

CURRICULUM VITAE

Date: 1/27/2020

Name: Mark E. Sobel, MD, PhD

Date and Place of Birth: April 14, 1949; Brooklyn, New York

Citizenship: United States

Education:

- 1970 - BA, Brandeis University
- 1975 - MD, Mount Sinai School of Medicine
- 1975 – PhD, (Biomedical Sciences), City University of New York
- 1976 - Diplomate, National Board of Medical Examiners
- 2019 – Certificate, World Art History Program, Smithsonian Associates

Brief Chronology of Employment:

- 1971-1975 Research Assistant, Department of Biochemistry, Mount Sinai School of Medicine
- 1974-1975 Lecturer, Biochemistry Clinical Correlates Course, Mount Sinai School of Medicine
- 1975-1976 Intern in Medicine, Children's Hospital Medical Center, Boston; Clinical Fellow in Pediatrics, Harvard University
- 1976-1981 Research Associate, Laboratory of Molecular Biology, National Cancer Institute, NIH
- 1979-1980 Visiting Scientist, Department for Connective Tissue Research, Max Planck Institute for Biochemistry, Martinsried bei Munchen, West Germany
- 1981-1983 Research Associate, Laboratory of Developmental Biology and Anomalies, National Institute of Dental Research, NIH
- 1983-1992 Senior Investigator, Laboratory of Pathology, National Cancer Institute, NIH
- 1992-2001 Chief, Molecular Pathology Section, Laboratory of Pathology, National Cancer Institute, NIH
- 2001-2006 Guest Researcher, Laboratory of Pathology, NCI, NIH
- 2001-2018 Executive Officer, American Society for Investigative Pathology
- 2001-2011 Executive Officer, Association for Molecular Pathology
- 2001-2011 Executive Officer, Association of Pathology Chairs
- 2001-2002 Executive Officer, Universities Associated for Research and Education in Pathology
- 2001-2018 Executive Officer, Intersociety Council for Pathology Information
- 2001-2008 Executive Officer, Association for Pathology Informatics
- 2001-2013 Executive Officer, International Society for Biological and Environmental Repositories
- 2006-2009 Executive Officer, Pulmonary Pathology Society
- 2006-2013 Special Volunteer, Laboratory of Pathology, NCI, NIH
- 2011-2018 Executive Officer, Intersociety Pathology Council
- 2015-2017 Secretary, Pathology Roundtable

Current Positions: not remunerated

2011-present Executive Officer Emeritus, Association for Molecular Pathology
2018-present Executive Officer Emeritus, American Society for Investigative Pathology
2018-present Executive Officer Emeritus, Intersociety Council for Pathology Information

Uniformed Service:

1976-1983 - Surgeon, United States Public Health Service
1983-1990 - Senior Surgeon, United States Public Health Service
1990-2001 - Medical Director, United States Public Health Service

Societies:

American Association for Cancer Research
American Association for the Advancement of Science
American Society for Biochemistry and Molecular Biology
American Society for Investigative Pathology
Association for Molecular Pathology

Honors and Awards:

1969 - Phi Beta Kappa, Brandeis University
1969 - John Leslie Award, Brandeis University
1970 - Summa cum laude, Brandeis University
1970 - Michael Bokar Award, Brandeis University
1975 - Basic Sciences Achievement Award, Mount Sinai School of Medicine
1977 - Sigma Xi
1989 - United States Public Health Service (USPHS) Commendation Medal
1991 - Saul J. Horowitz, Jr. Memorial Award, Mount Sinai School of Medicine
1995 - Alpha Omega Alpha, Mount Sinai School of Medicine
2000- Highman Lecturer, University of California at Sacramento
2006- Leadership Award, Association for Molecular Pathology
2013 - Friend of Pathology, Association of Pathology Chairs
2017 Terry Ann Krulwich Physician Scientist Award, Icahn Mount Sinai School of Medicine

Study Sections, Advisory Committees, Editorial Boards and Boards of Directors:

1981-1984 Member, Study Section, Arthritis Foundation
1983-1985 Associate Editor, Journal of Orthopaedic Research
1986-1991 Editorial Board, Calcified Tissue International
1987 Member, Minority Recruitment Networking Task Force, National Cancer Institute
1988 Member, Ad hoc, NIH Pathobiochemistry Study Section
1989 Advisor, Programs Advisory Committee, NIDR
1989-2004 Consultant, Molecular Pathology Committee, College of American Pathologists
1990-1995 Chairman, Education Planning Committee, American Society for Investigative Pathology
1991-1993 Member, Long Range Planning Committee, American Association of Pathologists
1991-1992 Member, Research Grant Review Committee, American Cancer Society

