

curriculum vitae

Name Sonia Franco, M.D., Ph.D.

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DEMOGRAPHIC AND PERSONAL INFORMATION

Current appointments Assistant Professor
Department of Radiation Oncology,
Department of Oncology
The Sidney Kimmel Cancer Center
Johns Hopkins University
Baltimore MD

Personal data

Date of birth: February 1st, 1969
Place of birth: Toral de los Vados, Leon, Spain
Citizenship: Spain, Permanent US Resident
Marital status: Single

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Education and training

1987-1993 MD, Autonoma University School of Medicine, Madrid, Spain

1993-1994 Intern in Pediatrics, University of Chicago Children's Hospital, Chicago IL

1994-1996 Resident in Pediatrics, University of Chicago Children's Hospital, Chicago IL

1996-1999 Fellow in Pediatric Hematology and Oncology, Memorial Sloan-Kettering Cancer Center-Cornell University, New York NY

2000-2004 PhD, Molecular and Cellular Biology Program, Autonoma University, Madrid, Spain

2004-2008 Postdoctoral Research Fellow, Harvard Medical School and the Center for Blood Research Institute, Boston MA

Professional Experience

- 1993-1994 Intern in Pediatrics, University of Chicago Children's Hospital, Chicago IL
- 1994-1996 Resident in Pediatrics, University of Chicago Children's Hospital, Chicago IL
- 1996-2000 Fellow in Pediatric Hematology and Oncology, Memorial Sloan-Kettering Cancer Center-Cornell University, New York NY
- 2004-2008 Postdoctoral Research Fellow, Harvard Medical School and the Center for Blood Research Institute, Boston MA
- 2008- Assistant Professor, Department of Radiation Oncology and Department of Oncology, Sidney Kimmel Cancer Center, Johns Hopkins University

RESEARCH ACTIVITIES

Publications

Peer-reviewed original research articles

1. **Franco S**, Kelly M, Ushay M, DiMichele D. Highly probable anaphylactic reaction to systemic thrombolytic therapy with high-dose urokinase in a child with a prosthetic valve. *J. Pediatr. Hematol. Oncol.* 20(2):181-2, 1998.
2. Albanell J, Bosl GJ, Reuter VE, Engelhardt M, **Franco S**, Moore MAS, Dmitrovsky E. Telomerase activity in germ cell cancers and mature teratomas. *J. Natl. Cancer Inst.* 91(15):1321-1326, 1999.
3. MacKenzie KL, **Franco S**, May C, Sadelain M, Moore MAS. Mass cultured human fibroblasts overexpressing hTERT encounter a growth crisis following an extended period of proliferation. *Exp. Cell Res.* 259(2):336-350, 2000.
4. **Franco S**, MacKenzie KL, Dias S, Alvarez S, Rafii S, Moore MAS. Clonal variation in phenotype and lifespan of human embryonic fibroblasts (MRC-5) transduced with the catalytic component of telomerase (hTERT). *Exp. Cell Res.* 268(1):14-25, 2001.
5. **Franco S**, Segura I, Riese H, Blasco MA. Decreased B16F10 melanoma growth and impaired vascularization in telomerase-deficient mice with critically short telomeres. *Cancer Res.* 62(2):552-9, 2002.
6. Espejel S, **Franco S**, Rodríguez-Perales S, Cigudosa JC, Blasco MA. Mammalian Ku86 mediates chromosomal fusions and apoptosis caused by critically short telomeres. *EMBO J.* 21(9):2207-2219, 2002.
7. **Franco S**, Alsheimer M, Herrera E, Benavente, R. Blasco MA. Mammalian meiotic telomeres: composition and ultrastructure in telomerase deficient mice. *European J. Cell Biol.* 81:1-6, 2002.

