Mohammad Afzal

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Professor (Retired, 2017), Department of Biological Sciences,
Faculty of Science, Kuwait University,
P. O. Box 5969, Safat-13060, Kuwait.

48 years of Teaching, Research/Administrative Experience
RG Score 36.82; h-index 38
Citations 1,697; Reads 13,690

Research Grants 33, Publications 130, International Conference Presentations 82.

Research Interests: Pharmacognosy; microbial secondary metabolism, microbial transformations, membrane lipids, toxicology, stress metabolites in plants.

Instrumental/Techniques: LC/MS/MS, GC/MS/MS, ICP/MS; Perp-LC, FTIR, separation/purification techniques.

Academic Qualifications:

Ph.D. 1968	University of Wales, Swansea, UK
M.Sc. 1964	University of the Punjab, Lahore, Pakistan
B.Sc. Hons. 1963	University of the Punjab, Lahore, Pakistan
B.Sc. 1961	University of the Punjab, Lahore, Pakistan

Ph.D. Thesis Title

Studies relating to the biogenesis of complex natural phenolic compounds

Master's Thesis Title

Alkylation reactions of biogenic-amines in aqueous medium

Research Interest

Food and environmental toxicology, steroids & related compounds, thermophilic bacterial catalyzed biotransformations, heavy metal toxicity, carotenoids, steroids, terpenoids, phenolics, separation methods, GC, HPLC etc, spectroscopy, NMR & MS

Development of New Research Fields

- Using thermophiles from desert environment for biotransformation of steroids, polyaromatic hydrocarbons, bile acids, aromatic amino acids etc.
- New curcumanoids their glycosylation and antimicrobial activities, metal
  - chelation and toxicity.
- Chemistry and biochemistry of free radicals, their effect on aging and age related
  - diseases.
- Phytochemistry: herbal medicine: from kitchen to pharmacy.

Scholarships and Awards

- **Faiza Al-Kharafi Research award, Kuwait University, 2006**
- **Best Research Award for 2001-2002, by Kuwait University**.
- **Sabbatical leave from Kuwait University, 1988-1989**. Worked as a *distinguished scientist* at the Department of Biochemistry and Biophysics, University of California, Davis. Work involved Periwinkle tissue culture for the development of Periwinkle alkaloids.
- University of Kuwait summer grant to work with Professor S. Shibata, at the Meiji College of Pharmacy, Tokyo. This worked involved isolation of some peptides from *Camellia sinesis* by HPLC, and droplet counter current chromatography (DCCC) in 1983.
- University of Kuwait summer grant to work with Professor K. Hostettmann at the University of Lausanne, Switzerland, in June 1981, for isolation of some xanthones from environmental samples by droplet counter chromatography and centrifugal chromatography.
- British Agricultural Research Council fellowship to work at the University College of Swansea, Wales, UK. This work involved enzymatic and chemical oxidation of some phenolic peptides in the environment relating to lignin biosynthesis, with Professor A. Pelter, 1974.

- Japanese Ministry of Education to work as a Research Fellow at the School of Medicine, University of Hiroshima, Japan with Professor Osama Tanaka, in 1974. Work involved Natural Products Biosynthesis.

- Turkish Ministry of Higher Education to work as a Research Fellow at the University of Ezmir, Turkey, on Marine Environmental Naturals Products in 1972.

Positions Held

- **Professor**, (retired 2017), Biochemistry Program, Department of Biological Sciences, Kuwait University, Kuwait.

- **Chair**, Department of Biological Sciences, Nov. 2001-June 2006. The Department of Biological Sciences encompasses five departments including Biochemistry, Microbiology, Molecular Biology, Zoology and Botany. The department employs a Faculty of 65 Ph.Ds. specialized in various fields and over 200 supporting staff. The department offers B.Sc. and M.Sc. degrees in all the above fields.

- May 1987-June 2012, **Professor**, Dept. of Biological Sciences, Kuwait University, Kuwait. Duties involve teaching undergraduate and graduate students and supervision of graduate research. Honorary Professor at Small Animal Clinical Dept, Vet College, University of Florida at Gainesville, Florida, USA since 1999.

- **Editor-in-Chief**, Kuwait Journal of Science, 2013-2017

- **Sub Editor**, Kuwait Journal of Science & Engineering. June 2007-2012

- **Director, Graduate Program**, Dept. of Biological Sciences, Faculty of Science, Kuwait University, 1992-2001. Monitoring progress of graduate students. Chairman of Biochemistry graduate curriculum development committee.

- Member various committees, and Curriculum development for undergraduate and graduate programs in the Department of Biological Sciences and at the Faculty level. **Chairman** of Biochemistry Curriculum Development committee. Convener, Research Committee for the Department of Biological Sciences.

- **WHO consultant** at National Institute of Health, Islamabad, Pakistan to establish plant tissue culture laboratory for medicinal plants, 1997 (2 Months).

- **Visiting Professor** at Institute Scientific Research, Kuwait 2001 (6 months).

