

CURRICULUM VITAE

Name Rugang Zhang, Ph.D.
Citizenship P.R. China; U.S.A. permanent residence

Education

1993, 9-1997, 7 B. Sc. Anhui Normal University, Anhui, China
1997, 9-2002, 9 Ph.D. Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences, Shanghai, China

Postgraduate training

2002, 6 – 2003, 5 Postdoctoral fellow at University of Pennsylvania, Philadelphia, USA.
2003, 6 – 2008, 10 Postdoctoral fellow at Fox Chase Cancer Center, Philadelphia, USA.

Faculty Appointments

2008, 11 – 2012, 3 Assistant Professor at Fox Chase Cancer Center, Philadelphia, USA.
2012, 4 – present Associate Professor at Wistar Institute, Philadelphia, USA.
2012, 11 – present Adjunct Associate Professor, Department of Genetics, School of Medicine, University of Pennsylvania, Philadelphia, USA.
2013, 2 – present Member, Cell and Molecular Biology Graduate Group, University of Pennsylvania, Philadelphia, USA.

Awards and Honors

1999 WEI-HUA Prize *by Chinese Academy of Sciences*
2000 DI-AO Prize *by Chinese Academy of Sciences*
2001 International Meeting Travel Award *by Shanghai-Unilever R&D Fund*
2001 DI-AO Prize *by Chinese Academy of Sciences*
2004 W. J. Avery Postdoctoral Fellowship *by Fox Chase Cancer Center*
2004 Glenn/AFAR Postdoctoral Fellowship *by American Federation of Aging Research*
2008 Liz Tilberis Scholar *by Ovarian Cancer Research Fund*
2009 Career Development Award *by FCCC/UPENN Ovarian SPORE*
2010 DoD Ovarian Cancer Academy Award *by Department of Defense OCRP*
2011 Highlighted Project *in CDMRP annual report*
2012 Highlighted Project *in CDMRP annual report*

Membership in Professional and Scientific Societies

2009-present Member of Gynecological Oncology Group
2011-present Member of American Association for Cancer Research

Federal Grant Review Committee Service

2009 *Scientific Reviewer* Hong Kong Research Grants Council
2010 *Scientific Reviewer* U.S. Army Medical Research Command (USAMRC),
Department of Defense (DoD) Ovarian Cancer Research Program
2011 *Scientific Reviewer* U.S. Army Medical Research Command (USAMRC),
Department of Defense (DoD) Ovarian Cancer Research Program
2012 *Scientific Reviewer* Poland National Science Center
2012 *Scientific Reviewer* Ovarian Cancer Research Fund
2012 *Scientific Reviewer* U.S. Army Medical Research Command (USAMRC),
Department of Defense (DoD) Ovarian Cancer Research Program
2013 *Scientific Reviewer* New Jersey Commission on Cancer Research
2013 *Scientific Reviewer* NIH/NCI Cancer Therapeutics Study Section
2013 *Scientific Reviewer* NIH/NCI Transition to Independence I Study Section

2013 *Scientific Reviewer* NIH/NCI Tumor Cell Biology Study Section

National and International Committee Service

2010 – present *Member of Committee on Experimental Medicine* Gynecological Oncology Group

Institutional Academic Committees

2008 *Member of postdoctoral day judge committee*, Fox Chase Cancer Center
 2009 *Member of faculty search committee*, EPC Keystone Program, Fox Chase Cancer Center
 2009 *Member of diversity committee*, Fox Chase Cancer Center
 2010 *Member of faculty search committee*, EPC Keystone Program, Fox Chase Cancer Center
 2010 *Member of postdoctoral day judge committee*, Fox Chase Cancer Center
 2010 – 2012 *Chair of Fox Chase-Russian graduate student program* Fox Chase Cancer Center
 2011 *Member of Temple Alliance Research Faculty Committee*, Fox Chase Cancer Center
 2011 *Member of internal pilot grant review committee*, Fox Chase Cancer Center
 2012 – present *Member of Committee on Appointment and Promotion*, The Wistar Institute
 2013 – present *Member of Faculty Council*, The Wistar Institute