8. MacKenzie KL, **Franco S**, Naiyer AJ, May C, Sadelain M, Rafii S, Moore MAS. Multiple stages of malignant transformation of human endothelial cells modelled by co-expression of telomerase reverse transcriptase, SV-40 large T antigen and oncogenic N-ras. *Oncogene* 21(27):4200-4211, 2002.
9. Wiemann SU, Satyanarayana A, Tsahuridu M, Tillmann H, Zender L, Klempnauer J, Flemming P, **Franco S**, Blasco MA, Manns MP, Rudolph KL. Hepatocyte telomere shortening and senescence are general markers of human liver cirrhosis. *FASEB J.* 16(9):935-942, 2002.
10. Espejel S*, **Franco S***, Sgura A*, Eguia R, Blasco MA. DNA-PKcs functionally interacts with telomerase in maintaining telomere length in the mouse. *EMBO J.* 21(22):6275-6287, 2002.
11. Leri A*, **Franco S***, Zacheo A, Barlucchi L, Chimenti S, Limana F, Nadal-Ginard B, Kajstura J, Anversa P, Blasco MA. Ablation of telomerase and telomere loss leads to cardiac dilatation and heart failure. *EMBO J.* 22(1):131-139, 2003.
12. **Franco S**, Ozkaynak MF, Sandoval C, Tugal O, Jayabose S, Engelhardt, Moore MAS. Telomere dynamics in childhood leukemia and solid tumors: a follow-up study. *Leukemia* 17(2):401-410, 2003.
13. Maraval A, **Franco S**, Vialas C, Pratviel G, Blasco MA, Meunier B. Porphyrin-aminopyridine conjugates as telomerase inhibitors. *Org. Biomol. Chem.* 1(6): 921 - 927, 2003.
14. Keefe DL, **Franco S**, Liu L, Trimarchi J, Blasco M, Weitzen S. Short telomeres in the chromosomes of spare eggs predict poor prognosis following in vitro fertilization/embryo transfer-towards a telomere theory of reproductive aging in women. *Fertil. Steril.* 80(S3):1, 2003.
15. Poch, E., Carbonell P, **Franco S**, Díez-Juan A, Blasco MA, Andres V. Short telomeres protect from diet-induced atherosclerosis in apolipoprotein E-null mice. *FASEB J.* 18(2):418-420, 2004.
16. Villa A, Navarro-Galve B, Bueno C, **Franco S**, Blasco MA, Martinez-Serrano A. Long-term molecular and cellular stability of human neural stem cell lines. *Exp. Cell Res.* 294: 559-570, 2004.
17. Liu L, **Franco S**, Spyropoulos B, Moens PB, Blasco MA, Keefe DL. Irregular telomeres impair meiotic synapsis and recombination in mice. *Proc. Natl. Acad. Sci. USA* 101:6496-6501, 2004.
18. Ferron S*, Mira H*, **Franco S***, Cano-Jaimez M, Bellmunt E, Ramirez C, Farinas I, Blasco MA. Telomere shortening and chromosomal instability abrogates proliferation of adult but not embryonic neural stem cells. *Development.* 131:4059-4070, 2004.
19. **Franco S**, van de Vrugt HJ, Fernandez P, Aracil M, Arwert F, Blasco MA. Telomere dynamics in fangc-deficient mouse and human cells. *Blood.* 104:3927-3935, 2004.

20. Keefe D, **Franco S**, Liu L, Trimarchi J, Cao B, Weitzen S, Agarwal S, Blasco MA. Telomere length predicts embryo fragmentation after in vitro fertilization in women—Toward a telomere theory of reproductive aging in women. *Am J Obst Gynecol.* 192:1256-1260, 2005.
21. **Franco S**, Canela A, Klatt P, Blasco MA. Effectors of mammalian telomere dysfunction: a comparative transcriptome analysis using mouse models. *Carcinogenesis* 26:1613-1626, 2005.
22. Chua KF, Mostoslavsky R, Lombard DL, Pang WW, Saito S, **Franco S**, Kaushal D, Cheng H-L, Fischer MR, Stokes N, Murphy MM, Appella E, Alt FW. Mammalian SIRT1 limits replicative lifespan in response to chronic genotoxic stress. *Cell Metabol.* 2:67-76, 2005.
23. Franco S, Blasco MA, Siedlak SL, Harris PL, Moreira PI, Perry G, Smith MA. Telomeres and telomerase in Alzheimer's disease: epiphenomena or a new focus for therapeutic strategy? *Alzheimers Dement.* 2:164, 2006.
24. Lou Z, Minter-Dykhouse K, **Franco S**, Gostissa M, Rivera MA, Celeste A, Manis J, van Deursen J, Nussenzweig A, Paull TT, Alt FW, Chen J. MDC1 maintains genomic stability by participating in the amplification of ATM-dependent DNA damage signals. *Mol. Cell.* 21:187-200, 2006.
25. **Franco S**, Gostissa M, Zha S, Lombard DB, Murphy MM, Zarrin A, Yan C, Tepsuporn S, Morales JC, Adams MM, Lou Z, Bassing CH, Manis JP, Chen J, Carpenter PB, Alt FW. Histone H2AX prevents DNA breaks from progressing to chromosome breaks and translocations. *Mol. Cell.* 21:200-214, 2006.
26. Mostoslavsky R, Chua K, Lombard D, Pang W, Fischer M, Gellon L, Liu P, Mostoslavsky G, **Franco S**, Murphy M, Mills K, Patel P, Hsu JT, Hong AL, Ford E, Cheng H-L, Kennedy C, Nunuez N, Bronson R, Frendewey D, Auerbach W, Valenzuela D, Karow M, Hursting S, Barret JC, Guarente L, Mulligan R, Demple B, Yancopoulos G, Alt FW. Genomic instability and aging-like phenotype in the absence of mammalian SIRT6. *Cell.* 124:315-329, 2006.
27. Morales J, **Franco S**, Murphy MM, Bassing CH, Mills KD, Adams MM, Manis JP, Rassidakis GZ, Alt FW, Carpenter PB. 53BP1 and p53 synergize to suppress genomic instability and lymphomagenesis. *Proc. Natl. Acad. Sci. USA.* 103:3310-3315, 2006.
28. **Franco S**, Blasco MA, Siedlak SL, Harris PL, Moreira PI, Perry G, Smith MA. Telomeres and telomerase in Alzheimer's disease: epiphenomena or a new focus for therapeutic strategy? *Alzheimers Dement.* 2:164-8, 2006.
29. Yan CT, Boboila C, Souza EK, **Franco S**, Hickernell T, Murphy M, Gumaste S, Geyer M, Zarrin AA, Manis JP, Rajewsky K, Alt FW. IgH class switching and translocations employ a robust non-classical end-joining pathway. *Nature* 449:478-82, 2007.
30. Jabara H, Chaudhuri J, Dutt S, Dedeoglu F, Weng Y, Murphy MM, **Franco S**, Alt FW, Manis J, Geha RS. B cell receptor crosslinking delays activation-induced cytidine deaminase induction and inhibits class switch recombination to IgE. *J Clin All Immunol* 121:191-196, 2008.

