Andrea Ventura, MD/PhD

Associate Member
Cancer Biology and Genetics Program
Memorial Sloan Kettering Cancer Center
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Education

1991-1997 **Medical Degree.**
Catholic University Medical School, Rome, Italy.
M.D. awarded on July 1997 with distinction *summa cum laude*.
Thesis: Cloning and characterization of alternative isoforms of the *Mlh1* and *Msh2* genes.

1995 **Visiting Student**
University of California, San Diego, USA
Laboratory of Prof. Richard Boland

1998 **Internship and Medical Board Certification**

1999-2003 **PhD in molecular and cellular biology**
Open University, London, UK.
European Institute of Oncology, Milan, Italy
Supervisor: Prof. Pier Giuseppe Pelicci
External supervisor: Dr. Doreen Cantrell
Thesis: Regulation of Shc expression and localization.

Positions and Employment

2014-present **Associate Member**
Memorial Sloan Kettering Cancer Center
Dept. of Cancer Biology and Genetics

2008-2014 **Assistant Member**
Memorial Sloan Kettering Cancer Center
Dept. of Cancer Biology and Genetics

2003- 2008 **Postdoctoral training**
MIT Center for Cancer Research, Cambridge, MA
Laboratory of Prof. Tyler Jacks

1998-1999 **Part-time research work.**
Istituto Mario Negri Sud, Chieti, Italy
Laboratory of Dr. Arturo Sala.

Awards and Honors

2009 Sidney Kimmel Scholar Award

2008-2013 Geoffrey Beene Junior Investigator Chair

2007 Forbeck Scholar Award

2004-5	Postdoctoral Fellowship American Italian Cancer Research Foundation
2000-2	Research fellowship from Italian Association for Cancer Research

Teaching Experience

2010-present	Cancer Genetic Lecture for the Molecular Genetics Course at WCMS
2013	GSK Core Course: Methods of experimental perturbation of gene expression and function in culture.
2005	Undergraduate course on RNAi at the Massachusetts Institute of Technology

Presentations (limited to the period 2010-2015)

2015 **Fred Hutchinson Cancer Center (invited speaker)**
AACR annual meeting (Philadelhia; invited speaker)
NKI Symposium on non-coding RNAs (Amsterdam; invited Speaker)
Mount Sinai (New York) Invited Speaker.

2014 **International Conference "Non-coding RNA – from Basic Mechanisms to Cancer". Heidelberg, Germany. Invited Speaker.**
ASRI Conference. New York. Invited Speaker.
International Meeting for the German Society for Cell Biology (DGZ). Regensburg, Germany. Invited Speaker.
Harvard University. Boston, MA. Seminar
MMHCC January 2014 Steering Committee Meeting. Rockville, MD. Invited Speaker.

2013 **International Annual Meeting of Cochin Institute. Paris, France. Invited Speaker.**
STARR Symposium. CSHL. Platform presentation.
Genentech, San Francisco. Invited Speaker.
BRIC Institute. Copenhagen, Denmark. Invited Speaker.
Italian Institute of Technology. Milan. Italy. Invited Speaker.
AEGH Annual Meeting. Madrid, Spain. Invited Speaker.
AACR Annual Meeting. Washington. Invited Speaker.
Keystone Symposium "non-coding RNAs and cancer". Vancouver, Canada. Invited Speaker.

2012 **Annual Meeting of the American Society of Human Genetics. San Francisco. Invited Speaker.**
Rutgers University. Seminar.
New York University Medical School. Seminar.
Albert Einstein University. Seminar.
UNJMS Seminar speaker.

2011 **Dana Farber Cancer Institute, Seminars in Oncology. Invited speaker.**
OTS meeting, Copenhagen, Denmark. Invited Speaker.
Leuven University. Belgium. Invited Speaker.
Life Science Symposium. Lausanne, Switzerland. Invited Speaker.
XXI Nikolas Symposium. Greece. Invited Speaker.
2nd mid-Atlantic MicroRNA Mini-Symposium. Philadelphia. Invited speaker.
Keystone Symposium on non-coding RNAs and Cancer, Banff, Canada. Invited Speaker.
Mount Sinai Medical School. Invited Speaker.

2010 **Yonsei University, Seoul, South Korea. Invited Speaker.**
Forbeck Scholar Retreat. Speaker.
Carnegie Institution. Invited seminar speaker.
NRCI, Liverpool Cancer Meeting. Invited Speaker.
MicroRNAs and Cancer Symposium, Seoul, South Korea. Invited Speaker.

