

## CURRICULUM VITAE

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### Academic Background:

YEAR	DEGREE	SUBJECT(S)/UNIVERSITY
1988	Ph.D.	Biochemistry from the Australian National University, Canberra, Australia.
1982	M.Sc	Biochemistry from the University of Karachi, Karachi, Pakistan
1980	B.Sc	Biochemistry (Microbiology, Chemistry) from the University of Karachi, Karachi, Pakistan.

### Research Experience:

May-2002-present:	Professor (adj), Department of Medicine, Indiana University School of Medicine, Indianapolis, Indiana.
April, 2001- present:	Senior Investigator Director: Cellular Biochemistry Laboratory Director: Lipid Biology Laboratory Methodist Research Institute, Methodist Hospital of Indiana, Indianapolis
Jan., 2001-April, 2002:	Associate Professor (adjunct), Department of Biological Sciences, Indiana University-Purdue University, Indianapolis, Indiana
Jan.1999 – Mar.2001:	Associate Scientist/Director: Cellular Biochemistry Laboratory, Methodist Research Institute, Methodist Hospital of Indiana, Indianapolis, Indiana
July 1993 - Dec. 1998:	Research Scientist; Bone Marrow Transplantation Laboratory, Methodist Hospital of Indiana, Indianapolis, Indiana  Assistant Professor (adjunct), Department of Biological Sciences, Indiana University-Purdue University, Indianapolis, Indiana

- Dec. 1991 - July 1993: Research Associate; Department of Medicine and the Walther Oncology Center, Indiana University School of Medicine, Indianapolis, IN (with Yu-Chung Yang, PhD)
- June 1989 - Dec. 1991: Research Associate; Department of Molecular Physiology and Biophysics, Vanderbilt University School of Med. and the Howard Hughes Medical Institute, Nashville, TN (with John Exton, MD, PhD)
- June 1987 - May 1989: Post-doctoral Fellow; Department of Animal Science, Massey University, Palmerston North, New Zealand (with Stuart MuCutcheon, PhD)

### **Teaching Experience:**

- July 1, 2006 – present: Professor (adj), Foreign Faculty at Dr. Panjwani Center for Molecular Medicine and Drug Research, International Center for Chemical Sciences, University of Karachi, Ministry of Higher Education Commission, Islamabad, Pakistan.
- Dec 16, 02 - Jan 15, 03: Visiting Professor: HEJ Research Institute of chemistry, University of Karachi, Pakistan.  
Topic: Techniques on animal tissue culture
- Feb 20, - Mar. 21, 2000: Visiting Professor: HEJ Research Institute of chemistry, University of Karachi, Pakistan.  
Topic: Cellular pathways for programmed cell death  
Use of radioisotopes in Biology.
- Feb 1, - Mar.15, 1998: Visiting Professor: HEJ Research Institute of Chemistry, University of Karachi, Pakistan.  
Topic: Immunology and Cancer
- Dec. 10 - 31, 1996: Visiting Professor: HEJ Research Institute of Chemistry, University of Karachi, Pakistan.  
Topic: Molecular Mechanism of Inflammation
- Nov. 5 - 20, 1995: Visiting Professor: HEJ Research Institute of Chemistry, University of Karachi, Pakistan.  
Topic: Cellular Signalling
- Sep. 1980 - Dec. 1983: Lecturer: Department of Biochemistry, University of Karachi, Pakistan.  
Topics: Intermediary Metabolism; Enzymology; Endocrinology

## **Supervision of Student Research Projects:**

May 15-August 6, 2008

Docosahexaenoic acid and stearic acid have anti-proliferative effects on T-lineage acute lymphoblastic leukemia cells through alternative pathways.

Aaron Hudson (MRI-summer Student)

May 15-August 6, 2008

Parenteral lipid emulsion effects on human aortic endothelial cells

Jose Korte (MRI-summer student)

May 20-August 9, 2007

Breast Epithelial Cells at Various Stages of Cancer Have a Differential Expression of Acyl CoA: Cholesterol Acyl Transferase (ACAT)

Tyler Arnold (MRI summer student)

May 20-August 8, 2007

Characterization of anticancer properties of propofol-docosahexaenoate acid on breast cancer cells

Phillip Whitley (MRI-summer student)

January 10 – May 30, 2007

Effect of Trans fatty acids on lipid raft structure and function

Vishali Patel (Biology, IUPUI)

May 22 – August 10, 2006

Trans fatty acids induce proinflammatory responses and endothelial dysfunction

Tyler Arnold (MRI summer student)

January 10 , 2005- August 10, 2005

Effects of polyphenols on muscle proteolysis

Sarah Livingston (Biology, IUPUI Final year thesis)

January 10, 2005- August 10, 2005

Designing of chemotactic peptides

Tim Wiesel (Chemistry-IUPUI Final Year Thesis)

May 23 - August 9, 2005

Characterization of anti-cancer properties of polyphenol on breast cancer cells.

Diana Herrera (MRI-Summer student)

May 23 –August 9, 2005

Elucidation of signaling pathway for docosahexaenoic acid effects on Breast cancer cells.

