BIOGRAPHICAL SKETCH

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NAME: White, Eileen

eRA COMMONS USER NAME (credential, e.g., agency login): EPWHITE

POSITION TITLE: Deputy Director, Chief Scientific Officer, Associate Director for Basic Research, Board of Governors Professor, Rutgers Cancer Institute, Associate Director, Ludwig Princeton Branch, Ludwig Institute for Cancer Research, Princeton University

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Rensselaer Polytechnic Institute, Troy, NY	BS	05/1977	Biology
Stony Brook University, Stony Brook, NY	PhD	06/1983	Biology
Cold Spring Harbor Laboratory, Cold Spring Harbor, NY	Postdoctoral Fellow	06/1986	Molecular Biology, Bruce Stillman, PhD

A. Personal Statement

The White Laboratory at Rutgers Cancer Institute of New Jersey has made important discoveries revealing the mechanisms and the roles of apoptosis, autophagy and metabolism in cancer using molecular, biochemical, and *in vivo* approaches (1-4). Significant discoveries include identification of (i) the function of a viral oncogene, (ii) mechanisms of apoptosis regulation by the BCL-2 family, (iii) the role for autophagy in promoting cancer (1,2), and (iv) how circulating nutrients feed tumor growth and survival (3, 4). The White group and collaborators identified the role of the catabolic process of autophagy in regulating mitochondrial function, cancer metabolism and tumor growth. Collaborations with leaders in the cancer field have enabled deployment of state-of-the-art technology in cancer metabolism (Drs. Joshua D. Rabinowitz), mouse models for cancer (Dr. Tyler Jacks), and cancer genomics and translational research (Drs. Shridar Ganesan, Chang Chan) to determine cancer mechanisms. As Deputy Director of Rutgers Cancer Institute of New Jersey, an NCI-designated Comprehensive Cancer Center, Dr. White oversees the scientific operation of the Center, recruits new faculty, and promotes collaborative basic and translational research across the Rutgers/Princeton University Cancer Center consortium. As Associate Director of the Ludwig Princeton Branch Dr. White facilitates cancer metabolism research at Princeton University.

Ongoing and recently completed projects that I would like to highlight include:

1OT2CA278609-01
White (PI), Goncalves, Janowitz (co-PIs)
06/01/22-05/31/2027
Cancer Cachexia Action Network

Fifth Generation, Inc.
White (PI)
03/01/2022-02/28/2025
Fasting and Cancer Prevention, Growth and Treatment

Deciphera Pharmaceuticals, LLC
White (PI)
06/09/2022-06/08/2025
Preclinical Analysis targeting Autophagy in Cancer with a Novel ULK1 Inhibitor

R01CA163591-07
White, Rabinowitz (Multi PI)
07/01/2018-06/30/2023
Tumor Cell Dependence on Host Metabolism

P30 CA072720
Libutti (PI)
03/01/2019-02/28/2024
Rutgers Cancer Center Support Grant

R01 CA243547
Ganesan, Lattime, White (Multi-PI)
12/01/2019-11/30/2024
Impact of Mutation Burden on Cancer Growth and the Immune Landscape

Ludwig Institute for Cancer Research
Rabinowitz (Director), White (Associate Director)
02/01/2021-01/31/2026
Ludwig Princeton Branch

Citations:

1. Rabinowitz JD, **White E**. 2010. Autophagy and metabolism. ***Science*** **330**: 1344-1348. PMCID:3010857
2. Guo JY, Xia B, **White E**. 2013. Autophagy-mediated tumor promotion. ***Cell*** **155**: 1216-1219. PMCID:3987898
3. Hui, S, Ghergurovich, J, Morscher, RJ, Cholsoon, J, Teng, X, Lu, W, Esparza, LA, Reya, T, Zhan, L, Guo, JY, **White, E**, and Rabinowitz, JD. 2017. Glucose feeds the TCA cycle via circulating lactate. ***Nature*** **551**: 115-118. PMCID:5898814
4. Poillet-Perez, L, Xie, X, Zhan, L, Yang, Y, Sharp, DW, Hu, ZS, Su, X, Maganti, A, Jiang, C, Lu, W, Zheng, H, Bosenberg, MW, Mehnert, JM, Guo, JY, Lattime, E, Rabinowitz, JD, and **White, E.** 2018. Autophagy maintains tumor growth through circulating arginine. ***Nature*** **563**: 569–573. PMCID:6287937

B. Positions, Scientific Appointments and Honors

Positions and Employment

2022-Present Board of Governors Professor, Rutgers University
2021- Present Associate Director, Ludwig Princeton Branch, Ludwig Institute for Cancer Research, Princeton University
2020- Present Co-director, Center of Excellence Cancer Immunology and Metabolism, Rutgers Cancer Institute
2017- Present Chief Scientific Officer, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ
2017- Present Co-founder, Vescor Therapeutics, LLC
2016- Present Deputy Director, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ
2005- Present Associate Director for Basic Research, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ
1998-2005 Investigator, Howard Hughes Medical Institute, Chevy Chase, MD
1997-2022 Distinguished Professor, Molecular Biology and Biochemistry, Rutgers University
1995-2020 Program Leader, Rutgers Cancer Institute of New Jersey
1986-1990 Staff Investigator, Cold Spring Harbor Laboratory
1983-1986 Postdoctoral Fellow, Damon Runyon-Walter Winchell Cancer Fund