- **Consultant** (November 1990-July 1991) with the Agricultural Development Bank of Pakistan to establish a laboratory for plant tissue culture for potato crop development and ways to control environmental damage.

- **Visiting Professor (**September 1987-July 1988), Department of Biophysics & Biochemistry, University of California, Davis, USA Developed research program for plant tissue culture (Periwinkle).

- **Associate Professor**, September (1976-May-1987) Department of Biochemistry, Kuwait University, Kuwait. Duties: teaching undergraduate and graduate students and supervision of graduate research, member of various committees, program & courses development.

- **Associate Professor** (September 1975-September 1976), at the Department of Chemistry, University of Mosul, Iraq. Duties: teaching undergraduate and graduate students and supervision of graduate research, member various committees, program & courses development.

- **Post-Doctoral Research Fellow** (September 1974-September 1975), at the University of Swansea, Wales, UK. Work involved chemical and enzymatic oxidation of phenolic peptides relating to lignin biosynthesis.

- **Associate Professor** (September 1971-September 1974), at the Department of Chemistry, University of Mosul, Iraq. Duties: teaching undergraduate and graduate students and supervision of graduate research, member of various committees, program & courses development.

- **Lecturer** (September 1968-September), Dept. of Chemistry, University of Mosul, Iraq. Duties: teaching undergraduate and graduate students and supervision of graduate research, member various committees, program & courses development.

- **Research Demonstrator** (September 1966-September 1967), University College of Swansea, Wales, UK. Teaching duties involved tutorials and supervision of undergraduate laboratory work.

- **Research Assistant** (October 1961-September 1962), at the Pakistan Council of Scientific and Industrial Research Laboratories, Lahore. Work projects involved isolation of anthraquinones from *S. agiptica* and isolation of saponins from *M. buxifolia.*

Professional Affiliations

1. **C.Chem. FRSC** (Chartered Chemist and Fellow of Royal Society of Chemistry, U.K.), 1966-todate.
2. Member Oxygen Club of California
3. Member, Royal Pharmaceutical Society, U.K. 1976-todate
4. Member, Royal Society of Chemistry, U.K. Analytical Division, 1976-todate
5. Member, Agricultural and Biological Society, Japan, 1976-todate

- Member, International Society of Plant Tissue Culture, 1988-todate
- Member, American Public Health Association since 1997- todate
- Member International Society of Carotenoids 2000-todate
- Member, World Health, since 2000.
- Member American Plant Biologists, 1999.
- Member Spectroscopy Asia, 2004

Thesis supervision

Numerous students have worked under my direct supervision for the degree of M.Sc. at Kuwait University & others.

Research Grants **(Grants to-date $ 4.5 million)**

- Bacterial hydrocarbon degradation by *Calotropis procera*. Grant #SLO8/10- $ 49250.00.
- *Conocarpus lancifolius* under semi-arid conditions in the State of Kuwait: Ecological, Biochemical and Cytological Studies. $ 112,500.00, Phase I. SLO4/08 (KU) and 2007/1207/07 (KFAS). June, June, 2008-2014.
- *Conocarpus lancifolius* under semi-arid conditions in the State of Kuwait: Ecological, Biochemical and Cytological Studies, Phase II, 2014-2017, $ 189,000.00.
- Steroid compounds & anti-inflammatory, anitcancer activities in the epidermal gel secretions from the Arabian gulf catfish; SL)4/09, $ 1,87,790.00, 2011-2014 on going
- Fractionation of lipids and proteins from preparations from the skin of the Arabian gulf catfish and studies of their antiinflammatory and anticancer activities, Part1-4. Grant # 2013120701C; USD 1,071,515.
- A comparative study of two cucumber mosaic viruses (CMV) strains on biochemical parameters in infected tomato and squash plants, 10/14. $ 17,500.00.0
- Synergistic effect of turmeric and green tea extracts on inflammation in mouse model. SL07/15; 2015, $ 14,000.00.
- *Conocarpus lancifolius* under semi-arid conditions in the State of Kuwait: Ecological, Biochemical and Cytological Studies. Phase II. On going, 2012-2014, $ 192,500.00.
- Fatty acid profile of *Geobacillus stearothermophilus* under temperature and salinity stress. SY05/10. PI. M. Afzal. Co-PI Husain Al-Awadi. Grant value $ 19,565.00. Starting date 15/10/10. Finished 14/4/2013.
- Metabolism of progesterone by a thermophilic*Geobacillus gargensis*. SY04/10. PI. M. Afzal Co-PI Husain Al-Awadi. Grant $ 20,960.00 Starting date 15/10/10. Finished 14/4/2013

