ANNA A. POWOLNY

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EDUCATION

09/2001 – 06/2006	The Ohio State University Ph.D., Human Nutrition Interdisciplinary Ph.D. Program in Nutrition (OSUN) Adviser: Steven K. Clinton, M.D., Ph.D.	Columbus, Ohio
09/2001	University of Wroclaw M.S., Biotechnology Department of Molecular Biology and Biochemistry College of Natural Sciences	Wroclaw, Poland
08/1999 – 06/2000	University of North Carolina at Greensboro Exchange Program Department of Human Nutrition and Food Service Systems	Greensboro, North Carolina
06/1996 – 08/1999	University of Wroclaw B.S., Biotechnology Department of Molecular Biology and Biochemistry College of Natural Sciences	Wroclaw, Poland

TEACHING AND RESEARCH EXPERIENCE

08/2010– present	Lecturer, Biology Department Spelman College, Atlanta, Georgia
10/2010– 03/2011	Adjunct Faculty, Strayer University Chamblee Campus Atlanta, Georgia
07/2006 – 06/2010	Postdoctoral Research Associate, Hillman Cancer Center University of Pittsburgh Cancer Institute Department of Pharmacology and Chemical Biology, University of Pittsburgh, Pittsburgh, Pennsylvania

11/09/2009	Guest speaker at Advanced topics in cancer epidemiology and prevention Department of Epidemiology University of Pittsburgh, Pittsburgh, Pennsylvania
06/2007-06/2009	Instructor and mentor to an MD/PhD student working on this dissertation in Dr. Singh's laboratory, University of Pittsburgh Cancer Institute University of Pittsburgh, Pittsburgh, Pennsylvania
01/2003 – 06/2006	Graduate Research Associate, Comprehensive Cancer Center Department of Internal Medicine College of Medicine and Public Health, The Ohio State University, Columbus, Ohio
09/2002 – 01/2003	Graduate Teaching Associate, Advanced Course in Human Nutrition Department of Human Nutrition The Ohio State University, Columbus, Ohio
09/2001 – 08/2002	Graduate Research Associate, Department of Human Nutrition The Ohio State University, Columbus, Ohio
06/2000-06/2001	English Teacher Germanica, School of Foreign Languages Wroclaw, Poland

PROFESSIONAL SOCIETIES AND HONORS

American Association for Cancer Research, Associate Member	03/2006 – present
American Society for Nutrition, Member	04/2004 – 07/2010
Honorary Fellow of the University of Pittsburgh Institute of Aging	12/2008
Co-Founder and Leader of the Pharmacology and Chemical Biology Postdoctoral Seminar	10/2008 – 09/2009
Graduate Society of Nutritional Sciences, Chair of Professional Affairs	09/2005 – 06/2006
Graduate Society of Nutritional Sciences, Vice President	09/2004 – 09/2005
Annual State of Ohio Science Fair Judge	05/2005
Phi Kappa Phi Honor Society, Member	06/2003 – 06/2007
Graduate Society of Nutritional Sciences, Member	09/2001 – 06/2006

RESEARCH TECHNIQUES

Molecular biology

- Routine mammalian cell culture
- Western blot analysis and immunoprecipitation
- Total RNA extraction, reverse-transcriptase polymerase chain reaction (RT-PCR), real time PCR
- Gene microarray and SuperArray analysis
- Enzyme immunoassay (EIA), mitochondrial enzyme activity assays
- Apoptosis detection assays: TUNEL, DNA fragmentation, Annexin V
- Flow cytometry analyses
- Immunofluorescence
- Confocal microscopy

Histology

- Tissue grossing and embedding
- Paraffin block cutting on automated microtome
- Hematoxilin and eosin (H&E) staining
- Immunohistochemistry automated and manual
- Digital image capture and analysis

Animal procedures

- Rodent gavage
- Tumor inoculation
- Rodent necropsy
- Rodent breeding and genotyping
- Lifespan evaluation in C. elegans