Honors

2021 Elected Member, National Academy of Sciences, USA
2021 Elected Fellow, AACR Academy
2014 AACR Award, Most Cited Paper in *Molecular Cancer Research*
2011 Elected Fellow, American Association for the Advancement of Science

2010 Career Award, European Cell Death Organization
2010 Achievement Award, International Cell Death Society
2007 Elected Fellow, American Academy of Microbiology
2006 Mentoring Award, New Jersey Association for Biomedical Research
1994 Board of Trustees' Research Fellowship
1991-2012 MERIT Award (R37) National Cancer Institute
1983 Red Smith Award, Damon Runyon Foundation
1983-1986 Damon Runyon-Walter Winchell Postdoctoral Fellowship

B. Contributions to Science

1. **BCL-2 family of apoptosis regulators and their role in cancer -** I determined the function of an oncogene of a DNA tumor virus, the adenovirus E1B19K oncogene. E1B19K encodes a viral homologue of Bcl-2 that inhibits apoptosis by binding the proapoptotic proteins Bax and Bak. We established that the anti-apoptotic BCL-2 family member MCL-1 inhibits apoptosis by sequestering BAK. We identified the first BH3-only protein and provided the first evidence that proapoptotic BIM (BCL2L11) is a tumor suppressor deregulated in cancer and therapy. These discoveries helped to reveal the concept that inhibition of apoptosis is an important cancer-promoting function that can be modulated for cancer therapy.
    a. Han J, Sabbatini P, Perez D, Rao L, Modha D, **White E**. 1996. The E1B 19K protein blocks apoptosis by interacting with and inhibiting the p53-inducible and death-promoting Bax protein. ***Genes Dev* 10**: 461-477.
    b. Degenhardt K, Chen G, Lindsten T, **White E**. 2002. BAX and BAK mediate p53-independent suppression of tumorigenesis. ***Cancer Cell* 2**: 193-203.
    c. Cuconati A, Mukherjee C, Perez D, **White E**. 2003. DNA damage response and MCL-1 destruction initiate apoptosis in adenovirus-infected cells. ***Genes Dev* 17**: 2922-2932. PMCID:289151
    d. Tan TT, Degenhardt K, Nelson DA, Beaudoin B, Nieves-Neira W, Bouillet P, Villunger A, Adams JM, **White E**. 2005. Key roles of BIM-driven apoptosis in epithelial tumors and rational chemotherapy. ***Cancer Cell* 7**: 227-238.

2. **Oncogene activation triggers p53-dependent apoptosis -** I discovered that suppression of apoptosis is important for cancer promotion because activation of oncogenes such as the adenovirus E1A oncogene promotes apoptosis by activating p53. I established the paradigm that apoptosis is important for tumor suppression and explained why viruses encode apoptosis inhibitors.
    a. Rao L, Debbas M, Sabbatini P, Hockenbery D, Korsmeyer S, **White E**. 1992. The adenovirus E1A proteins induce apoptosis, which is inhibited by the E1B 19-kDa and Bcl-2 proteins. ***Proc Natl Acad Sci** U S A* **89**: 7742-7746. PMCID:49787
    b. Debbas M, **White E**. 1993. Wild-type p53 mediates apoptosis by E1A, which is inhibited by E1B. ***Genes Dev* 7**: 546-554.
    c. Chiou SK, Rao L, **White E**. 1994. Bcl-2 blocks p53-dependent apoptosis. ***Mol Cell Biol* 14**: 2556-2563. PMCID:358623
    d. Sabbatini P, Lin J, Levine AJ, **White E**. 1995. Essential role for p53-mediated transcription in E1A-induced apoptosis. ***Genes Dev* 9**: 2184-2192.

3. **Autophagy deficiency promotes tumor initiation -** Our work helped to reveal the context-dependent role of autophagy in cancer. We discovered that autophagy suppresses inflammation, that accumulation of the autophagy substrate p62 promotes tumorigenesis, and that loss of autophagy causes DNA damage and genome instability. We have proposed that autophagy suppresses chronic tissue damage and p62 accumulation that cause tumor initiation.
    a. Degenhardt K, Mathew R, Beaudoin B, Bray K, Anderson D, Chen G, Mukherjee C, Shi Y, Gelinas C, Fan Y, Nelson DA, Jin S, **White E**. 2006. Autophagy promotes tumor cell survival and restricts necrosis, inflammation, and tumorigenesis. ***Cancer Cell* 10**: 51-64. PMCID:2857533
    b. Mathew R, Kongara S, Beaudoin B, Karp CM, Bray K, Degenhardt K, Chen G, Jin S, **White E**. 2007. Autophagy suppresses tumor progression by limiting chromosomal instability. ***Genes Dev* 21**: 1367-1381. PMCID:1877749

c. Mathew R, Karp CM, Beaudoin B, Vuong N, Chen G, Chen HY, Bray K, Reddy A, Bhanot G, Gelinas C, DiPaola RS, Karantza-Wadsworth V, **White E**. 2009. Autophagy suppresses tumorigenesis through elimination of p62. ***Cell*** **137**: 1062-1075. PMCID:2802318
d. Mathew R, Khor S, Hackett SR, Rabinowitz JD, Perlman DH, **White E**. 2014. Functional role of autophagy-mediated proteome remodeling in cell survival signaling and innate immunity. ***Molecular Cell*** **55**: 916-930. PMCID:4169768