Journal Review Activities

Editorial board member: *Cancer Research*, 2013- present

Review of manuscript for: *Aging Cell, Biochemical Pharmacology, British Journal of Pharmacology, Cancer Research, Cell Cycle, EMBO, Genes, Chromosomes and Cancer, Journal of Biological Chemistry, Molecular Cancer Therapeutics, Molecular Biology of Cell, Molecular Cancer Research, Molecular Carcinogenesis, Molecular and Cellular Biology, Oncogene, Plos, Tumor Biology etc*

Federal (NIH, DOD, VA) Funding History

Active:

NIH/NCI 1R01CA163377 (PI: Zhang, R.) NIH/NCI Role of EZH2 in epithelial ovarian cancer	8/18/2012 - 5/31/2017 Role: Principal Investigator
NIH/NCI 1R01CA160331 (PI: Zhang, R.) NIH/NCI Role of BRCA1 Pathway in Regulating Oncogene-Induced Senescence	6/1/2012 - 3/31/2017 Role: Principal Investigator
W81XWH-10-1-0823 (PI: Zhang, R.) Army Determine the Role of Canonical Wnt Signaling in Ovarian Tumorigenesis	9/15/2010 - 9/14/2015 Role: Principal Investigator
NCI-training grant (PI: Aird, K.M.) NCI/NIH Role of nucleotide metabolism in regulating cellular senescence	7/1/2012 – 6/31/2015 Role: Mentor
ACS postdoctoral fellowship (PI: Bitler, B.G.) American Cancer Society Role of ARID1A in ovarian cancer	1/1/2013 – 12/31/2015 Role: Mentor

Pending:

NIH/NCI 1R01CA181110-01 (PI: Zhang, R.) NIH/NCI	12/1/2013 – 11/30/2018 Role: Principal Investigator
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Role of nucleotide metabolic pathway in regulating oncogene-induced senescence

Completed:

FCCC-UPenn Ovarian SPORE (PI: Seiden, M.) 10/1/2011 – 9/30/2012
NIH/NCI Role: Investigator
Pilot Project: A Double Synthetic Lethal Strategy for BRCA1/2 Deficient Ovarian Cancer

FCCC-UPenn Career Development (PI: Dr. Seiden, M.) 12/1/2009 – 11/30/2011
NIH/NCI Role: Investigator
A novel BRCA1 inactivation mechanism in ovarian cancer

NCI-training grant (PI: Bitler, B.G.) 8/1/2010 – 7/31/2012
NCI/NIH Role: Mentor
Mechanism by which Wnt5a Suppresses Epithelial Ovarian Cancer

Non-Federal, Non-Industry Funding History (ACS, sub-specialty group, other)

LT/FCCC/01.08 (PI: Zhang, R.) 6/1/2009 - 5/31/2012
OCRF Role: Principal Investigator
Oncogene-Induced Senescence Suppresses Ovarian Carcinogenesis

PPD/FCCC/01.09 (PI: Godwin, A.) 4/1/2009 - 3/31/2012
OCRF Role: Co-Leader Proj 2
Program project: Therapeutic Targeting of the Tumor Microenvironment in Ovarian Cancer

Training Record

Graduate Student

Alyssa Kennedy, from Drexel University, 2009 - 2012
Azat Garipov, from Fox Chase Cancer Center – Russia Graduate Program, 2010 – present
Frances Xin, from University of Pennsylvania, 2013- present

Postdoctoral Fellow

Zhigang Tu, Ph.D. from Stevens Institute of Technology, 2008 – present
Hua Li, M.D., Ph.D. from Fudan University in China, 2009 – present
Katherine M. Aird, Ph.D. from Duke University, 2010 – present
Benjamin G. Bitler, Ph.D. from University of Arizona, 2010 – present
Michael Amatangelo, Ph.D. from Drexel University, 2012 – present
Hengrui Zhu, Ph.D. from Fudan University in China, 2013 – present

