Theory of Organisms", meeting of the International Society for History, Philosophy, and Social Studies of Biology, Montpellier, France, July 7-12.
- 2013 Seminar speaker "Carcinogenesis as development gone awry", Centre de Recherche des Cordeliers, Paris, France, September 20.
- 2013 Speaker at the "Endocrine Disruptors and Reproductive Health Across the Lifespan" symposium, American Society for Reproductive Medicine, Boston, MA, October 14.



- 2013 Speaker at the symposium "Cancer research: a privileged field of investigation on chance, reductionism and holism", Centre Cavailles, Ecole normale superieure, Paris France, November 7.
- 2013 Seminar Speaker "Aspects d'une théorie de l'organisme", Department of Philosophy, Université de Toulouse-Mirail, France, November 13.
- 2013 Seminar speaker "Organisation biologique: l'intégration des paramètres physiques dans la morphogenèse et la carcinogenèse", Seminar Series ".Les Jeudis de l'histoire et de la philosophie des sciences, Ecole normale superieure, Paris France December 5.
- 2013 Keynote Speaker, Colloque Santé-Environnement, Conseil Régional de Picardie, Amiens, December 6-7.
- 2014 Seminar Speaker "Toward a theory of organisms" Seminar Series of the Institut d'histoire et de philosophie des sciences et des techniques, Paris, France February 20.
- 2014 Joint Seminar with Carlos Sonnenscheein «From the cell to cancer: An evolutionary perspective of development and cancer» Institut d'Etudes Avancées de Nantes, March 11.
- 2014 Seminar Speaker "Toward a theory of organisms", Center for Theoretical Biology, Peking University, China, April 21.
- 2014 Speaker Environmental Endocrine Disruptor Gordon Research Conference, Il Ciocco, Tuscany, Italy, May 11-16.
- 2014 Speaker, "Le syndrome d'exposition fetale aux xenoestrogenes" Assemblée Nationale, Paris, France, June 11.
- 2014 Seminar Speaker, "Toward a theory of organisms", seminar series at the Institut des Hautes Études Scientifiques, bures-sur-Yvette, France, July 4.
- 2014 Seminar Speaker "Endocrine disruptors: science and policy" School of Medicine, University of Buenos Aires, Argentina. August 13.
- 2014 Public conference « Cancers hormono-dépendants et Perturbateurs Endocriniens », French Senate, Paris October 29.
- 2015 Seminar Speaker "Formulating a systems approach to endocrine disruption", University of California at Irvine, January 29.
- 2015 Seminar Speaker, « L'état par défaut en biologie : prolifération avec variation et Motilité ». University of Nantes, April 10
- 2015 Joint seminar with Mael Montevil: « Chemins vers une théorie des organismes », université de Nice, April 20.
- 2015 Joint seminar with Carlos Sonnenschein Seminar speaker "Carcinogenesis as development gone awry", Institute Gustave Roussy, Paris, France June 4
- 2015 Keynote Speaker ' « Bisphénol A et Troubles du comportement » at the colloquium « Les Pathologies Neuro-développementales et l'Environnement », French Assemblée Nationale, Paris, France, June 18.
- 2015 Speaker at the workshop "Food packaging and chemical safety: What does the future hold?" Zurich, Switzerland, October 8.
- 2016 Speaker at the Tata Medical Center Platinum Jubilee Celebration "A conference of New Ideas in Cancer- Challenging dogmas" Mumbai, India, February.