CSHL Mechanism and Models of Cancer. Invited Speaker.
American Association for Cancer Research Meeting. Washington DC. Invited Speaker.
University of North Carolina. Non-coding RNAs Symposium. Invited Speaker.
MicroRNAs and human diseases. Saint Kitts. Invited Speaker.
University College of London. microRNAs and Cancer. Invited Speaker.

Other Experiences and Professional Memberships

2013 NIH/NIEHS ES12-006 (R21) and ES12-007(R01). Study Section Member.
2011 American Cancer Society. Grants and fellowship reviewer.
2010 NCI/NIH Molecular Oncology PO1 Study Section. Ad hoc member.
2009 NCI/NIH Molecular Oncology PO1 Study Section. Ad hoc member.

Publications (Published and in press)

Original research

1. Joana A. Vidigal and ANDREA VENTURA. Rapid and efficient one-step generation of paired gRNA CRISPR/*Cas9* libraries. *Nature Communications*. 2014 Aug 17;6:8083. doi: 10.1038/ncomms9083. PubMed PMID: 26278926.

2. Yoon-Chi Han*, Joana A. Vidigal*, Ping Mu*, Evelyn Yao, Irtisha Singh, Alvaro Gonzalez, Carla P. Concepcion, Ciro Bonetti, Paul Ogrodowski, Brett Carver, Licia Selleri, Christina Leslie, Doron Betel, and ANDREA VENTURA. An allelic series of miR-17~92 mutant mice uncovers functional specialization and cooperation among members of a miRNA polycistron. *Nature Genetics*, 2015 Jun 1. doi: 10.1038/ng.3321. [Epub ahead of print] PubMed PMID: 26029871. *Equal contibution.

3. Fiori E, Babicola L, Andolina D, Coassin A, Pascucci T, Patella L, Han YC, VENTURA A, Ventura R. Neurobehavioral Alterations in a Genetic Murine Model of Feingold Syndrome 2. *Behav Genet*. 2015 May 31. [Epub ahead of print] PubMed PMID: 26026879.

4. La Rocca G, Olejniczak SH, González AJ, Briskin D, Vidigal JA, Spraggon L, DeMatteo RG, Radler MR, Lindsten T, Ventura A, Tuschl T, Leslie CS, Thompson CB. In vivo, Argonaute-bound microRNAs exist predominantly in a reservoir of low molecular weight complexes not associated with mRNA. *Proc Natl Acad Sci U S A*. 2015 Jan 7. pii: 201424217. [Epub ahead of print] PubMed PMID: 25568082.

5. Danilo Maddalo, Eusebio Manchado, Carla P. Concepcion, Ciro Bonetti, Joana A. Vidigal, Yoon-Chi Han, Paul Ogrodowski, Alessandra Crippa, Natasha Rekhtman, Elisa de Stanchina, Scott W. Lowe, and ANDREA VENTURA. *In vivo* engineering of oncogenic chromosomal rearrangements with the CRISPR/Cas9 system. *Nature* (2014) NIHMS: NIHMS632589 PMID: PMID: 25337876

6. Frederique Zindy, Daisuke Kawauchi, Youngsoo Lee, Olivier Ayrault, Leila Ben Merzoug, Peter J. McKinnon, ANDREA VENTURA and Martine F. Roussel. Role of the miR-17 approximately 92 cluster family in cerebellar and medulloblastoma development. *Biol Open* 3, 597-605 (2014). PMCID: PMC4154296

7. Carla P. Concepcion, Yoon-Chi Han, Ping Mu, Ciro Bonetti, Evelyn Yao, Aleco D'Andrea, Joana A. Vidigal, William P. Maughan, Paul Ogrodowski and ANDREA VENTURA . Intact p53-dependent responses in miR-34-deficient mice. *PLoS Genet.* 8, e1002797 (2012). PMCID: PMC3406012.