Medical Fellow

Angelan Jain, from Gynecological Oncology Medical Fellowship at Fox Chase Cancer Center, 2011-2012

Invited Talks and Participation in Conferences

Selected Invited Talks:

2007 University of Pittsburgh
2007 Wake Forest University
2007 Purdue University
2007 Medical College of Wisconsin
2009 GlaxoSmithKline at Collegeville, PA

2010 Johns Hopkins University
2010 Nanjing University, China
2010 GlaxoSmithKline at Collegeville, PA
2010 Novartis at Shanghai, China
2011 Institute of Biochemistry and Cell Biology, Chinese Academy of Science, China
2011 Southeast University, China
2011 Novartis at Cambridge, MA
2012 University of Pittsburg
2012 Temple University Fels Institute
2012 University of Pennsylvania Epigenetics Group
2013 New Jersey Institute for Cancer Research/Rutgers University
2013 Dana-Farber/Harvard Cancer Center Breast and Gynecological Cancer Symposium

Selected Participation in Conferences:

2004 Cold Spring Harbor Laboratory Meeting: Cancer Genetics & Tumor Suppressor Genes (Oral).
2005 FASEB Summer Research Conferences: Chromatin and Transcription (Oral).
2005 58th Annual GSA/AFAR Grantees Meeting (Poster).
2006 Cold Spring Harbor Laboratory Meeting: Mechanisms and Models of Cancer (Poster).
2007 AACR Annual Meeting (Oral).
2009 Salk Institute Meeting, Mechanisms and Models of Cancer (Poster).
2009 Philadelphia Chromatin Club Meeting (Oral).
2009 National Cancer Institute Translational Science Meeting (Poster).
2010 Cold Spring Harbor Laboratory Meeting, Genetics of Aging (Oral).
2010 Cold Spring Harbor Laboratory Meeting, Mechanisms and Models of Cancer (Poster).
2011 Cold Spring Harbor Laboratory Meeting, Translational Approaches to Cancer (Oral).
2011 AACR Annual Meeting (Poster)
2012 AACR Annual Meeting (Poster)
2012 3rd International Symposium on Ovarian Cancer (Oral).
2012 Cold Spring Harbor Laboratory Meeting, Mechanisms and Models of Cancer (Oral).
2012 Cold Spring Harbor Laboratory Meeting, Molecular Genetics of Aging (Oral).

Peer-Reviewed Publications

**** Corresponding author***

1. Amatangelo M., Garipov A., Li H., Conejo-Garcia J., Speicher D.W., **Zhang R ***. Three-dimensional culture sensitizes ovarian cancer cells to EZH2 inhibition. *Cell Cycle*, **2013**, in press.
2. Bitler B, Fink L, Wei Z, Peterson JR, **Zhang R ***. A high-content screening assay for small molecule modulators of oncogene-induced senescence. *J Biomol. Screening*, **2013**, in press.
3. Aird KM, Zhang G, Li H, Tu Z, Bitler BG, Garipov A, Wu H, Wei Z, Wagner SN, Herlyn M, **Zhang R ***. Suppression of nucleotide metabolism underlies the establishment and maintenance of oncogene-induced senescence. *Cell Reports*, 3: 1252-1265, **2013**.
(An invited mini-review based on this paper to be published in the journal *Cancer Letters*)
4. Tu Z, Zhuang X, Yao YG, **Zhang R ***. BRG1 is required for formation of senescence-associated heterochromatin foci induced by oncogenic RAS or BRCA1 loss. *Mol. Cell. Biol.* 33: 1819-1829, **2013**.
(An invited extra view based on this paper to be published in the journal *Cell Cycle*)