Study Sections, Advisory Committees, Editorial Boards and Boards of Directors (cont'd):

1992-1998	Member, Area Committee on Molecular Methods, National Committee for Clinical Laboratory Standards
1994	Member, Organizing Committee, Molecular Diagnostics Workshop, UAREP
1994-1995	Director, Action Committee for the Association for Molecular Pathology
1994-1995	Organizer, Stowell Symposium, Experimental Biology'95 Annual Meeting
1995-1998	Member, Editorial Board, Current Review of Pathology
1996	Member, ad hoc, NIDR, Oral Cancer Center Study Section
1996-2000	Associate Editor, Diagnostic Molecular Pathology
1966	Member, Advisory Committee on Informed Consent, NHLBI
1996-1999	Member, Ad hoc Pathology Consensus on Stored Tissue Committee, College of American Pathologists
1997-1998	Chair, NIH Intramural Working Group on Studies Using Existing Human Samples or Data
1998-present	Member, Editorial Board, Laboratory Investigation
1999-2001	Member, Ad hoc Committee on Genetics and Medical Information Privacy, College of American Pathologists
1998-2001	Member, Trans-NIH Group on Issues Related to Human Specimen Resources
1998-2001	Member, Trans-NIH Bioethics Committee
1999	Site Visitor, New York State Education Department
2000-2001	NIH Representative, DHHS Working Group on Use of Human Biological Materials
2000-2014	Member, Editorial Board, Diagnostic Molecular Pathology
2000-2003	Member, Committee on Competency, American Board of Pathology
2001-2008	Board of Directors, Association for the Accreditation of Human Research Protection Programs
2002-2004	Member, Association of American Medical Colleges Council of Academic Societies Program Committee
2002	Organizer and Moderator, Symposium on Molecular Surgical Pathology: Studies in Wax, Annual Meeting of the United States and Canadian Academy of Pathology
2003-2004	Organizer and Chair, Symposium on Human Research Protections, Experimental Biology 2003 and 2004
2003-2007	Executive Committee, Association for the Accreditation of Human Research Protection Programs
2005-2015	Senior Executive Advisory Board, Archives of Pathology and Laboratory Medicine
2005	Member, Search Committee, Editor-in-Chief of FASEB Journal
2005-2007	Member, National Library of Medicine Working Group on the NIH Policy for Enhanced Public Access
2006-2007	Advisory Board, Washington G2 Reports Molecular Conference of 2007
2007-2013	Member, PubMed Central National Advisory Committee of the National Library of Medicine
2008-present	Member, FASEB Human Subjects Protections Advisory Committee
2009-2010	Member, NICHD Special Study Section for Biorepository Contracts
2009	Member, NINCDS Special Study Section for Biorepository Contracts
2010-present	Member, Advisory Board, NICHD Brain Trust
2010-present	Member, Scientific Advisory Board, Canadian Prostate Cancer Biomarker Network
2010	Member, Department of Defense Study Section for Lung Cancer Repositories

Study Sections, Advisory Committees, Editorial Boards and Boards of Directors (cont'd):

2012	Member, Department of Defense Study Section for Lung Cancer Research Program
2012	Member, NIDDK Biosample Repository Contracts Review Panel
2013	Member, Bidirectional Research Roundtable Meeting, National Institute for Dental and Craniofacial Research
2013	Chair, NCATS Research Resource for Human Organs and Tissue Special Emphasis Panel
2014	Organizer and Chair, Plenary Session on Systems Biology, American College of Veterinary Pathologists Annual Meeting
2016	Chair, NIH Precision Medicine Initiative Biorepository Study Section
2016 - 2017	Chair, NIDDK Biosample Repository Contracts Review Panel
2017	Chair, The Human Tissue and Organ Research Resource U42 Study Section, NIH Center for Scientific Review
2018	Member, NICHD National Children's Study (NCS) Biological and Environmental Sample Repository Study Section
2018	Chair, NCI Special Emphasis Panel, Collaborative Human Tissue Network (CHTN)