8. Jr-Shiuan Yang, Michael D. Phillips, Doron Betel, Ping Mu, ANDREA VENTURA , Adam C. Siepel, Kevin C. Chen and Eric C. Lai. Widespread regulatory activity of vertebrate microRNA* species. *RNA* 17, 312-326 (2011). PMCID: PMC3022280

9. Ashish Lal, Marshall P. Thomas, Gabriel Altschuler, Francisco Navarro, Elizabeth O'Day, Xiao Ling Li, Carla Concepcion, Yoon-Chi Han, Jerome Thiery, Danielle K. Rajani, Aaron Deutsch, Oliver Hofmann, ANDREA VENTURA , Winston Hide and Judy Lieberman. Capture of microRNA-bound mRNAs identifies the tumor suppressor miR-34a as a regulator of growth factor signaling. *PLoS Genet.* 7, e1002363 (2011). PMCID: PMC3213160.

10. Loïc de Pontual[&], Evelyn Yao[&], Patrick Callier, Laurence Faivre, Valérie Drouin, Sandra Cariou, Arie Van Haeringen, David Geneviève, Alice Goldenberg, Myriam Oufadem, Sylvie Manouvrier, Arnold Munnich, Joana Alves Vidigal, Michel Vekemans, Stanislas Lyonnet, Alexandra Henrion-Caude, ANDREA VENTURA* and Jeanne Amiel*. Germline deletion of the miR-17 approximately 92 cluster causes skeletal and growth defects in humans. *Nat. Genet.* 43, 1026-1030 (2011). *corresponding authors. [&] Equal contribution. PMCID: PMC3184212

11. Massimiliano Agostini, Paola Tucci, Joern R. Steinert, Ruby Shalom-Feuerstein, Matthieu Rouleau, Daniel Aberdam, Ian D. Forsythe, Kenneth W. Young, ANDREA VENTURA , Carla P. Concepcion, Yoon-Chi Han, Eleonora Candi, Richard A. Knight, Tak W. Mak and Gerry Melino. microRNA-34a regulates neurite outgrowth, spinal morphology, and function. *Proc. Natl. Acad. Sci. U.S.A.* 108, 21099-21104 (2011). PMCID: PMC3248521

12. Ping Mu*, Yoon-Chi Han*, Doron Betel, Evelyn Yao, Massimo Squatrito, Paul Ogrodowski, Elisa de Stanchina, Aleco D'Andrea, Chris Sander and ANDREA VENTURA . Genetic dissection of the miR-17~92 cluster of microRNAs in Myc-induced B-cell lymphomas. *Genes Dev.* 23, 2806-2811 (2009). PMCID: PMC2800095. *Equal contibution.

13. ANDREA VENTURA, Amanda G. Young, Monte M. Winslow, Laura Lintault, Alex Meissner, Stefan J. Erkeland, Jamie Newman, Roderick T. Bronson, Denise Crowley, James R. Stone, Rudolf Jaenisch, Phillip A. Sharp and Tyler Jacks. Targeted deletion reveals essential and overlapping functions of the miR-17 through 92 family of miRNA clusters. *Cell* 132, 875-886 (2008). PMCID: PMC2323338.

14. ANDREA VENTURA*, David G. Kirsch*, Margaret E. McLaughlin, David A. Tuveson, Jan Grimm, Laura Lintault, Jamie Newman, Elizabeth E. Reczek, Ralph Weissleder and Tyler Jacks. Restoration of p53 function leads to tumour regression in vivo. *Nature* 445, 661-665 (2007). *equal contribution. PubMed PMID: 17251932 *Equal contibution.

15. Alfredo Pezzicoli, Cristina Ulivieri, Nagaja Capitani, ANDREA VENTURA, Piergiuseppe Pelicci and Cosima T. Baldari. Expression in T-cells of the proapoptotic protein p66SHC is controlled by promoter demethylation. *Biochem. Biophys. Res. Commun.* 349, 322-328 (2006). PubMed PMID: 16934220

16. ANDREA VENTURA*, Alexander Meissner*, Christopher P. Dillon, Michael McManus, Phillip A. Sharp, Luk Van Parijs, Rudolf Jaenisch and Tyler Jacks. Cre-lox-regulated conditional RNA interference from transgenes. *Proc. Natl. Acad. Sci. U.S.A.* 101, 10380-10385 (2004). *equal contribution PMCID: PMC478580. *Equal contibution.

17. ANDREA VENTURA, Marco Maccarana, Veronica A. Raker and Pier Giuseppe Pelicci. A cryptic targeting signal induces isoform-specific localization of p46Shc to mitochondria. *J. Biol. Chem.* 279, 2299-2306 (2004).