5. Garipov A., Li H., Thapa R.J., Balachandran S., **Zhang R.*** NF-YA underlies EZH2 upregulation and is essential for proliferation of human epithelial ovarian cancer cells. *Mol. Cancer Res.* 11: 360-369, **2013**.
(Highlighted in *Mol. Cancer Res.*)
6. Beer, L.A., Wang, H., Tang, H.Y., Cao, Z., Chang-Wong, T., Tanyi, J.L., **Zhang, R.**, Liu, Q., Speicher, D.W. Identification of multiple novel protein biomarkers shed by human serous ovarian tumors into the blood of immunocompromised mice and verified in patient sera. *Plos One*, 8: e60129, **2013**.
7. Aird K.M., **Zhang R.*** Detection of senescence-associated heterochromatin foci. *Methods Mol. Biol.* 965: 185-196, **2013**.
8. Li H., Cai Q., Wu H., Li T., Hua X., Sanchez-Beato M., **Zhang R.*** SUZ12 promotes human epithelial ovarian cancer by suppressing apoptosis via silencing HRK. *Mol. Cancer Res.* 10: 1462- 1472, **2012**.
9. Lee S., Rao S., Guitierrez A., Perrigoue J., Thapa R., Tu Z., Rhodes M., Anderson S., Oravec T., Downing J.R., **Zhang R.**, Balachandran S., Zambetti G., Testa J.R., Look A.T. and Wiest D. Mutations in the ribosomal protein L22 promote T lymphoid transformation by induction of the stemness factor, Lin28. *Blood*. 120: 3764-73, **2012**.
10. Li H., Bitler B.G., Maradeo M.E., Slifker M., Vathipadiekal V., Careasy C., Tummino P., Cairns P., Birrer M.J., **Zhang R.*** ALDH1A1 is a novel EZH2 target gene in epithelial ovarian cancer identified by genome-wide approaches. *Cancer Prev Res.* 5: 484-91, **2012**.
11. Tu Z., Nicodemus J., Beehary N., Xia B., Yen T. and **Zhang R.*** Oncogenic Ras regulates BRIP1 expression to induce dissociation of BRCA1 from chromatin, inhibit DNA repair, and promote senescence. *Dev. Cell* 21: 1077-91, **2011**.
(An invited extra-view published in the journal *Small GTPases*.)
12. Bitler B.G., Nicodemus J.P., Li H., Cai Q., Wu H., Hua X., Li T., Birrer M.J., Godwin A.K., Cairns P., **Zhang R.*** Wnt5a suppresses epithelial ovarian cancer by promoting cellular senescence. *Cancer Res.* 71:6184-94, **2011**.
13. Kennedy A.L., Morton J.P., Manoharan I., Nelson D.M., Jamieson N.B., Pawlikowski J.S., McBryan T., Doyle B., Oien K.A., Enders G.H., **Zhang R.**, Sansom O.J., Adams P.D. Activation of the PI3K3CA/AKT pathway suppresses senescence induced by an activated RAS oncogene to promote tumorigenesis. *Mol. Cell* 42: 36-49, **2011**.
14. Li H., Cai Q., Godwin A.K. and **Zhang R.*** Enhancer of zeste homology 2 promotes the proliferation and invasion of human epithelial cells. *Mol. Cancer Res.* 8: 1610-1618, **2010**.
(Highlighted in *Mol. Cancer Res.* 8: 1569, 2010)
15. Kennedy A.L., McBryan T., Enders G.H., Johnson F.B., **Zhang R.** and Adams P.D. Senescent mouse cells fails to overtly regulate the HIRA histone chaperone and do not form robust senescence-associated heterochromatin foci. *Cell Div.* 5:16, **2010**.
16. Pleshko A., Einarson M.B., Shalginskikh N., **Zhang R.**, Adams P.D., Skalka A.M. and Katz R.A. Identification of a functional network of human epigenetic silencing factors. *J. Biol. Chem.* 285: 422-433, **2010**.