4. **Autophagy promotes tumor survival and malignancy -** In the context of established tumors, we discovered that autophagy is upregulated and promotes the survival of tumor cells in hypoxic tumor regions and in Ras- and Braf-driven cancers. We demonstrated for the first time that autophagy recycles intracellular macromolecules to support tumor cell metabolism and survival. We found that autophagy in tumor cells provides substrates to the TCA cycle for redox balance, energy homeostasis and nucleotide synthesis. This contributed to the concepts that some cancers are addicted to autophagy for survival and that Ras-driven cancers engage in nutrient scavenging and recycling to promote metabolism.
    a. Guo JY, Chen HY, Mathew R, Fan J, Strohecker AM, Karsli-Uzunbas G, Kamphorst JJ, Chen G, Lemons JM, Karantza V, Coller HA, DiPaola RS, Gelinas C, Rabinowitz JD, **White E**. 2011. Activated Ras requires autophagy to maintain oxidative metabolism and tumorigenesis. ***Genes Dev*** **25**: 460-470. PMCID:3049287
    b. Guo JY, Karsli-Uzunbas G, Mathew R, Aisner SC, Kamphorst JJ, Strohecker AM, Chen G, Price S, Lu W, Teng X, Snyder E, Santanam U, DiPaola RS, Jacks T, Rabinowitz JD, **White E**. 2013. Autophagy suppresses progression of K-ras-induced lung tumors to oncocytomas and maintains lipid homeostasis. ***Genes Dev*** **27**: 1447-1461. PMCID:3713426
    c. Strohecker AM, Guo JY, Karsli-Uzunbas G, Price SM, Chen GJ, Mathew R, McMahon M, **White E**. 2013. Autophagy sustains mitochondrial glutamine metabolism and growth of BrafV600E-driven lung tumors. ***Cancer Discov*** **3**: 1272-1285. PMCID:3823822
    d. Guo, J.Y., X. Teng, S.V. Laddha, S. Ma, S.C. Van Nostrand, Y. Yang, S. Khor, C.S. Chan, J.D. Rabinowitz, and **E. White**, Autophagy provides metabolic substrates to maintain energy charge and nucleotide pools in Ras-driven lung cancer cells. ***Genes Dev***, 2016. **30**(15): 1704-17. PMC5002976

5. **Tumors are selectively autophagy-dependent -** By conditionally knocking out an essential autophagy gene throughout adult mice we established that autophagy deficiency is tolerated in the short term. In contrast, we found that autophagy is essential for maintaining glucose homeostasis and survival when mice are fasted. We established that acutely ablating autophagy throughout mice with non-small cell lung cancer causes tumor regression prior to the destruction of normal tissues, demonstrating the selective dependence of tumors on autophagy and the utility of autophagy inhibition for cancer therapy. We also discovered that host autophagy also promotes tumor growth by sustaining the levels of circulating arginine by preventing the release of arginase from hepatocytes. Thus, autophagy promotes tumor growth by providing metabolic substrates in tumor cell autonomous and non-autonomous mechanisms. Finally, in the context of high mutation burden tumors, autophagy in hepatocytes suppresses an anti-tumor T-cell response to facilitate tumor progression.
    a. Karsli-Uzunbas G, Guo JY, Price S, Teng X, Laddha SV, Khor S, Kalaany NY, Jacks T, Chan CS, Rabinowitz JD, **White E**. 2014. Autophagy is required for glucose homeostasis and lung tumor maintenance. ***Cancer Discov*** **4**: 914-927. PMCID:4125614
    b. Poillet-Perez, L, Xie, X, Zhan, L, Yang, Y, Sharp, DW, Hu, ZS, Su, X, Maganti, A, Jiang, C, Lu, W, Zheng, H, Bosenberg, MW, Mehnert, JM, Guo, JY, Lattime, E, Rabinowitz, JD, and **White, E.** 2018. Autophagy maintains tumor growth through circulating arginine. ***Nature*** **563**: 569–573. PMCID:6287937
    c. Poillet-Perez, L., D.W. Sharp, Y. Yang, S.V. Laddha, M. Ibrahim, P.K. Bommareddy, Z.S. Hu, J. Vieth, M. Haas, M.W. Bosenberg, J.D. Rabinowitz, J. Cao, J.-L. Guan, S. Ganesan, C.S. Chan, J.M. Mehnert, E.C. Lattime, and **E. White**. Autophagy promotes growth of tumors with high mutational burden by inhibiting a T-cell immune response. ***Nature Cancer***, 2020. **1**(9): 923-934. PMCID:8409526

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/myncbi/1j1ynai_id6k-/bibliography/public/