Computer skills

- Microsoft Office 2007 Applications: Word, Excel, PowerPoint, Publisher
- GraphPad Prism 4.03 statistical analysis software
- Image-Pro Plus 5.0 histological analysis software
- Diagnostic Instruments SPOT 4.0 digital image capture software
- Adobe Illustrator and Photoshop CS2

PUBLICATIONS

1. **Powolny AA**, Bommareddy A, Hahm ER, Normolle DP, Beumer JH, Nelson JB, Singh SV. Chemopreventative potential of the cruciferous vegetable constituent phenethyl isothiocyanate in a mouse model of prostate cancer. J Natl Cancer Inst. 2011 Apr 6;103(7):571-84.

2. **Powolny AA**, Singh SV, Melov S, Hubbard A, Fisher AL, The garlic constituent diallyl trisulfide increases the lifespan of *C. elegans* via skn-1 activation. Exp Gerontol 2011 Jun;46(6):441-52. 2011 Feb 2.

3. **Powolny AA**, Singh SV. Dfferential response of normal (PrEC) and cancerous human prostate cells (PC-3) to phenethyl isothiocyanate-mediated changes in expression of antioxidant defense genes. Pharm Res. 2010 Dec;27(12):2766-75.

4. Xiao D*, **Powolny AA***, Barbi de Moura M, Kelly E, Bommareddy A, Kim S-H, Hahm E-R, Van Houten B, Singh SV, Phenethyl isothiocyanate inhibits oxidative phosphorylation to trigger reactive oxygen species-mediated death of human prostate cancer cells. J Biol Chem, 2010 Aug 20;285(34):26558-69. *Equal contribution

5. Mucci LA, **Powolny A**, Giovannucci E, Liao Z, Kenfield SA, Shen R, Stampfer MJ, Clinton SK. Prospective study of prostate tumor angiogenesis and cancer-specific mortality in the health professionals follow-up study. J Clin Oncol 2009 Nov 20;27(33):5627-33.

6. Xiao D*, **Powolny AA***, Antosiewicz J, Hahm ER, Bommareddy A, Zeng Y, Desai D, Amin S, Herman-Antosiewicz A, Singh SV. Cellular responses to cancer chemopreventive agent D,L-sulforaphane in human prostate cancer cells are initiated by mitochondrial reactive

oxygen species. Pharm Res. 2009, Jul;26(7):1729-38. *Equal contribution

7. Bommareddy A, Hahm ER, Xiao D, **Powolny AA**, Fisher AL, Yu J, Singh SV. Atg5 Regulates Phenethyl Isothiocyanate-induced Autophagic and Apoptotic Cell Death in Human Prostate Cancer Cells. Cancer Res. 2009 Apr 15; 69(8):3704-12.

8. Singh SV, Warin R, Xiao D, **Powolny AA**, Stan S, Arlotti JA, Zeng Y, Hahm ER, Bommareddy A. Sulforaphane Inhibits Prostate Carcinogenesis and Pulmonary Metastasis in TRAMP Mice in Association with Increased Cytotoxicity of Natural Killer Cells. Cancer Res. 2009 Mar 1;69(5):2117-25.

9. Singh SV, **Powolny AA**, Stan S, Xiao D, Arlotti JA, Warin R, Hahm ER, Marynowski S, Bommareddy A, Potter D, Dhir R. Garlic Constituent Diallyl Trisulfide Prevents Development of Poorly Differentiated Prostate Cancer and Pulmonary Metastasis Multiplicity in TRAMP Mice. Cancer Res. 2008; 68(22) Nov 15

10. Xiao D, **Powolny AA**, Singh SV. Benzyl isothiocyanate targets mitochondrial respiratory chain to trigger reactive oxygen species-dependent apoptosis in human breast cancer cells. J Biol Chem. 2008 Oct 31;283(44):30151-63. Epub 2008 Sep 3.

11. **Powolny AA**, Shivendra V. Singh. Multitargeted prevention and therapy of cancer by diallyl trisulfide and related *Allium* vegetable-derived organosulfur compounds. Special Issue of Cancer Letters (2008), Oct 8;269(2):305-14. Epub 2008 Jun24.