17. Banumathy G., Somaiah N., **Zhang R.**, Schultz D., Andrade M., Ceulemans H., Adams P.D. Human UBN1 is an ortholog of yeast Hpc2 and participates in the HIRA/ASF1a chromatin-remodeling pathway in senescent cells. *Mol. Cell. Biol.* 29: 758-70, **2009**.
18. Poleshko A., Palagin I., **Zhang R.**, Boimel P., Castagna C., Adams P.D., Skalka A.M., Katz R.A. Identification of host factors that maintain retroviral epigenetic silencing: evidence for an antiviral response. *J. Virol.* 82: 2313 – 2323, **2008**.
19. **Zhang R.***, Adams P.D., Ye X. Design and application of an shRNA-based gene replacement retrovirus. *Methods Mol. Biol.* 408: 211-221, **2007**.
20. Ye X., Zerlanko B., Kennedy A., Banumathy G., **Zhang R.**, Adams P.D. Downregulation of Wnt signaling is an early signal for formation of facultative heterochromatin and onset of cellular senescence in primary human cells. *Mol. Cell* 27: 183-196, **2007**.
21. Ye X., Zerlanko B., **Zhang R.**, Somaiah N., Lipinski M., Salomoni P., Adams P.D. Definition of pRB- and p53- dependent and independent steps in HIRA/ASF1a-mediated formation of senescence-associated heterochromatin foci (SAHF). *Mol. Cell. Biol.* 27: 2452-2465, **2007**.
22. **Zhang R.**, Chen W., Adams P.D. Molecular dissection of formation of senescence-associated heterochromatin foci. *Mol. Cell. Biol.* 27: 2343-2358, **2007**.
23. (*Invited extra views in Cell Cycle* 6: 784-789, 2007.)
24. **Zhang R.**, Liu S.T., Chen W., Bonner M., Pehrson J.R., Yen T.J., Adams P.D. HP1 proteins are essential for a dynamic nuclear response that rescues the function of perturbed heterochromatin in primary human cells. *Mol. Cell. Biol.* 27: 949-962, **2007**.
25. **Zhang R.**, Poustovoitov M.V., Ye X., Santos H.A., Chen W., Daganzo S.M., Erzberger J.P., Serebriiskii I.G., Canutescu A.A., Dunbrack R.L., Pehrson J.R., Berger J.M., Kaufman P.D., Adams P.D. Formation of macroH2A-containing senescence-associated heterochromatin foci (SAHF) and senescence driven by ASF1a and HIRA. *Dev. Cell* 8: 19-30, **2005**.
26. (*Previewed in Mol. Cell* 17: 169- 170, 2005; *Highlighted in Nature signaling gateway and Nat. Rev. Mol. Cell Biol.* 6: 195, 2005.)
27. Vias H., **Zhang R.**, Reenstra W.W. Dibasic phosphorylation sites in the R domain of CFTR have stimulatory and inhibitory effects on channel activity. *Am. J. Physiol. Cell Physiol.* 287: C737-745, **2004**.
28. Daganzo S.M., Erzberger J.P., Lam W.M., Skordalakes E., **Zhang R.**, Franco A.A., Brill S.J., Adams P.D., Berger J.M., Kaufman P.D. Structure and function of the conserved core of histone deposition protein Asf1. *Curr. Biol.* 13: 2148-2158, **2003**.
29. **Zhang R.**, Zhang R.P., Wang X., Xie H. Effects of cisplatin on telomerase activity and telomere length in BEL-7404 human hepatoma cells. *Cell Res.* 12: 55-62, **2002**.
30. **Zhang R.**, Wang X., Guo L., Xie H. Growth inhibition of BEL-7404 human hepatoma cells by expression of mutant telomerase reverse transcriptase. *Int. J. Cancer* 97: 173-179, **2002**.
31. **Zhang R.**, Zhang R.P., Wang X., Xie H. Telomerase inhibition and telomere loss in BEL-7404 human hepatoma cells treated with doxorubicin. *World J. Gastroenterol.* 8: 827-831, **2002**.