Neil Patel (MRI-Summer student)

May 23 –August 9, 2005  
Characterization of an animal model for chronic sepsis.  
Miguel Ortiz (MRI-Summer student)

May 23-August, 2005  
Plasma and Tissue levels of trans fatty acids  
Lauren Cottee (MRI-Summer student)

May 15-August 10, 2004  
Role of the calpain proteolytic pathway in cancer-induced cachexia  
Heidi Yount (MRI-Summer Student Research Program)

May 15-August 10, 2004  
Omega-3 fatty acids: Apoptosis and membrane organization  
Laura Sech (MRI-Summer Student Research Program)

May 15- August 10, 2004  
The prevention of sudden death due to arrhythmia by diet rich in omega-3 fatty acids.  
Neal Patel (MRI-Summer Student Research Program)

May 15- August 10, 2004  
Staurosporine-induced changes in the phosphorylation state of connexin 43.  
Aaron Gingrich (MRI-Summer Student Research Program)

May, 2003 – April, 2005  
Effect of DHA-Resveratrol conjugate on breast cancer growth  
Kim Jackson (MS thesis, Department of Biology, IUPUI)

May 15, -August 10, 2003  
Effect of DHA on muscle proteolysis  
Heidi Yount (MRI-Summer Student Research Program)

May 15,- August 10, 2003:  
Analysis of commercial fish oil supplements  
Laura Sech (MRI-Summer Student Research Program)

May 10, 2002 - August 15, 2003:  
Effect of DHA on calcium mobilization in rat heart plasma membranes  
Maleha Asghar (IUPUI-Final year thesis)

May 15, - August 10, 2002:  
Effect of DHA on breast cancer growth  
Courtney Tate (Methodist Hospital Summer Scholarship program)

May 15, August 10, 2002:

Effect of low and high omega 3-fatty acid diets on rat heart performance  
Holly Hepker (Methodist Hospital Summer Scholarship Program)

May 15, - August 10, 2001:

Effect of DHA on cell cycle arrest  
Jacqueline Wiesehan (Methodist Hospital Summer Scholarship Program)

May 20, - August 20, 2000;

Prevention of DHA-induced apoptosis by phosphatidic acid  
Jacqueline Wiesehan (Methodist Hospital Summer Scholarship Program)

January 25, - August 20, 2000:

Role of DHA peroxidation in the induction of apoptosis.  
Masha N. Johnson (IUPUI Final year Thesis)

May 20, - August 20, 1999:

Induction of Apoptosis by DHA in Jurkat Leukemic Cell Line.  
Student: Kristiana Neff (Methodist Hospital Summer Scholarship Program)

May 20, - August 20, 1998:

Activation of Neutrophils Functions by Phosphatidic Acid-Enriched Membranes.  
Student: Melissa A. Bentz (Methodist Hospital Summer Scholarship Program)

May 15, - August 15, 1997:

Role of *ecto*-Phosphatidic Acid Phosphohydrolase in Neutrophil Chemotaxis.  
Student: April Bordes (Methodist Hospital Summer Scholarship Program)

May 15,- August 15, 1996:

Effect of Phosphatidic Acid on Human Neutrophil Chemotaxis.  
Student: Michael Edwards (Methodist Hospital Summer Scholarship Program)

May 15, 1994 - May 15, 1996:

Characterization of *ecto*-Phosphatidic acid Phosphohydrolase in Human Neutrophils.  
Student: Margaret Reeves (M.S Thesis, Department of Biological Sciences, Indiana University)

May 15, - August 15, 1995:

Regulation of *ecto*-Phosphatidic acid Phosphohydrolase in Human Neutrophils.  
Student: David Hasan (Methodist Hospital Summer Scholarship Program)

May 15, - August 15, 1995:

Effects of UV Radiation on Neutrophils functions  
Student: Kim Lee (Methodist Hospital Summer Scholarship Program)

May 15 - August 15, 1994:

Stimulation of Superoxide Release by Phosphatidic acid in Human Neutrophils.

Student: John Wentland (Research paper with Dr. J. G. N. Garcia, IU Medical School)

May 15 - August 15, 1993:

Signal Transduction by IL-11 in 3T3-L1 adipocytes.

Student: Olan Smith (Minority Summer Scholarship Program of IU)

June 11 - August 17, 1990:

Developmental pattern of Base Exchange and Transphosphatidylation Activities in Rat Liver Plasma Membranes.

Student: Jerel Raney (HHMI summer studentship program)

March 9 - July 26, 1988:

Reproductive Performance and Fetal Growth in Female Mice From Lines Divergently Selected on the Basis of Plasma IGF-1 Concentration.

Student: Carla Kroonsberg (visiting student from the University of Wageningen, The Netherlands)

January 9 - February 30, 1985:

Biochemical studies of Liver Metabolism in Tumour Bearing Cachectic Animals.