Elected (and Appointed) Offices:

1995-1997	Councilor, American Society for Investigative Pathology
1995-1997	Secretary-Treasurer, Association for Molecular Pathology
1997-1998	Vice President-elect, American Society for Investigative Pathology
1998 -	President-elect, Association for Molecular Pathology
1998-1999	Vice President, American Society for Investigative Pathology
1999	President, Association for Molecular Pathology
1999-2000	President, American Society for Investigative Pathology
2003-2006	Chair (elected), Intersociety Pathology Council
2007-2011	Chair (appointed), Intersociety Pathology Council
2014-2017	Recording Secretary (appointed), Pathology Roundtable

Teaching:

1986	Lecturer, Extracellular Matrix Modulation of Cell Function, Catholic University
1986	Lecturer, Department of Biochemistry, Howard University
1987	Co-director, Concepts in Molecular Biology Course, American Association of Pathologists
1988- 1999	Director, Concepts in Molecular Biology Course, American Society for Investigative Pathology
1991	Organizer, Molecular Pathology Workshop, Annual Meeting of Veterinary Pathologists
1994	Faculty, University of Miami School of Medicine 19th Annual Review and Recent Practical Advances in Pathology
1996	Visiting Professor, Emory University School of Medicine
1997	Visiting Professor, Ball Memorial Hospital, Muncie, Indiana
1998	Visiting Professor, Uniformed Services University of Health Sciences, Veterinary Department
1999 –2000	Visiting Professor, George Washington University Medical School, Pathology Department

Teaching (cont'd):

2002	Course Director, Introduction to Molecular Biology, Annual Meeting of the Society for Nuclear Medicine
2003	Visiting Professor, University of Miami School of Medicine
2004	Guest Lecturer, Medical College of Wisconsin
2005- 2008	Faculty, Current Applications of Molecular Pathology: Diagnosis and Implications for Therapy in Tissue Samples, Madrid, Spain
2005- 2018	Director, ASIP Journal Continuing Medical Education Program
2009	Visiting Professor, Pennsylvania State College of Medicine
2009	Visiting Faculty, International Bioethics Course, Udine, Italy
2015	Visiting Faculty, Curso Teórico-Práctico Intensivo de Biología y Patología Moleculares Para Médicos, Barcelona, Spain
2017	Visiting Faculty, Curso Teórico-Práctico Intensivo de Biología y Patología Moleculares Para Médicos, Barcelona, Spain
2019	Visiting Faculty, Curso Teórico-Práctico Intensivo de Biología y Patología Moleculares Para Médicos, Barcelona, Spain

Invited Keynote Lectures at National/International Meetings:

- 1985 - "Role of laminin receptor in metastasis," Annual Meeting of the Inter-American Society for Chemotherapy, Tampa, Florida
- 1986 - "Biochemical mechanisms of metastasis," Scientific Symposium of the 5th Anniversary of the Harrington Cancer Center, Amarillo, Texas
- 1987 - "Metastasis model systems," International Congress on Cancer Metastasis, Bologna, Italy
- 1988 - "Introduction to molecular biology," VII Congress of the International Pediatric Nephrology Association, Toronto, Canada
- 1990 - "Genes for metastasis," US-Japan Breast Cancer Workshop, Osaka, Japan
- 1990 - "Genes that suppress metastatic potential," 32nd Annual Scientific Meeting of the American Society for Therapeutic Radiology and Oncology, Miami, Florida
- 1991 - "Laminin receptors in metastasis," Basement Membrane Conference, Airlie, VA
- 1992 - "Introduction to molecular biology in pathological anatomy", Danish Society of Pathological Anatomy and Clinical Cytology Annual Meeting, Esbjerg, Denmark
- 1992 - "Development and assessment of potentially new molecular markers in breast cancer metastasis," Pisa Symposium in Oncology, Pisa, Italy
- 1993 - "Molecular inhibitors of cancer invasion and metastasis," Cellular, Molecular and Clinical Aspects of Squamous Cell Carcinomas, Glasgow, Scotland
- 1993 - "Genetic and biochemical mediation of tumor invasion and metastasis," 4th Annual Symposium of the Yonsei Cancer Research Institute, Seoul, Korea
- 1995 - "Differential expression of mRNAs in human cancers," European Congress of Pathology, Copenhagen, Denmark
- 1995 - "Molecular biology for the clinician," Society for Nuclear Medicine, Annual Meeting, Minneapolis, MN
- 1996 - "Perspectives on informed consent for genetic research on stored tissue samples," Association for Molecular Pathology, Annual Meeting, Baltimore, MD
- 1997 - "Molecular biology for the clinician," Society for Nuclear Medicine, Annual Meeting, San Antonio, TX