32. **Zhang R.**, Wang X., Xie H. Telomerase activity inhibition and apoptosis induction of BEL-7404 human hepatoma cells by the antisense oligodeoxyribonucleotides to telomerase RNA component. *Chin. J. Exp. Biol.* 34: 213-218, **2001**.
33. Wang X., Yuan J., **Zhang R.**, Guo L., Xie Y., Xie H. Antihepatoma effect of alpha-fetoprotein antisense phosphorothioate oligodeoxyribonucleotides in vitro and in mice. *World J. Gastroenterol.* 7: 345-351, **2001**.
34. **Zhang R.**, Wang X., Yuan J., Guo L., Xie H. Using a non-radioisotopic quantitative TRAP-based method detecting telomerase activities in human hepatoma cells. *Cell Res.* 10: 71-77, **2000**.
35. **Zhang R.**, Wang X., Yuan J., Xie H. Human hepatoma cell telomerase activity inhibition and cell cycle modulation by its RNA component antisense oligodeoxyribonucleotides. *Acta Pharmacol. Sin.* 21: 742-746, **2000**.
36. Yuan J., Zhang R.P., **Zhang R.**, Guo L., Wang X., Luo D., Xie Y., Xie H. Growth-inhibiting effects of taxol on human liver cancer in vitro and in nude mice. *World J. Gastroenterol.* 6: 210-215, **2000**.
37. Wang X., **Zhang R.**, Xie H. Combined effect of alpha-fetoprotein antisense oligodeoxyribonucleotides and 5-fluorouracil on human hepatoma cell growth. *Chin. Med. J.* 112: 743-746, **1999**.

Editorial, Reviews and Book Chapters

1. Aird K.M., **Zhang R.** Nucleotide metabolism and oncogene-induced senescence. *Cancer Letters*, to be published in **2013**.
2. Tu Z., Aird K.M., **Zhang R.** Chromatin remodeling, BRCA1, SAHF and senescence. *Cell Cycle*, to be published in **2013**.
3. Li H., **Zhang R.** Role of EZH2 in epithelial ovarian cancer: from biological insights to therapeutic target. *Front Oncol.* 3: 47 doi: 10.3389/fonc.2013.00047, **2013**.
4. Tu Z., Aird K.M., **Zhang R.** RAS, cellular senescence and transformation: the BRCA1 DNA repair pathway at the crossroads. *Small GTPases.* 3: 163-167, **2012**.
5. **Zhang R.** and Adams P.D. Heterochromatin and its relationship to cell senescence and cancer therapy. *Cell Cycle* 6: 784-789, **2007**.
6. Adams P.D., **Zhang R.**, Poustovoitov M.V., Seeholzer S.H., Ohh M. Identification of associated proteins by coimmunoprecipitation. In *Protein-Protein Interactions: A Molecular Cloning Manual, 2nd edition*. Edited by Golemis E.A. and Adams P.D. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, **2005**.
7. **Zhang R.** and Xie H. Telomere and cell division. *J. Med. Sci.* 23: 377-380, **2001**.
8. Li H., Wang X., **Zhang R.**, Yuan J., Xie Y., Xie H. Discovery of new antimetastatic agents. Review of in vitro and in vivo screening methods. *Methods Find. Exp. Clin. Pharmacol.* 22: 123-128, **2000**.
9. **Zhang R.**, Yuan J., Wang X., Xu B., Xie H. Telomerase: a novel target of antitumor agents. *Chin. J. Cancer Res.* 12: 123-128, **2000**.

10. Zhang R., Wang X., Xie H. Progress on mechanism of telomerase activation. ***Prog. Biochem. Biophys.*** 27: 602-605, **2000**.
11. Zhang R., Yuan J., Xie H. Telomerase and tumor. ***Chin. J. Cell. Biol.*** 22: 25-27, **2000**.