Student: Moira A. Clay (Leslie Vacation Scholarship, Australian National University)

### **Research Grants:**

**No Number**

**Siddiqui (PI)**

**4/1/08-03/30/11**

Baxter Nutrition, Deerfield, IL

The goal of this research is to develop lipid based nutrition therapies for chronically ill patients

Role: PI

**No Number**

**Siddiqui (PI)**

**1/1/09-12/31/09**

Abbott-Nutrition, Columbus, OH

The goal of this research is to screen ingredients for stimulating protein synthesis in muscle cells

Role: PI

**No number**

**Siddiqui (PI)**

**1/1/09-12/31/09**

Abbott-Cardiovascular, Abbott Park,, IL

The goal of this research is to understand the molecular mechanism of niacin-induced flushing response in the Langerhan cells

Role: PI

**No Number**

**Siddiqui (PI)**

**7/1/06-6/30/08**

Cook Biotech, West Lafayette, IN

The goal of this research is to characterize cellular growth on SIS-derived extracellular matrix.

Role: PI



**No Number** **Zieger (PI)** **7/1/02-6/30/04**  
Showalter Foundation, Indianapolis, IN  
Hypothermia-induced lipid peroxidation in bovine aortic endothelial cells  
The goal of this project was to investigate the hypothesis that hypothermia induces lipid peroxidation in bovine aortic endothelial cells, even in the absence of ischemia and reperfusion.  
Role: Co-Investigator

**No Number** **Siddiqui (PI)** **7/1/02-6/30/03**  
Showalter Foundation, Indianapolis, IN  
Effect of DHA on the prevention of chemically induced cardiac hypertrophy (continuation)  
The goal of this project was to characterize the effects of docosahexaenoic acid on the cellular and molecular signaling pathways that cause cardiac hypertrophy.  
Role: PI

**PO1 HL58064-01** **English (PI)** **2/1/98-1/30/01**  
National Institute of Health (NIH), Bethesda, MD  
Molecular regulation of endothelial cell permeability.  
The goals of this grant were to investigate phospholipase-linked pathway in endothelial cell permeability.  
Role: Co-investigator

**RO1 CA57212** **Jenski/Stillwell/ Siddiqui (Co-PI)** **8/1/98-7/30/99**  
National Institute of Health (NIH) Bethesda, MD  
Omega-3 Fatty Acid Consortium with Indiana University.  
The goal of this consortium was to investigate effects of docosahexaenoic acid on Jurkat leukemic cells.  
Role: Co- PI

**No Number** **Siddiqui (PI)** **7/1/01-6/30/02**  
Methodist Heart Institute Cardiovascular Research Committee, Indianapolis, IN  
Role of omega-3 fatty acids in the prevention of cardiac hypertrophy. The specific aims: (1) to characterize n-3 fatty acid-mediated inhibition of cytosolic calcium increase; (2) to study the effects of n-3 fatty acids on phosphorylation of S6 protein; and (3) to investigate the role of n-3 fatty acids in regulating cardiac hypertrophy-associated myofibrillogenesis.

Role: PI

**No Number** **Siddiqui (PI)** **7/1/99-6/30/02**  
Showalter Foundation  
Prevention of cardiac hypertrophy by Docosahexaenoic acid.  
The purpose of this grant was to investigate signaling mechanism for the effects of docosahexaenoic acid on cardiac hypertrophy.  
Role: PI

**INN-97-218-GIR** **Siddiqui (PI)\*** **7/1/97-6/30/99**  
American Heart Association (Indiana Affiliate)  
Interleukin-8 Synthesis by Migrating Leukocytes.

The goal of this study was to investigate properties of migrating neutrophils.

Role: PI

*\* (Grant received second best score)*

**No Number**

**Siddiqui (PI)**

**7/1/95-6/30/97**

Showalter Foundation, Indianapolis, IN

Effects of Phosphatidic acid on Endothelial cell membrane barrier dysfunction

The goals of this grant were to identify signaling targets for phosphatidic acid effect on endothelial cells.

Role: PI

**INN-94-058-GIA**

**Siddiqui (PI)**

**7/1/94-6/30/96**

American Heart Association (Indiana Affiliate)

Juxtacrine Regulation of Neutrophil-Endothelial Interactions

The goal of this grant was to study interaction of neutrophils with endothelial cells during inflammatory processes.

**Patents**

1. Lipid Conjugates, United States, pending, 2003, Institution-owned

**Awards and Distinctions:**

1. First Class First Position Gold Medals (B.Sc., 1978; M.Sc., 1980) by the University of Karachi, Karachi, Pakistan
2. The S.M. TAQI Gold Medal for the Best Student in the College for the year 1978 by Student's Union, Govt. Islamia Science College, Karachi, Pakistan.
3. The Australian National University Scholarship (1983-1988) for the degree of Doctor of Philosophy in Biochemistry
4. The American Heart Association's T. A. Kleckner award (1999)

**Memberships in Professional Societies:**

1. International Society for the Study of Fatty acids and Lipids (ISSFAL)
2. American Society of Biochemistry and Molecular Biology (ASBMB)
3. American Heart Association (AHA)
4. American Society of Leukocyte Biology
5. American Association for Cancer Research (AACR)
6. American Society of Cell Biology (ASCB)
7. Indiana Center of Vascular Biology and Medicine (ICVBM)
8. Indiana Chapter of Susan G. Koman Breast Cancer Foundation