Invited Keynote Lectures at National/International Meetings (cont'd):

- 1997 - "Ethical issues in clinical and research studies using human samples," Association for Molecular Pathology Annual Meeting, San Diego, CA
- 1998 – "Ethics of genetic testing: role of the clinical laboratory," American Association for Clinical Chemistry Eighth Annual Clinical Chemistry Forum, Crystal City, VA
- 1999 - "Ethical issues in molecular pathology: paradigms in flux," College of American Pathologists Conference XXXIV: Molecular Pathology: Role in Improving Patient Outcome, Bethesda, MD
- 1999 - "Ensuring Patient Privacy and Informed Consent in Histocompatibility Laboratories," American Society for Histocompatibility and Immunogenetics Annual Meeting, New Orleans, LA
- 2000- "Approaches to Developing Molecular Markers for Solid Tumors," University of California at Davis, Davis, CA
- 2001- "Ethics of Genetic Testing in the Clinical Laboratory," Annual Beckman Conference, American Association for Clinical Chemistry, Newport Beach, CA
- 2001- "The Protection of Participants (Human Subjects) in Research: Use of Biological Materials," ASCO/NCI Scientific Symposium on Molecular Oncology for the Clinical Oncologist
- 2002- "Repositories in Clinical and Genetic Research," University of Washington Symposium on Clinical Research
- 2002- "Pharmacogenomics: Ethical and Social Issues," AACC Conference on Pharmacogenomics
- 2002- "Ethical Considerations in Molecular Diagnostics and Therapeutics," IBC Conference on the Interface: Molecular Diagnostics Meets Therapeutics"
- 2002- "The Protection of Participants (Human Subjects) in Research: Use of Biological Materials," ASCO/NCI Scientific Symposium on Molecular Oncology for the Clinical Oncologist
- 2002- "Molecular Medicine in the Information Age: Ethical, Legal and Social Implications for Health Care in the 21st Century," Conferenza Nazionale sulle Biotecnologie e Presentazione dell'MGM, Istituto di Medicina e Genetica Molecolare
- 2003- "SNPs and Chips: The Future of Molecular Pathology in the Information Age," Southeast Association of Pathology Chairs Meeting, Key Biscayne, FL
- 2003- "SNPs and Chips: The Future of Pathology Practice and Research in the Information Age," University of Toronto, Toronto, Canada
- 2004- "The importance of tissue banking and tissue research," Conflicts of Interest, Privacy/Confidentiality, and Tissue Repositories, Boston, MA
- 2004- "The Power of Molecular Biological Techniques," Experimental Biology 2004, Washington, DC
- 2004- "Clinical impact of proteomics in surgical pathology of solid tumors," USCAP Annual Meeting, Vancouver, BC, Canada
- 2004- "Patenting, licensing, and universities: trends and implications," National Academy of Sciences, Washington, DC
- 2005- "Armed Forces Institute of Pathology Repository," Conference on the Future of the AFIP, Washington, DC
- 2005- "Human Biological Materials, HIPA and the Common Rule," National Cancer Institute Biospecimen Workshop June 23, 2005, Bethesda, MD
- 2005- "Technical and ethical approaches to molecular pathology: diagnosis, prognosis and implications for therapy," Madrid, Spain

Invited Keynote Lectures at National/International Meetings (cont'd):