- 2016 Speaker at the Cell Press/AWIS/MIT meeting: 'The Science of Gender, and the Gender of Science', MIT, Cambridge, MA, May 19.
- 2016 Speaker at the « Conférence à la Cour de cassation sur la gouvernance des risques incertains, l'exemple des perturbateurs endocriniens » July 7.
- 2016 Speaker, Conference on Stability and Variation, San Sebastian, Spain, July 4-6,
2016. Session leader, Gordon Research conference on Environmental Endocrine disruptors Sunday River Newry, ME.
- 2016 Keynote Speaker, Eurotox, Seville Spain, September 4-7.
- 2016 Speaker, conference "Sciences of life, sciences of information", held at the International cultural Center of Cerisy, Chateau de Cerisy, Cerisy-la-Salle, France, September 17-24.
- 2016 Seminar Speaker, Cancer Center, Chonnam University, Gwangju, Korea, September 28.
- 2016 Seminar Speaker, MRC Center, Chosun University, Gwangju, Korea, September 29.
- 2016 Speaker, 4th International Symposium -Biophysical Aspects of Complexity in Health and Disease. Lugano -Switzerland October 22.
- 2017 Speaker at the symposium 'ONE HEALTH Epigenomics & Microbiomes: From Soil to People' Symposium, Sheraton Framingham Hotel & Conference Center, March 16-18.
- 2017 Speaker at the conference Endocrine disruptors: a bumpy road to regulation. Centre Cavallès, Ecole Normale Supérieure, Paris, April 21.
- 2017 Speaker at the conference "Chemical Entanglements" UCLA, May 4-7,
- 2017 Speaker at the symposium: The male mammary gland. Species Differences in Mammary Gland Development and Susceptibility to Environmental Chemicals, Teratology Society, Denver, CO, June 26.
- 2017 Organizer of the Session: Toward a Theory of Organisms: Two Proposals and Three Aims: Using the Theory to Construct Objectivity, Provide Intelligibility and Frame Observations and Experiments. ISHPSSB, Sao Paulo, Brazil July.
- 2017 Speaker at the international society for the history, philosophy and social studies of biology (ISHPSSB): Principles for a Theory of Organisms, Sao Paulo, Brazil, July.
- 2017 Speaker at the International Workshop « Organization as a Theoretical Principle for the Life Sciences », Institut d'Histoire et de Philosophie des Sciences et des Techniques, Paris, September 27-28.
- 2017 Speaker at the Conference: where are the biological sciences going? October 25-27, Rome.
- 2018 Speaker at the Conference "Process Biology" Sponsored by U. Exeter, London, March 21-23.
- 2018 Speaker at the "Workshop on deep evolutionary roots of cancer" a per invitation only meeting at the "Beyond Center" at Arizona State University, April 23-25.
- 2018 Keynote Speaker at the Gordon Research Conference on Environmental Endocrine Disruptors, Les Diablerets, Switzerland, June 3-8.
- 2018 Keynote speaker at the 2<sup>nd</sup> European Meeting "Villes et Territoires sans Perturbateurs Endocriniens " Paris, September 22.

- 2018 Speaker at the symposium “Carcinogenesis: Bad Luck, Bad Genes, Bad Environment, or Something Else?” -The 49th annual meeting of the Environmental Mutagenesis and Genomics Society (EMGS) San Antonio, TX, September 22-26.
- 2019 Seminar Speaker: Principles for a Theory of Organisms, Ecole Normale Superieure, Feb 7.
- 2019 Speaker at the World Aquaculture Society Conference, New Orleans, March 10.
- 2019 Speaker at the Symposium “Endocrine Disrupting Chemicals from Top to Bottom, Annual Endocrine Society Conference, New Orleans, March 25.
- 2019 Keynote Speaker at the conference "Perspectives on Ecological Integrity in Science and Law", Trieste, June 24-29.
- 2019 Speaker at the session “Precision biology: concepts and measurements”, international society for the history, philosophy and social studies of biology (ISHPSSB), Oslo, July 10.
- 2019 Seminar speaker: Biology in crisis: is there light at the end of the tunnel? Centro de Estudios Farmacológicos y Botánicos (CEFYBO)-UBA-CONICET, Medical School, University of Buenos Aires, August 13.
- 2019 Seminar speaker: “The society of cells: cancer and the control of cell proliferation”. Academia de Medicina, Buenos Aires, August 16.
- 2019 Speaker, “Cancer du Sein et Environnement », Salle de Fêtes, Mairie du 10<sup>ème</sup>, Paris, October 17.
- 2019 Speaker at the “Improving the chemical safety of food contact articles: Accelerating science and innovation” workshop, Food Packaging Forum, Zurich, Switzerland, October 24.
- 2019 Seminar Speaker, Carcinogenesis explained within the context of a theory of organisms, Institute of Neurociences, Universidad de Alicante, Spain, Nov 15.
- 2019 Keynote Speaker, Public Forum about Endocrine Disruptons, Conseil départemental de la Haute-Garonne, October 28.
- 2019 Seminar Speaker, Carcinogenesis explained within the context of a theory of organisms, Philosophy in Biology and Medicine, University of Bordeaux, France, Dec 12.
- 2019 Speaker, Conference on Endocrine Disruptors, Cantine sans plastiques, City Hall Bordeaux, Dec 13.
- 2019 Speaker “The impoverishment of the scientific mind”, at the conference LES ENTRETIENS DU NOUVEAU MONDE INDUSTRIEL The Centre Pompidou, Dec 17.
- 2020 Speaker “Theorizing endocrine disruption” lecture at a virtual conference organized by Maël Montévil, Institut de Recherche et d'Innovation, Paris May 20.
- 2020 “A Combined Morphometric and Statistical Approach to Assess Nonmonotonicity in the Developing Mammary Gland of Rats in the CLARITY-BPA Study.” Virtual seminar series FPF, May 26.
- 2020 Speaker, at “Data integration, analysis, and interpretation of eight academic CLARITY-BPA studies” a virtual conference organized by Jerry Heindel, Collaborative on Health and the Environment, July 21.
- 2020 Keynote speaker « Étude Clarity-BPA: approche morphométrique & statistique combinée pour évaluer les réponses non monotones » ARET Rennes October 22-23 (moved to virtual).