## Professional Activities:

### 1. Editorial Boards:

*Journal of Molecular and Genetic Medicine*

Library Publishing Media, University of Oxford, Oxford OX13QU, England

*Research Journal of Cardiology*

ANSI, Academic Journals, New York, USA

*Biotechnology*

ANSI, Academic Journals, New York, USA

*Asian Journal Biochemistry*

ANSI, Academic Journals, New York, USA

*Asian J Cell Biology*

ANSI, Academic Journals, New York, USA

### 2. Reviewed manuscripts for:

Current Medicinal Chemistry, the Netherlands

IUBMB-Life, USA

Biochemical Pharmacology, USA

Comparative Biochemistry and Physiology, Canada

Lipids, USA

Life Science, USA

Journal of Lipid Research

Cancer Letters, USA

J. Clinical Immunology, USA

International J. Cancer, Germany

Bioorganic and Medicinal Chemistry, Japan

BMC-Cancer, UK

British Journal of Nutrition, UK

Journal of Nutrition Biochemistry, USA

Journal of Nutrition, USA

Nutrition in Clinical Practice, USA

Experimental Brain Research, USA

Prostaglandin, Leukotrienes & Essential fatty acids, UK

### 3. Reviewed Grants for:

Medical Research Council, UK

American Heart Association, Indianapolis, USA

Showalter Cardiovascular Research Trust, Indianapolis, USA

Cardiovascular Research Fund, Indianapolis, USA

Scottish Hospital Endowments Research Trust, Aberdeen, UK

Third World Academy of Sciences. Ankara, Turkey

Aga Khan Medical University, Karachi, Pakistan  
Susan G. Koman Cancer Research Foundation-National, Texas, USA  
Susan G. Koman for the Cure,-Indianapolis, USA

4. Member M.S/Ph.D thesis committees:  
Shala Zafar (MPhil, 1993-1996): University of Karachi, Pakistan  
Margaret Reeves (M.S, 1994-1996): IUPUI, Indianapolis, USA  
Zareen Amtul (PhD, 1996-2001): University of Karachi, Pakistan  
Denis Slayback (M.S, 1998-2001): IUPUI, Indianapolis, USA  
Raz Sheikh, (PhD, 2001-2004): IUPUI, Indianapolis, USA  
Kim Jackson (M.S, 2003-2004): IUPUI, Indianapolis, USA  
Jennifer Bush (PhD, 2004-2008), IUPUI, Indianapolis, USA
5. Serve on "Problem Solving Committee", Human Resources, Clarian Health Partner, Inc (1999-present).
6. Edited October 2004 issue of Mini-Reviews in Medicinal Chemistry on "Biological Mechanism of Macronutrient actions."
7. Edited November, 2000 issue of Current Organic Chemistry on "Omega-3 Fatty acids and Health"
8. Served as Judge for American Hearth Association's sponsored science award to High School Science Projects in Indiana, 1998-2000.

## List of Publications:

### Thesis:

1. Siddiqui, R.A. (1988). An enquiry into the metabolic basis of cancer cachexia using Walker 256 carcinosarcoma. (Ph.D. Thesis, Australian National University, Canberra, Australia, Supervisor: Dr. J. F. Williams).
2. Siddiqui, R.A. (1980). Effects of drugs on tryptophan-protein binding (M.Sc. Thesis, University of Karachi, Karachi, Supervisor: Dr. M. A. Haleem).

### Chapters in Books:

3. Stillwell, W., Shaikh, S.R., Lo Cascio, D., Siddiqui, R.A., Seo, J., Chapkin, R.S. and Wassall, S.R. (2006) Docosahexaenoic acid: an important membrane-altering omega-3 fatty acid. In *Frontiers in Nutrition Research*. J.D/ Huang, Ed. NOVA Science Publishers. New York, NY. Chapter 8, pp. 249-271.
4. Wassall, S.R., Shaikh, S.R., Brzustowicz, M.R., Cherezov, V., Siddiqui, R.A., Caffrey, M. and Stillwell, W. (2005). Interaction of polyunsaturated fatty acids with cholesterol: A role in lipid raft phase separation. *Bio-Colloids Symposium ACS Macromolecular Symposium Series In Press, Vol. 219*. (Eds. Danino, D., Harries, D., Wrenn, S.P.) Wiley-VCH. pp. 73-84.
5. Harvey, K., Cui, Yi., Akard, L., Jansen, J., Ash, R., Siddiqui, R.A., English D., (1994). Cytokine-stimulated up-regulation of protein tyrosine phosphatase in neutrophils.

In Progress in Clinical and Biological Research (ed. Diana Worthington-Shite, A. Gee & S Gross), Wiley-Liss & Co. N.Y. pp257-260.