12. Antosiewicz J, Ziolkowski W, Kar S, **Powolny AA**, and Singh SV. Role of Reactive Oxygen Intermediates in Cellular Responses to Dietary Cancer Chemopreventive Agents. Special Issue of Planta Med. 2008 Oct;74(13):1570-9 Epub 2008 July 31.

13. **Powolny, AA**, Singh SV. Plumbagin-induced Apoptosis in Human Prostate Cancer Cells is Associated with Modulation of Cellular Redox Status and Generation of Reactive Oxygen Species. Pharm. Res. 2008 Sep;25(9):2171-80. Epub 2008 Jan 23.

14. **Powolny AA**, Carlton, PS, Wang, S, Hoot, DR, Clinton, SK. Interrelationships between dietary restriction, the IGF-I axis, and expression of vascular endothelial growth factor by prostate adenocarcinoma in rats. Mol Carcinogenesis. 2008 Jun;47(6):458-65.

15. Herman-Antosiewicz A, **Powolny AA**, Singh SV. Molecular targets of cancer chemoprevention by garlic-derived organosulfides. (Invited review). Acta Pharmacol Sin. 2007 Sep;**28**(9):1355-64.

16. Kim YA, Xiao D, Xiao H, **Powolny AA**, Lew KL, Reilly ML, Zeng Y, Wang Z, Singh SV. Mitochondria-mediated apoptosis by diallyl trisulfide in human prostate cancer cells is associated with generation of reactive oxygen species and regulated by Bax/Bak. Mol Cancer Ther. 2007; **6**(5):1599-609.

17. **Powolny AA,** Takahashi K, Hopkins RG, Loo G. Induction of GADD gene expression by phenethylisothiocyanate in human colon adenocarcinoma cells. *J Cell Biochem* 2003;**90**(6):1128-39.

18. **Powolny AA**, Xu J, Loo G. Deoxycholate induces DNA damage and apoptosis in human colon epithelial cells expressing either mutant or wild-type p53. *IJBCB* 2001;**33**:193-203

19. **Powolny AA**, Janska H. Intracellular gene transfer, (Review). *Advances Biochem* (Polish edition) 2000;**6:**263-273.

ABSTRACTS AND PRESENTATIONS:

1. Arlotti JA, Kim SH, Sehrawat A, Hahm ER, **Powolny AA**, Lee J, Beumer JH, Sakao K, Singh SV. Chemoprevention of mammary cancer in MMTV-*neu* transgenic mice by dietary administration of cruciferous vegetable constituent phenethyl isothiocyanate. *Proceedings of the American Association for Cancer Research* 2012;**53** (# 5563).

2. **Powolny AA,** Bommareddy A, Hahm ER, Normolle DP, Beumer JH, Nelson JB, Singh SV. Dietary phenethyl isothiocyanate administration inhibits prostate cancer development in transgenic adenocarcinoma of mouse prostate mice in association with induction of autophagy and suppression of plasma clusterin. *Proceedings of the American Association for Cancer Research* 2011;**52** (# 5563).

3. Singh SV, **Powolny AA**, Differential effect of phenethyl isothiocyanate on expression of antioxidant defense genes between normal and cancerous human prostate cells. *Proceedings of the American Association for Cancer Research* 2011;**52** (# 5583).

4. Powolny AA, Xiao D, Barbi de Moura M, Bommareddy A, Hahm ER, Van Houten B, Singh SV.Phenethyl isothiocyanate inhibits oxidative phosphorylation to initiate reactive oxygen species-mediated death of human prostate cancer cells *Proceedings of the American Association for Cancer Research* 2010;**51** (# 3792).

5. **Powolny AA**, Warin R, Xiao D, Stan SD, Arlotti JA, Zeng Y, Hahm ER, Marynowski SW, Bommareddy A, Desai D, Amin S, Chambers WH, Singh SV. Sulforaphane inhibits prostate carcinogenesis and pulmonary metastasis in TRAMP mice in association with reduced cell proliferation and increased apoptosis. *Proceedings of the American Association for Cancer Research* 2009;**50** (# 2101).