18. Sonia Pacini, Michela Pellegrini, Enrica Migliaccio, Laura Patrussi, Cristina Ulivieri, ANDREA VENTURA, Fabio Carraro, Antonella Naldini, Luisa Lanfrancone, Piergiuseppe Pelicci and Cosima T. Baldari. p66SHC promotes apoptosis and antagonizes mitogenic signaling in T cells. *Mol. Cell. Biol.* 24, 1747-1757 (2004). PMCID: PMC344195

19. M. Mandala, G. Curigliano, P. Bucciarelli, G. Ferretti, P. M. Mannucci, M. Colleoni, A. VENTURA(3), G. Peruzzotti, G. Severi, P. G. Pelicci, R. Biffi, F. Orsi, S. Cinieri and A. Goldhirsch. Factor V Leiden and G20210A prothrombin mutation and the risk of subclavian vein thrombosis in patients with breast cancer and a central venous catheter. *Ann Oncol* 15, 590-593 (2004).
20. ANDREA VENTURA, Lucilla Luzi, Sonia Pacini, Cosima T. Baldari and Pier Giuseppe Pelicci. The p66Shc longevity gene is silenced through epigenetic modifications of an alternative promoter. *J. Biol. Chem.* 277, 22370-22376 (2002).
21. Mirella Trinei, Marco Giorgio, Angelo Cicalese, Sara Barozzi, ANDREA VENTURA, Enrica Migliaccio, Elisabetta Milia, Ines Martin Padura, Veronica A. Raker, Marco Maccarana, Valeria Petronilli, Saverio Minucci, Paolo Bernardi, Luisa Lanfrancone and Pier Giuseppe Pelicci. A p53-p66Shc signalling pathway controls intracellular redox status, levels of oxidation-damaged DNA and oxidative stress-induced apoptosis. *Oncogene* 21, 3872-3878 (2002).
22. M. Cervellera, G. Raschella, G. Santilli, B. Tanno, A. VENTURA, C. Mancini, C. Sevignani, B. Calabretta and A. Sala. Direct transactivation of the anti-apoptotic gene apolipoprotein J (clusterin) by B-MYB. *J. Biol. Chem.* 275, 21055-21060 (2000).
23. M. Genuardi, A. Viel, D. Bonora, E. Capozzi, A. Bellacosa, F. Leonardi, R. Valle, A. VENTURA, M. Pedroni, M. Boiocchi and G. Neri. Characterization of MLH1 and MSH2 alternative splicing and its relevance to molecular testing of colorectal cancer susceptibility. *Hum Genet* 102, 15-20 (1998).

Review articles

24. Vidigal JA, ANDREA VENTURA. The biological functions of miRNAs: lessons from in vivo studies. *Trends Cell Biol.* 2014 Dec 4. pii: S0962-8924(14)00197-4. doi: 10.1016/j.tcb.2014.11.004. [Epub ahead of print] Review. PubMed PMID: 25484347.
25. Yoon-Chi Han and ANDREA VENTURA . Control of T(FH) differentiation by a microRNA cluster. *Nat. Immunol.* 14, 770-771 (2013).
26. Joana Alves Vidigal and ANDREA VENTURA. Embryonic stem cell miRNAs and their roles in development and disease. *Semin. Cancer Biol.* 22, 428-436 (2012). PMCID: PMC3426648
27. Carla P. Concepcion, Ciro Bonetti and ANDREA VENTURA. The microRNA-17-92 family of microRNA clusters in development and disease. *Cancer J* 18, 262-267 (2012). PMCID: PMC3592780.
28. Julien Sage and ANDREA VENTURA . miR than meets the eye. *Genes Dev.* 25, 1663-1667 (2011). PMCID: PMC3165930
29. ANDREA VENTURA and Tyler Jacks. MicroRNAs and cancer: short RNAs go a long way. *Cell* 136, 586-591 (2009). PMCID: PMC3910108
30. Peter Sandy, ANDREA VENTURA and Tyler Jacks. Mammalian RNAi: a practical guide. *BioTechniques* 39, 215-224 (2005).
31. ANDREA VENTURA and Pier Giuseppe Pelicci. Semaphorins: green light for redox signaling? *Sci. STKE* 2002, pe44 (2002).

Books and Chapters

1. **Ventura**, A., Kumar, M. S. & Jacks, T. 24 Roles of microRNAs in cancer and development. *MicroRNAs: from basic science to disease biology*, 322 (2008).