### **Invited Articles:**

6. <sup>\*1</sup>Siddiqui, RA, Harvey, KA and Stillwell, W. Anticancer properties of oxidation products of docosahexaenoic acid. *Chem Phys Lipids* 2008:153;47-56
7. Siddiqui, RA, Harvey, KA, Miller, SJ, Zaloga, GP. Impact of Omega-3 and Trans fatty acids on Vascular Remodeling: Opposing Roles in Cardiovascular Health. *Current Enzyme Inhibition* 2008:4;60-72
8. <sup>\*2</sup>Siddiqui, R., Harvey, K., Zaloga, G., Stillwell, W. (2007) Modulation of lipid rafts by omega-3 fatty acids in inflammation and cancer: Implication for use of lipids during nutritional support. *Nutrition in Clinical Practice* 22:74-88.
9. Zaloga, G., Harvey, K., Stillwell, W., Siddiqui, R. (2006) Trans fatty acids and coronary heart disease. *Nutrition in Clinical Practice* 21, 505-512.
10. Siddiqui, R.A., Pandya, D., Harvey, K., and Zaloga, G.P. (2006) Nutrition modulation of cachexia/proteolysis. *Nutrition in Clinical Practice*. 21 (2): 155-167.
11. Zaloga, G.P., Siddiqui, R.A. (2006). A soluble ATP-Dependent proteolytic system is responsible for protein degradation. *Nutrition in Clinical Practice* 21 (1): 88-91
12. Zaloga, G.P., Siddiqui, R., Terry, C., Marik, P.E. (2004). Arginine: Mediator or modulator of sepsis? *Nutrition in Clinical Practice* 19: 201-215.
13. Siddiqui, R.A., Shaikh, S.R., Sech, L.A., Yount, H.R., Stillwell, W., Zaloga, G.P. (2004) Omega 3- fatty acids: Health benefits and cellular mechanism of action. *Mini-reviews in Med. Chem.* 4, 859- 871.
14. Zaloga, G.P., Siddiqui, R.A. (2004) Biologically active dietary peptides. *Mini-reviews in Med. Chem.* 4, 815-821.
15. Siddiqui, R.A., Labarrere, C.A., Kovacs, R.J. (2000). Prevention of cardiac hypertrophy in Omega 3-fatty acids: potential cell signaling targets. *Curr Org. Chem.* 4, 945-957.
16. English, D., Cui, Y., and Siddiqui, R. A. (1996). Messenger functions of phosphatidic acid. *Chem. Phy. Lipids* 80, 117-132.
17. Siddiqui, R. A., English, D. and Garcia, J. G. N. (1995). Rationale for juxtacrine regulation of neutrophil interactions with the stimulated endothelium. *J. Lab. Clin. Med.* 125, 18-25.

18. Siddiqui, R. A., Harvey, K., Akard, L., Jansen, J., Garcia, J. G. N. and English, D. (1994). The biochemistry of neutrophil-endothelial cell adhesion. *ISBBP Symp. Biochem. Biophys.* 1, 5-12.
19. Williams, J.F. and Siddiqui, R.A. (1990). Biochemistry of cancer cachexia: review of results, a new hypothesis and a proposal for treatment. *Med. Sci. Res.* 18:3-10.
20. Williams, J.F. and Siddiqui, R.A. (1989). Cancer cachexia: A hypothesis revisited and a proposal for treatment. *Cancer Forum* 13 (3):87-97.

### Peer Reviewed Articles:

21. <sup>\*3</sup>Harvey, K.A., Arnold, T., Rasool, T., Antalis, C, Miller, S.J., Siddiqui, R.A. (2008) Trans Fatty Acids Induce Pro-inflammatory Responses and Endothelial Cell Dysfunction. *British. J. Nutrition.* 99, 723-731.
22. Friedman, AN, Siddiqui, RA and Watkins, BA. Acute rise of omega-3 polyunsaturated fatty acids during hemodialysis treatment. *J. Renal Nutrition* 2008; 18:301-303.
23. Siddiqui, R.A., Harvey, K.A., Zaloga, GP (2008) Modulation of Enzymatic Activities by n-3 Polyunsaturated Fatty Acids to Support Cardiovascular Health. *J. Nutrition Biochem.* 2008; 19:417-437
24. Amtul, Z., Follmer, C., Mahboob, S., Rahman, A-U., Mazhar, M., Khan, KM., Siddiqui, R.A., Muhammad, S., Kazmi, S.A., and Choudhary, M.I. (2007) Germa- $\gamma$ -lactones as novel inhibitors of bacterial urease activity *Biochemical and Biophysical Research Communications* 35, 457-463.
25. Harvey, K., Parnavitana, C., Zaloga, G., and Siddiqui, R. (2007) Diverse signaling pathways regulate fibroblast differentiation and transformation through Rho kinase activation. *J Cell Physiol.* 211, 353-363.
26. <sup>\*4</sup>Zaloga, G.P., Ruzmetov, N., Harvey, K.A., Terry, C., Patel, N., Stillwell, W., and Siddiqui, R.A. (2006). Omega-3 Long Chain Polyunsaturated Fatty Acids Improve Survival Following Myocardial Infarction in Rats. *J Nutr.* 136, 1874-1878.
27. Zieger, M.A.J., Gupta, M. and Siddiqui, R.A. (2006). Endothelial cell fatty acid unsaturation mediates cold-induced oxidative stress. *J. Cell Biochem.* 99; 784-796.
28. Mesaik, M,A., Haq, Z-U., Murad S, Ismail, Z., Abdullah, N.R., Gill, H.K., Rahman, A-U., Yousaf, M., Siddiqui, R.A., Ahmad, A., Choudhary, M.I. (2006). Biological and molecular docking studies on coagulin-H: Human IL-2 novel natural inhibitor. *Mol Immunol.* 43, 1855-1863.