- 2006- "Soft Tissue Sarcomas: Detection of Minimal Disease and Future Diagnostic Approaches," Madrid, Spain
- 2007- "Regulatory Aspects of Tissue Banking," Experimental Biology 2007, Washington DC
- 2007- Panel Discussion on the NIH Enhanced Public Access Policy, April 25, 2008, National Institute of Neurological Disorders and Stroke
- 2007- "NCI Best Practices for Biospecimen Resources," Biospecimen Best Practices Forum, June 18, 2007, National Cancer Institute, Bethesda, MD
- 2007- "Diagnostic and Therapeutic Potential of Small Nucleic Acid Molecules," Madrid, Spain
- 2008- "Utilization of clinical data and archived specimens in the global biobanking era: how to navigate legal, ethical and regulatory issues and implications for international exchanges," Association for Pathology Informatics Companion Meeting, May 21, 2008, Bethesda, MD
- 2008- Group Leader, Genotype-Tissue Expression (GTEx) Resource Workshop I, June 2-3, 2008, National Human Genome Research Institute, Rockville, MD
- 2008- "Molecular pathology for the practicing pathologist," Madrid, Spain
- 2009- "Pharmacogenetics and the management of breast cancer: optimization of tamoxifen therapy," 2009 Mid-Atlantic Bio, Washington DC
- 2009- "Diagnostic and therapeutic potential of small nucleic acid molecules," Pennsylvania State College of Medicine, Hershey, PA
- 2009- "The Ethics of Molecular Genetic Technology," XIII International Intensive Course in Bioethics, Udine, Italy
- 2009- "Conflicts of Interest," XIII International Intensive Course in Bioethics, Udine, Italy
- 2009- "Pharmacogenetics and treatment of colorectal tumors," Madrid, Spain
- 2009- "Journey to success: career pathways in pathology," Italian Pathology Society, Naples, Italy
- 2010- "Pathology in the Genome Era: Challenges to diagnosis, prognosis, therapeutics, and implications for training programs," Temple University, Philadelphia, PA
- 2011- "Pathology in the Genome Era: Challenges to diagnosis, prognosis, therapeutics, and implications for training programs," The Methodist Hospital, Houston TX
- 2012- "Best practices of biobanking and biospecimen collection," ASIP 2012 Annual Meeting, San Diego, CA
- 2012- "Interpreting genomic information for clinical care," American Society for Clinical Pathology 2012 Annual Meeting, Boston, MA
- 2012- "How a hospital biobank supports patient care and research programs," National Cancer Center Hospital, Tokyo, Japan
- 2012- "Best practices for biobanking in the era of precision medicine," Japan Society for Clinical Oncology 2012 Annual Meeting, Yokohama, Japan
- 2012- "Whole genome sequencing and incidental findings in clinical laboratory settings," CEER Investigators Meeting, NHGRI, Rockville, MD
- 2012- "Is the anonymized sample in research an endangered species?" ASIP 2014 Annual Meeting, San Diego, CA
- 2014- "Introduction to Systems Biology," American College of Veterinary Pathologists 2014 Annual Meeting, Atlanta, GA
- 2015- "Small RNAs," VIII Curso Teórico-Práctico Intensivo de Biología y Patología Moleculares Para Médicos, Barcelona, Spain
- 2015- "Disruptive Influences on Academic Pathology Departments," University of Michigan School of Medicine, Ann Arbor, MI
- 2016- "Disruptive Influences on Academic Pathology Research," Association of Pathology Chairs Annual Meeting, San Bernardo, CA

Invited Keynote Lectures at National/International Meetings (cont'd):

- 2016 "Return of Individual Research Results: Complex Considerations for a Not so Simple Request – Concerns from Pathology," PRIM&R – AER 2016 Conference, Anaheim, CA
- 2017 "Introduction to Nucleic Acid Macromolecules," IX Curso Teórico-Práctico Intensivo de Biología y Patología Moleculares Para Médicos, Barcelona, Spain
- 2017 "Cancer Genomics," IX Curso Teórico-Práctico Intensivo de Biología y Patología Moleculares Para Médicos, Barcelona, Spain
- 2017 "Return of Individual Research Results: Ethical Considerations and the Pathology Perspective," PRIM&R – AER 2017 Conference, San Antonio, TX
- 2019 "Cancer Genomics," X Curso Teórico-Práctico Intensivo de Biología y Patología Moleculares Para Médicos, Barcelona, Spain

Patents:

- Sobel et al: Recombinant DNA Clone Encoding Laminin Receptor Patent #4,861,710; granted August 29, 1989
- Steeg et al: Diagnosis of Metastatic Potential of Tumors by the NM23 gene #5,049,662; granted September 17, 1991.