- 2020 Speaker: « Les perturbateurs endocriniens : de la découverte accidentelle d'oestrogènes dans les plastiques au syndrome d'exposition au BPA », Bordeaux, November 13 (moved to virtual).
- 2020 Speaker “Computational “horror-scopes”: from the impoverishment of the biological mind to precision medicine”, lecture at a virtual conference organized by G. Longo and M. Montévil, Institut d' Études Avancées, December 4, Nantes.
- 2020 Speaker, “From experimental carcinogenesis to a theory of organisms... and back” Seminar series of the Centre Cavallès, École Normale Supérieure, December 9, on line.
- 2021 Seminar Speaker “Does carcinogenesis start in the womb? Endocrine disruptors and breast cancer” Massachusetts breast Cancer Coalition, March 3, on line.
- 2021 Panel: “Biological Autonomy: Can Machines Come Alive?” The Royal United Services Institute for Defence and Security Studies” (RUSI) conference, July 2.
- 2021 Session co-organizer and speaker “Wingspread @30”, ISHPSSB Biennial Meeting, July 15 and 19.
- 2021 Seminar speaker “Carcinogenesis: an organicist perspective, ” National Cancer Institute Division of Cancer Epidemiology and Genetics. August 26, on line.
- 2021 Collegium Ramazzini, Annual meeting of the Ramazzini Fellows Toxicity of fluoride co-chair of the session entitled: “Toxicity of fluoride”, October 29 on line.
- 2021 Speaker “Endocrine Disruptors: from theoretical and experimental biology to a public and environmental health policy”, at the « Colloque international -Recherche(s), santé et environnement, xixe-xxie siècle » organisé par le Comité pour l’histoire de l’Inserm en partenariat avec Université de Paris, Sorbonne Université et l’UMR SIRICE, November 16-17, Amphithéâtre Buffon, UP, Paris, France.
- 2021 Speaker «La transition santé – maladie ». Journée d’études consacrée à Georges Canguilhem, La philosophie et ses dehors, November 20, théâtre des 3 Ponts, Castelnaudary, France.
2021. Speaker « Les perturbateurs endocriniens et les origines développementales du cancer du sein », Journée scientifique "Cancers des Tissus Hormono-dépendants" du Cancéropôle Grand Ouest, l'IRS-UN à Nantes. December 8, Nantes, France.
- 2021 Speaker “Towards the understanding of biological causality and its application to endocrine disruption”, European Network of Scientists for Social and Environmental Responsibility, conference: “Context, Causality and Consequences: from robust evidence to timely action in biology, ecology, law and public policy” November 26 - 27, Bern, Switzerland.

**The following conferences have been suspended until the covid-19 pandemic allows meetings in person:**

- 2020 Workshop: Humans and Other Agents, co-organizer and speaker, Institute for Advanced Studies, Paris, May 6 and 7.
- 2020 Speaker, Workshop “Theoretical aspects of Endocrine Disruption” École Normale Supérieure, May 12.
- 2020 Speaker “Hindering Metaphors”. Homage to Evelyn Fox-Keller, University of Toronto, May 22-23.