29. \*<sup>5</sup>Siddiqui, R.A., Zerouga, M., Wu, M., Castillo, A., Harvey, K., Zaloga, G.P., and Stillwell, W. (2005). Anticancer Properties of Propofol-Docosahexaenoate and Propofol-Eicosapentaenoate on Breast Cancer Cells. *Breast Cancer Res.* **R645-R654**
30. \*<sup>6</sup>Wu, M., Harvey, K.A., Ruzmetov, N., Welch, Z., Sech, L., Jackson, K., Stillwell, W., Zaloga, G.P., Siddiqui, R.A. (2005). Omega-3 polyunsaturated fatty acids attenuate breast cancer growth through activation of a neutral sphingomyelinase-mediated pathway. *Intl. J. Cancer* **117**, 340-348 (*see press releases at the end*).
31. Mesaik, M.A., Khan, K.M., Ullah, Z., Rahat, S., Choudhary M.I., Murad, S., Abdullah, R.N., Ismail, Z., Rahman, A.U., Siddiqui, R.A., Ahmad, A. (2005). Immunomodulatory Properties of Synthetic Imidazolone Derivatives. *Letts. Drug Design and Discovery* **2**, 490-496.
32. Slivova, V., Zaloga, G., DeMichele, S.J., Mukerji, P., Huang, Y.S, Siddiqui, R., Harvey, K., Valachovicova, T., and Sliva, D. (2005). Green tea polyphenols modulate secretion of urokinase plasminogen activator (uPA) and inhibit invasive behavior of breast cancer cells. *Nutrition and Cancer* **51**,66-73.
33. Stillwell, W., Shaikh, S.R., Zerouga, M., Siddiqui, R.A., Wassall, S.R. (2005). Docosahexaenoic acid affects cell signaling by altering lipid rafts. *Repro. Nutr. Dev.* **45**, 1-21.
34. Castillo, A., Ruzmetov, N., Harvey, K., Stillwell, W., Zaloga, G., Siddiqui, R. (2005). Docosahexaenoic Acid Inhibits Protein Kinase C Translocation/Activation and Cardiac Hypertrophy in Rat Cardiomyocytes. *J. Mol. Gene. Med.* **1**, 18-25.
35. Siddiqui, R.A., Shaikh, S.R., Stillwell, W., Zaloga, G.P. (2004) Inhibition of phenylephrin-induced cardiac hypertrophy by docosahexaenoic acid. *J. Cell. Biochem* **92**, 1141-1159.
36. Shaikh, S.R., Siddiqui, R.A., LoCascio, D., Stillwell, W., Wassall, S.R. (2004) A role for docosahexaenoic acid-containing phosphatidylethanolamine in lipid raft phase separations. *Biophys. J.* **87**, 1752-1766.
37. Shaikh, S.R., Dumauual, A.C., LoCascio, D., Siddiqui, R.A., Stillwell, W. (2003) Acyl chain unsaturation in PEs modulates phase separation in from lipid raft molecules. *Biochim. Biophys. Res. Comm.*, **311**,793-796.
38. Siddiqui, R.A., Jensi, L.J., Harvey, K., Wiesehan, J., Stillwell, W., Zaloga, G. (2003). Cell cycle arrest in Jurkat leukemic cells: a possible role for dososahexaenoic acid. *Biochem. J.*, **371**, 621-629.
39. Vasquez, C., Siddiqui, R.A., Moreno, A.P., Berbari, E.J. (2002) A fibroblast-myocyte model which accounts for slow conductance and fractionated electrogram in Infarct border zones. *Computers in Cardiology* **29**, 245-248.

40. Harvey, K., Siddiqui, R.A., Sliva, D., Garcia, J.G.N., and English, D. (2002) Serum factors involved in human microvascular endothelial cell morphogenesis. *J. Lab. Clin. Med.* 140, 188-198.
41. Amtul Z., Rahman, A.U., Siddiqui, R.A, Choudhary, M.I. (2002) Chemistry and Mechanism of Urease Inhibition. *Current Medicinal Chemistry.* 9, 1323-1348.
42. Siddiqui, R.A., Jensi, L, Wiesehan, J., Hunter M., Kovacs, R.J., and Stillwell, W. (2001) Prevention of DHA-induced cytotoxicity by phosphatidic acid in Jurkat leukemic cells: The role of protein phosphatase 1 in DHA-induced apoptosis. *Biochem Biophys Acta.* 1541, 188-200.
43. Xio, H., Siddiqui, R.A., Al-Hassani, M. A., Sliva, D., Kovacs, R. J. (2001) Phospholipids released from activated platelets improve platelet aggregation and endothelial cell migration. *Platelets* 12, 163-170.
44. Siddiqui, R.A., Jensi, L., Neff., K., Harvey, K., Kovacs, R.J., Stillwell, W. (2001) Docosahexaenoic acid induces apoptosis in Jurkat cells by a protein phosphatase-mediated process. *Biochem Biophys Acta* 1499(3), 265-275.
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### **Research Presentation/Abstracts:**