31. **Franco S**, Murphy MM, Li G, Borjeson T, Boboila C, Alt FW. DNA-PKcs and Artemis are required for the end-joining phase of immunoglobulin class switch recombination. *J. Exp. Med.* 205:557-564, 2008.
32. Takizawa M, Tolarova H, Li Z, Dubois W, Lim S, Callen E, **Franco S**, Mosaico M, Feigenbaum L, Alt FW, Nussenzweig A, Potter M, Casellas R. AID expression levels determine the extent of cMyc oncogenic translocations and the incidence of B cell tumor development. *J. Exp. Med.* 205:1949-57, 2008.
33. Li G, Alt FW, Cheng H-L, Brush JW, Goff PH, Murphy MM, **Franco S**, Zhang Y, Zha S. Lymphocyte –specific compensation for XLF/Cernunnos end-joining functions in V(D)J recombination. *Mol. Cell.* 205:1949-57, 2008.
34. Schenten D*, Kracker S*, Esposito G*, **Franco S**, Klein U, Murphy MM, Alt FW, Rajewsky K. Pol zeta ablation in B cells impairs the germinal center reaction, class switch recombination, DNA break repair and genomic stability. *J. Exp. Med.* 206:477-490, 2009.
35. Orsburn B, Escudero B, Prakash M, Gesheva S, Liu G, Huso DL, **Franco S**. Differential requirement for H2AX and 53BP1 in organismal development and genome maintenance in the absence of PARP1. *Mol. Cell. Biol.* 30(10): 2341-52, 2010.

Review Articles

1. **Franco S**, Blasco MA. Tagging chromosome ends: designer drugs for telomeres. In *The ELSO Gazette: e-magazine of the European Life Scientist Organization* (http://www.the-elso-gazette/magazines/issue7/mreviews/mreviews1_pr.asp), Issue 7 (1 September, 2001).
2. Lombard DB, Chua KF, Mostoslavsky R, **Franco S**, Gostissa M, Alt FW. DNA repair, genome stability, and aging. *Cell.* 120:497-512, 2005.
3. **Franco S**, Alt FW, Manis JP. Pathways that suppress programmed DNA breaks from progressing to chromosomal breaks and translocations. *DNA Repair* 5:1030-1041, 2006.
4. Chaudhuri J, Basu U, Zarrin A, Yan C, **Franco S**, Perlot T, Vuong B, Wang J, Phan RT, Datta A, Manis JP, Alt FW. Evolution of the immunoglobulin heavy chain class switch recombination mechanism. *Advances in Immunology.* 94:157-214, 2007.

EDUCATIONAL ACTIVITIES

Teaching

- 06/08 “Cellular responses to DNA damage: towards targeted cancer therapy”, educational session on Radiobiology to Clinical Fellows in Pediatric Hematology-Oncology, JHU

- 09/08 "DNA damage response and the cellular response to DNA double-strand breaks", Radiobiology Course for Residents in Radiation Oncology, JHU
- 12/09-1/10 "Pathways that repair DNA Double-strand breaks in response to ionizing radiation", Radiobiology Course for Residents in Radiation Oncology, JHU.
- 3/10-5/10 "Genomic instability in Human Disease" course for the Cellular and Molecular Medicine (CMM) Graduate Program (ME:810.716), JHU.