Medical Licenses:

- Maryland D0020038 Expiration 9/30/2021
- New York 184977-1 Expiration 3/31/2021
- DEA BS0899344 Expiration 2/28/2021
- Maryland CDS M26688 Expiration 8/31/2022

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1. Sobel ME, Krulwich TA. Metabolism of D-fructose by *Arthrobacter pyridinolis*. *J Bacteriol*. 1973. 113:907-913.
2. Sobel, ME, Wolfson EB, Krulwich, TA. Abolition of crypticity of *Arthrobacter pyridinolis* toward glucose and α -glucosides by tricarboxylic acid cycle intermediates. *J Bacteriol*. 1973. 116:271-278.
3. Wolfson EB, Sobel ME, Krulwich TA. Phosphoenolpyruvate: fructose phosphotransferase activity in whole cells and membrane vesicles of *Arthrobacter pyridinolis*. *Biochim Biophys Acta*. 1973. 321:181-188.
4. Krulwich TA, Sobel ME, Wolfson EB. Alternate pathways of D-fructose transport and metabolism in *Arthrobacter pyridinolis*. *Biochem Biophys Res Commun*. 1973. 53:258-263.
5. Wolfson EB, Sobel ME, Blanco R, Krulwich TA. Pathways of D-fructose transport in *Arthrobacter pyridinolis*. *Arch Biochem Biophys*. 1974. 160:440-444.
6. Adams SL, Sobel ME, Howard BH, Olden K, Yamada KM, de Crombrughe B, Pastan I. Levels of translatable mRNAs for cell surface protein, collagen precursors, and two membrane proteins are altered in Rous sarcoma virus-transformed chick embryo fibroblasts. *Proc Natl Acad Sci USA*. 1977. 74:3399-3403.
7. Howard BH, Adams SL, Sobel ME, Pastan I, de Crombrughe B: Decreased levels of collagen mRNA in Rous sarcoma virus-transformed chick embryo fibroblasts. *J Biol Chem*. 1978. 253:5869-5874.
8. Sobel ME, Yamamoto T, Adams SL, DiLauro R, Avvedimento VE, de Crombrughe B, Pastan I. Construction of a recombinant bacterial plasmid containing a chick pro- α 2 collagen gene sequence. *Proc Natl Acad Sci USA*. 1978. 75:5846-5850.
9. Pelliccione N, Jaffin B, Sobel ME, Krulwich TA. Induction of the phosphoenolpyruvate: hexose phosphotransferase system associated with relative anaerobiosis in an obligate aerobe. *Eur J Biochem*. 1979. 95:69-75.
10. Yamamoto T, Sobel ME, Adams SL, Avvedimento, VE, DiLauro R, Pastan I, de Crombrughe B, Showalter A, Pesciotta D, Fietzek P, Olsen B. Construction of a recombinant bacterial plasmid containing pro- α 1(I) collagen DNA sequences. *J Biol Chem*. 1980. 255:2612-2615.
11. Gottesman MM, Sobel ME. Tumor promoters and Kirsten sarcoma virus increase synthesis of a secreted glycoprotein by regulating levels of translatable mRNA. *Cell*. 1980. 19:449-455.
12. Cabral F, Sobel ME, Gottesman MM. CHO mutants resistant to colchicine, colcemid or griseofulvin have an altered β -tubulin. *Cell*. 1980. 20:29-36.
13. Fagan JB, Sobel ME, Yamada KM, de Crombrughe B, Pastan I. Effects of transformation on fibronectin gene expression using cloned fibronectin cDNA. *J Biol Chem*. 1981. 256:520-525.
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15. Vogeli G, Ohkubo H, Sobel ME, Yamada Y, Pastan I, de Crombrughe B. Structure of the promoter for the chick alpha 2 collagen gene. *Proc Natl Acad Sci USA* 1981. 78:5334-5338.
 16. Duchene M, Sobel ME, Muller PK. Levels of collagen mRNA in dedifferentiating chondrocytes. *Exp Cell Res*. 1982. 142:317-324.
 17. Sobel ME, Dion DL, Vuust J, Colburn NH. Tumor-producing phorbol esters inhibit procollagen synthesis at a pretranslational level in JB-6 mouse epidermal cells. *Mol Cell Biol*. 1983. 3:1527-1532.
 18. Marsilio E, Sobel ME, Smith BD. Absence of procollagen $\alpha 2(I)$ mRNA in chemically transformed rat liver epithelial cells. *J Biol Chem*. 1984. 259:1401-1404.