79. Siddiqui, R.A., Ruzmetov, N., Harvey, K., Arnold, T., Hassan, S., Rasool, T and Antalis, C. (2007) *Trans Fatty Acids Promote Atherosclerotic Lesions and Induce Sudden Cardiac Death.* 47<sup>th</sup> Annual Conference on cardiovascular diseases, American heart Association, February 28-March 3, Orlando, Florida.
80. Siddiqui, R., Ruzmetov, N., Harvey, K., Arnold, T., Antalis, C. and Zaloga, G. *Trans Fatty Acids Promote Atherosclerosis and Sudden Cardiac Death in Experimental Models.* 5<sup>th</sup> EuroFed Lipid Congress, September 16-19, Gothenburg, Sweden
81. Antalis, C., Buhman, K.K., and Siddiqui, R.A. Differential expression of ACAT-1 and ACAT-2 in mammary epithelial cells at various stages of transformation. 2<sup>nd</sup> Annual Symposium on The Role of Dietary Fatty Acids in the Prevention and treatment of Disease. October 24-26, Winston-Salem, NC
82. Siddiqui, R.A. (2007). Role of dietary fatty acids on vasculature. Department of Physiology, Indiana University Medical School, September 1, 2007
83. Siddiqui, R.A., Hassan, S., Harvey, K., Das, T., Mukerji, P., and DeMichele, S (2007). Attenuation of muscle loss and proteolysis by curcumin C3 complex in MAC-16 tumor-bearing mice. 4<sup>th</sup> Cachexia Conference, December 5-9, Tampa, FL
84. Siddiqui, R.A., Harvey, K., Arnold, T., Rasool, T., Antalis, C. (2006) *Trans Fatty Acids Induce Pro-inflammatory Responses and Endothelial Dysfunction.* American Society of Cell Biology, 46<sup>th</sup> annual meeting. December 9-13, San Diego.

85. Ruzmetov, N., Sosa, M., Courtney, N., Siddiqui, R. Anesthesia, mechanical ventilation and related complications in rodents. *Adequacy of Anesthesia and Modern Technologies in Intensive Therapy. September 7-9, 2006, Samarkand, Uzbekistan. (Talk presented by Dr. Ruzmetov).*
86. Siddiqui, R., Tyler, A., Harvey, K., Hassan, S., Antalis, C. Trans Fatty Acids Promote Atherosclerotic Lesions and Induce Sudden Cardiac Death. *Indiana Center for Vascular Biology and Medicine, September, 25, 2006. (Invited talk presented by Dr. Siddiqui).*
87. Siddiqui, R.A., Harvey, K.A., Herera, D., Patel, N., Paronavitana C., Stillwell W., Zaloga, G. (2006). Docosahexaenoic acid and polyphenols synergistically induce apoptosis in breast cancer cells by activating protein phosphatases. *Experimental Biology Meeting, April 1-6, San Francisco.*
88. Zhang Y., Siddiqui, R.A., Zaloga, G.P., Ingram, D.A., Rehman, J (2006) Modulation of endothelial progenitor cells by polyunsaturated omega-3 fatty acids. *Experimental Biology Meeting, April 1-6, San Francisco.*
89. Paronavitana, C., Harvey, K., Siddiqui, RA. Omega-3 polyunsaturated fatty acids induce apoptosis in breast cancer cells through activation and translocation of neutral sphingomyelinase-2. *Experimental Biology, April 1-6, San Francisco.*
90. Siddiqui, R.A., Ruzmetov, N., Harvey, K.A., Stillwell, W., Zaloga, G. (2006) Omega-3 polyunsaturated fatty acids improve survival following myocardial infarction and inhibit phenylephrine-induced hypertrophy by regulating protein kinase activities. *Experimental Biology Meeting, April 1-6, San Francisco.*
91. Harvey, K.A., Paronavitana, C., Zaloga, G., Siddiqui, R.A. (2006) Rho Kinase activation through diverse receptor-mediated pathways regulates fibroblast differentiation and transformation. *Experimental Biology Meeting, April 1-6, San Francisco.*
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  - \*3: **Commentary presented on this article by “Euro-Nutrition” in January, 2008**
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**Rafat A Siddiqui**, Mustapha Zerouga, Min Wu, Alicia Castillo, Kevin Harvey, Gary P Zaloga,

William Stillwell Breast Cancer Research 2005, 7:R645-R654 (7 June

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Principal Scientist Dr. **Rafat Siddiqui** said on the basis of research results a

patch or ointment can now be formulated. He further said that there are now ...