Mentoring

Advisees

- | | | |
|------|----------------|---|
| 2009 | Rupen Garg | JHU Undergraduate Student, Summer Rotation |
| 2009 | Silvia Gesheva | Medical Student, Howard University, Summer Rotation |

Supervision of Pre-Doctoral Work

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|-----------|------------------|---|
| 2006 | Cristian Boboila | Student, Harvard Graduate Program in Immunology |
| 2006-2007 | Michael M Murphy | Master Thesis, Boston University |
| 2009 | Beatriz Escudero | Graduate Student, CNIC, Madrid, Spain |

Thesis Committees

- | | | |
|-------|-----------------|---|
| 2004 | Elsa Callen | Univ. of Barcelona, Spain, Dissertation Committee |
| 2008- | Taylor Reynolds | JHU Pathobiology Program, Thesis Committee |

CLINICAL ACTIVITIES

Certification

- 1997, 2007 Board Certification, Pediatrics
- 2009 Board Certification, Pediatric Hematology and Oncology

ORGANIZATIONAL ACTIVITIES

Editorial Activities

- 2008- *Ad hoc* reviewer, Journal of Oncology

Review Groups/Study Sections

- 2009- Scientific Reviewer, Department of Defense Congressionally Directed Medical Research Programs, Breast Cancer
- 2009 Scientific Reviewer, Department of Defense Peer Reviewed Medical Research Program, Mesothelioma Panel

Professional Societies

- 2007 Fellow, American Academy of Pediatrics (AAP)

- 2008 Member, American Society of Pediatric Hematology-Oncology (ASPHO)
- 2009 Active Member, American Society of Hematology (ASH)
- 2010 Member, American Society for Microbiology (ASM)

Conference Organizer

- 2009 Symposium on "DNA Damage control-from cancer to therapeutics", Dpt. of Radiation Oncology, JHU

Other Professional Activities

- 2010 Question Writer for the Pediatric Hematology and Oncology Examination, American Board of Pediatrics, on the topic "Immunodeficiency".

RECOGNITION

Awards, Honors

- 1998-1999 Fellow of the Laura Rosenberg Foundation, New York
- 2001-2004 Fellow of the Spanish Ministry of Education and Science
- 2004-2006 Fellow of the European Molecular Biology Organization (EMBO)
- 2005 Juan Abello Pascual II National Award to Doctoral Thesis, Real Academia de Doctores, Madrid, Spain
- 2006-2007 Ruth L. Kirschstein National Research Service Award (NRSA), NIH

Invited talks

- 1999 Expression of telomerase after retroviral transduction increases lifespan of primary human fibroblasts. American Society for Research in Pediatrics (SPR), San Francisco, US.
- 2003 Telomerase and Ku86 act together at the telomeres of germ cells: a comparative transcriptome analysis of unmodified mouse cells. Workshop on "Telomeres and telomerase: therapeutical targets for cancer and aging", Instituto Juan March de Estudios e Investigaciones, Madrid, Spain.
- 2005 The role of DNA DSB response in suppression of translocations and cancer. XIII Workshop on "Advances in Molecular Biology", Madrid, Spain.
- 2006 Class switch recombination: a model for the study of double strand break repair. Meeting on "DNA replication and genome integrity", Salk Institute/Caltech.
- 2007 Boston University, Hematology/Oncology Grand Rounds; "Pathways that prevent chromosomal breaks and translocations: class switch recombination as a model"; invited by Dr. Isabel Dominguez.

- 2009 National Institute of Aging, National Institutes of Health, Baltimore, MD. "Genetic Interactions Between PARP1 and the ATM Pathway", invited by Dr. Michael Seidman, August 13th 2009.
- 2009 Department of Chemical Therapeutics, Johns Hopkins University. "Pathway Crosstalk at Mammalian Chromatin: Genetic Interactions between PARP1 and the ATM Network", invited by Dr. Sushant Kachhap, October 5th 2009.
- 2010 Baltimore Area Repair Symposium (BARS). "Differential requirement for histone H2AX and 53BP1 in organismal development and genome maintenance in the absence of PARP1", invited by Drs. Robert Brosh and Alex Drohat, March 18th 2010.
- 2010 Gordon Research Conference on "Biology of Aging: Determinants of Health-Span: From Cells to Humans", abstract selected for oral presentation by Conference Chairs: Drs. Ana Maria Cuervo, Rafa de Cabo and Piddler Jansen-Duerr, Les Diablerets, Switzerland, August 23rd 2010.