 19. Young MF, Vogeli G, Nunez AM, Fernandez MP, Sullivan M, Sobel ME. Isolation of cDNA and genomic DNA clones encoding type II collagen. *Nucl Acids Res*. 1984. 12:4207-4228.
 20. Fernandez MP, Young MF, Sobel ME. Methylation of type II and type I collagen genes in differentiated and dedifferentiated chondrocytes. *J Biol Chem*. 1985. 260:2374-2378.
 21. Doherty PJ, Hua L, Liau G, Gal S, Graham DE, Sobel ME, Gottesman MM. Malignant transformation and tumor promoter treatment increase levels of a transcript for a secreted glycoprotein. *Mol. Cell Biol*. 1985. 5:466-473.
 22. Sangiorgi FO, Benson-Chanda V, de Wet W, Sobel ME, Ramirez F. Analysis of cDNA and genomic clones coding for the pro α 1 chain of calf type II collagen. *Nucl Acids Res*. 1985. 13:2815-2826.
 23. Sangiorgi FO, Benson-Chanda V, de Wet WJ, Sobel ME, Tsipouras P, Ramirez F. Isolation and partial characterization of entire human pro $\alpha 1$ (II) collagen gene. *Nucl Acids Res*. 1985. 13:2207-2225.
 24. Vuust J, Sobel ME, Martin GR. Regulation of type I collagen synthesis: Total pro $\alpha 1(I)$ and pro $\alpha 2(I)$ mRNAs are maintained in a 2:1 ratio under varying rates of collagen synthesis. *Eur J Biochem*. 1985. 151:449-453.
 25. Ramirez F, Bernard M, Chu ML, Dickson L, Sangiorgi F, Weil D, de Wet W, Junien C, Sobel ME. Isolation and characterization of the human fibrillar collagen genes. *Ann N.Y. Acad Sci*. 1985. 460:117-129.
 26. Huerre-Jeanpierre C, Mattei MG, Weil D, Grzeschik KH, Chu ML, Sangiorgi FO, Sobel ME, Ramirez F, Junien C. Further evidence for the dispersion of the human fibrillar collagen genes. *Am J Human Genet*. 1986. 38:26-37.
 27. Nath P, Laurent M, Horn E, Sobel ME, Zon G, Vogeli G. Isolation of an alpha-1 type IV collagen cDNA clone using a synthetic oligodeoxynucleotide. *Gene*. 1986. 43:301-304.
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30. Laurent M, Martin GR, Sobel ME. Cell-free translation products of basement membrane RNA from the EHS tumor. *Biochim Biophys Acta*. 1987. 908:241-250.
31. Young MF, Shimokawa HS, Sobel ME, Termine JD. A characterization of amelogenin messenger RNA in the bovine tooth germ. *Adv Dent Res*. 1987. 1:289-292.
32. Shimokawa H, Ogata Y, Sasaki S, Sobel ME, McQuillan CI, Termine JD, Young, MF. Molecular cloning of bovine amelogenin cDNA. *Adv Dent Res*. 1987. 1:293-297.
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34. Liotta LA, Wewer U, Rao CN, Schiffmann E, Stracke M, Guirguis R, Thorgeirsson U, Muschel R, Sobel ME. Biochemical mechanisms of tumor invasion and metastasis. *Anticancer Drug Design*. 1987. 2:195-202.
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36. Steeg PS, Bevilacqua G, Kopper L, Thorgeirsson UP, Talmadge JE, Liotta LA, Sobel ME. Evidence for a novel gene associated with low tumor metastatic potential. *J Natl Cancer Inst*. 1988. 80:200-203.
37. Liotta LA, Wewer U, Rao CN, Schiffmann E, Stracke M, Guirguis R, Thorgeirsson U, Muschel R, Sobel ME. Biochemical mechanisms of tumor invasion and metastasis. *Adv Exp Med Biol*. 1988. 233:161-169.
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40. Steeg PS, Bevilacqua G, Sobel ME, Liotta LA. Identification and characterization of differentially expressed genes in tumor metastasis: The *nm23* gene. In Sudilovsky, O., Pitot, H. C., and Liotta, L. A. (Eds.): *Boundaries between Promotion and Progression during Carcinogenesis. Basic Life Sciences, New York, Plenum Press*. 1991. 57:355-361.
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 45. Sobel ME. Metastasis suppressor genes. *J Natl Cancer Inst.* 1990. 82:267-276.
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