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[WTHR-Channel 13: June 9th, 2005 5:00](#)

**FOX59:** June 21<sup>st</sup>, 2005 7:00 AM News

**TV42, TBN, WCLJ, DT56:** June 10<sup>th</sup>., 2005 3:00 PM

### **Radio Interviews:**

**WIBC (1070 AM)-** June 9<sup>th</sup> 4:00 PM

**WHHH 96.3-** June 16<sup>th</sup> 2:00 PM

**Wu M, Harvey K.A., Ruzmetov, N., Welch, Z., Sech, L., Jackson, K., Stillwell, W., Zaloga, G.P., Siddiqui, R.A. (2005) Omega-3 polyunsaturated fatty acids attenuate breast cancer growth through activation of a neutral sphingomyelinase-mediated pathway. *Intl. J. Cancer* 117, 340-348**

[Dietary fish oil curbs breast cancer progression in animal study \*Last Updated: 2005-11-24 12:44:08 -0400 \(Reuters Health\)\*](#)

NEW YORK (Reuters Health) - The growth of breast cancer cells in culture and in mice is inhibited by omega-3 fatty acids, scientists report in a fast track article in the November 10<sup>th</sup> International Journal of Cancer.

According to Dr. Rafat A. Siddiqui from the Methodist Research Institute, Clarian Health Partners in Indianapolis, "Omega-3 fatty acids activate an enzyme called sphingomyelinase, which generates the release of ceramide, a compound that ultimately causes cancer cell death." Most American and British diets are high in omega-6 fatty acids (common in beef products) and low in omega-3 fatty acids (common in fish oils), noted the researcher. In a number of human studies, diets rich in omega-3 fatty acids were associated with a lower risk of breast and colon cancers. However, the mechanisms by which these dietary fats affect development and growth of cancers has been unclear.

Dr. Siddiqui and colleagues set out to determine if dietary lipids could modulate growth of breast cancer cells in animals and to determine the cellular mechanisms by which dietary lipids alter growth of breast cancer cells.

In the animal study, mice were fed diets rich in omega-3 (fish oil) or omega-6 (corn oil) fatty acids. Three weeks after implantation of breast cancer cells, tumor volume and weight were significantly lower in the omega-3 group compared with the omega-6 group.

The omega-3-rich diet also led to a 40% increase in sphingomyelinase and increased expression of p21, which is associated with growth arrest.

Similar results were seen in cultured breast cancer cells.

"Our study shows that dietary intake of different fatty acids affects the growth of breast cancer cells," Dr. Siddiqui said.

"Dietary fatty acids," he explained, "are incorporated into cell membranes, and the type of fatty acids dictates the localization of key signaling molecules within the cell. These signaling molecules then regulate cell growth."

"Our studies indicate that sphingomyelinase, an enzyme usually present in lipid rafts located within the cell membrane, changes its localization in the cell in the presence of omega-3 fatty acids, possibly due to changes in the structure of the lipid rafts," the researcher said.

This study, Dr. Siddiqui concluded, "suggests that incorporating moderate amounts of omega-3 fatty acids into the diet may decrease breast cancer progression. Importantly, omega-3 fatty acids are already known to have beneficial cardiovascular effects in humans."

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### **Fish oil shows promise in treating cancer**

**Indianapolis, Nov. 29-** "I was diagnosed six months ago and I had stage four primary breast cancer." Melody West-Marple is in the fight of her life, a pea size growth on her clavical diagnosed as breast cancer.

"It has changed my whole life."

After chemotherapy, radiation and hormone therapy are ahead.

Melody is changing her diet too. "I'm doing the the supplements, the vitamins, the diet, the exercise, I'm doing all this stuff to fight it."

That's exactly what Methodist researcher Rafat Siddiqui says she should do after his US Department of Army research funded study of Omega 3 fatty acids found in fish oil. "What we found was including a little bit of Omega 3 fatty acid in diet actually slows down the growth of cancer."

Pictures illustrate his findings. In rats transplanted with breast cancer tumors, when given corn oil the tumor is red, swollen and larger. The tumor is smaller in the rat given a combination corn and fish oil. And it's hard to detect in the rat given fish oil alone.

"By changing your diet," says Siddiqui, "you basically change the composition of your cells."

That change in breast cancer cells disturbs the growth signal and inhibits the metasis, or movement of cancer cells from one place to another.

A chart shows the decline, inhibited cancer cell growth from 25 to 80 percent.

At your local Kroger you can get fish oil in tablet form. Fish like wild salmon and tuna, not light but white, gives twice the punch. Eggs are now fortified. Cereals from regular to oatmeal are all ways to get your one to two grams of Omega 3 a day.

Melody says "If that is what I have to do to stay around, then that is what I am going to do. I am too young to die."

### **TV Interviews:**

**WTHR-Channel 13:** November 29<sup>th</sup>, 2005. 5:00 PM News

**FOX59:** Dec 6, 2005. 7:00 AM News