6. **Powolny AA**, Shen R, Clay K, Giovannucci E, Mucci LA, Clinton SK. A comparison of vascular architecture in prostate cancer and non-malignant prostate tissue at prostatectomy. *Proceedings of the American Association for Cancer Research* 2009;**50** (# 3188).

7. Xiao D, **Powolny AA**, Singh SV. Benzyl isothiocyanate-mediated bax activation and apoptosis induction in human breast cancer cells are triggered by mitochondria-derived reactive oxygen species *Proceedings of the American Association for Cancer Research* 2009;**50** (# 15).

8. Wong X, **Powolny AA**, Zeng Y, Xiao D, Badmaev V, Singh SV. Guggulipid, the extract from the Commiphora mukul tree, induces apoptosis in human prostate cancer cells by causing mitochondria-derived ROS generation. *Proceedings of the American Association for Cancer Research* 2009;**50** (# 954).

9. **Powolny, AA**, Singh SV. Plumbagin-induced Apoptosis in Human Prostate Cancer Cells is Associated with Modulation of Cellular Redox Status and Generation of Reactive Oxygen Species. *Proceedings of the American Association for Cancer Research* 2008;**49** (# 3830).

10. Clinton SK, **Powolny AA**, Liao Z, Shen R, Mucci L, Giovannucci E. Vascular architecture as a predictor of aggressive prostate cancer in men. *Proceedings of the American Association for Cancer Research* 2006;**47** (# 3688)

11. Wang S, Shen L, Carlton PS, Ang E, **Powolny AA**, DeGroff VL, Clinton SK. Gene Expression profiling of normal rat prostate tissue elucidates anti-carcinogenic mechanisms of dietary restriction*. Proceedings of the American Association for Cancer*

Research 2005;**46**:1222 (# 5178).

12. **Powolny AA**, Carlton PS, Wang S, Hoot DR, Clinton SK. Energy balance and prostate tumor angiogenesis: interrelationship between IGF-I and VEGF expression. *Frontiers in Cancer Prevention Research, American Association for Cancer Research* 2004;**3**:153 (C#24).

13. **Powolny AA**, DeIuliis J, and Holmes-McNary MQ. Carcinogen-induced oncogenesis mediated through NF-κB activation**.** *FASEB J* 2002;**736**:5.

14. DeIuliis J, **Powolny AA**, Holmes-McNary MQ. Trans-resveratrol attenuates DMBA-induced MAP kinase activity and NF-κB mediated cell survival gene expression. *FASEB J* 2002;**736**:4.

15. Hopkins RG, Mutamba SM, **Powolny AA**, Loo G. Effects of deoxycholate on GADD45 gene expression in HCT-116 colon adenocarcinoma cells. *FASEB J* 2002;215:10.

16. Loo G, Takahashi K, **Powolny AA** and Hopkins RG. Induction of GADD45 gene expression by phenylethyl isothiocyanate in HTC-116 human colon adenocarcinoma cells. *FASEB J* 2002;**17**:736:4

17. **Powolny AA**, Xu J, Loo G. Phenethylisothiocyanate induces DNA damage and apoptosis in human colon cancer cells. *FASEB J* 2001;**16**:499:8.

18. Loo G, **Powolny AA**, Xu J. Apoptotic effects of deoxycholate on colonocytes expressing either mutant or a wild-type p53 gene. *FASEB J* 2001;**15**:494:11

19. **Powolny AA**, Xu J, Loo G. Doexycholate induces DNA damage and apoptosis in human colon cancer cells. *FASEB J* 2000;**14**:531:3.

SCIENTIFIC INTERESTS

- Cancer chemoprevention using naturally occurring compounds with particular interest in prostate and breast carcinogenesis
- Investigations into the mechanistic relationship between aging and cancer.
- Influence of diet and naturally occurring dietary constituents on aging process
- Relationship between cancer progression and tumor angiogenesis.