- Biotransformation of tryptophan to 5-hydroxytryptophanand serotonin catalyzed by a thermophilic*Geobacillus stearothermophilus*. Grant # SL03/09. Grant value $ 8000.00. Finished Jan. 2011.
- Plant derived anti-microbial and Anti-cancer agents Co-Investigator Grant # SL05/04 KU. April 1, 2006-March 31, 2009, Grant value = USD 180,000.00.
- Conocarpus lancifoilus: Ecophysiological, Biochemical and Cytological Studies under Semi-arid Conditions in the State of Kuwait. Co-Investigator Grant # KFAS 2007-1207-07, Finished June 2011, USD 180,000.0
- Environmental biotransformation of amino acids, bile acids and polyaromatic hydrocarbons by parent and mutant strains of thermophilic bacteria. Co-Investigator. Grant # SL04/05. April 16, 2006-April 15, 2009, Grant $ 131,180.00
- Environmental biotransformation of amino acids, bile acids and polyaromatic hydrocarbons by parent and mutant strains of thermophilic bacteria. Approved grant # SL04/05, Dec. 2005-2008, KU, RMU, $180,000.00
- Plant derived anti-microbial and anticancer agents. Approved grant # SL05/04, Dec. 2005—2008, KU, RMU, $257,965.00.
- Phytochemical Investigations of *Cordia Mixa*, May 2001-Nov.2005, Grant # SL02/02, $ 90,000, KU, RMU
- Estrogen and related steroid environmental biotransformation by thermophilic bacteria, SL 02/02, Sept. 2002- Aug. 2004, by KU, RMU, $ 80,000.0
- Steroid environmental biotransformation by thermopilic *Bacillus stearothermopilus*, Grant # SBO 40. Oct. 2000-Aug. 2002, $ 120,000, KU, RMU.
- Structural characterization of membrane lipids using FTIR and Near Infrared Fourier Transform Raman Spectroscopy, SB0 2/99, $ 25,000.0, April 2001, KU, RMU
- Monitoring Marine Environmental Pollution, Co. PI SBO-31, $350,000.0, Sept. 1995, by KU, RMU**.**
- Analysis of Renal Calculi by Fourier Transform Infrared Spectroscopy, SBO-34, $ 110,000.00. Approved Oct. 1993 by KU, RMU**.**
- Effects of Garlic and Onion in Vitro and in Vivo Animals Models of Thrombosis. Co. P.I. SBO 30, $ 80,000.00, April 1992, by KU RMU.
- Biomonitoring of Environmental Pollution in Kuwait. Co. PI SO-054 $ 110,000.00, 1992 by KU RMU.
- Co-investigator in a monumental research project on catfish launched by Professor J.M. Al-Hassan, 1985-1989, KU and KFAS grant $ 750,000.00.
- Genetic variations in mutant plant Cells and in vitro antitumor effect of some medicinal plant crude extracts Research Management Unit, Kuwait University Grant $40,000.00, 1989-1992.
- lipids of some plants belonging to *Liliaceae* family, Research Management Unit, Kuwait University grant $20,000.00, 1985-1986.
- Effect of paraquat on bile components in rabbits. Research Management Unit, Kuwait University Grant $125,000.00, 1987-1990.
- Purchase of a high powered HPLC unit with three detectors and a DU-7 Spectrophotometer for the Department of Biochemistry, Faculty of Science, 1986.
- Investigations of *Allium sativum*, Research Management Unit, Kuwait University Grant $20,000.00, *1984-85.*
- Investigations of components of *Theasinesis* Research Management Unit, Kuwait University Grant $ 70,000.00, 1983-1985.

- ❖ Investigations of the components of *Lawsonia innermis* Research Management Unit, Kuwait University grant $ 45,000.00, 1980-82.
- ❖ Investigations of the components of *Lawsonia innermis*, Kuwait Institute for Scientific Research grant $ 75,000.00, 1977-78

❖ International Conference Organization

1. Organized an International Conference "Free Radicals in Health and Disease" at the University of Kuwait. The conference was held March 18-21, 2007 and over 22 countries participated in the conference. The conference was a total success. Proceedings of the conference have been published in "Molecular Biotechnology" September 2007 issue.
2. Organized Kuwait Conference of Chemistry, March 20-22, 2016, under Kuwait Chemical Society. Presented a plenary lecture " Metabolite Finger printing of *Arnebia Decombens*"

Creative Activities

- ❖ Established modern laboratories for Environmental sciences/toxicology at the University of Mosul, Iraq and University of Kuwait. A laboratory for plant tissue culture was established at the University of Kuwait and for the Government of Pakistan at Islamabad, Pakistan for the production of virus free potato seeds. Currently my lab. is established with GC/MS, high powered LC/MS, spectrofluorometers, HPLC, flash chromatography etc.
- ❖ Established Friends Educational Foundation 2010 to offer financial support to research students in Chemistry, Biochemistry, Chemical Engineering.
- ❖ Established 2010, book collection program under the title "Donate a Book" Thousands of books were collected and shipped to Punjab University, Lahore, to place them in their libraries.

Academic Missions and Practical Training

- ✓ Sabbatical leave from the University of Kuwait at University of California, Plant Growth Laboratory, Davis, California, USA, 1987-88.
- ✓ Organized a training program on HPLC for staff and technicians working at Kuwait Institute for Scientific Research, 1987.
- ✓ Waters Associates training program for HPLC at Milford, Massachusetts, USA, 1986.
- ✓ Waters Associates training program for use of HPLC at the School of Medicine, University of Kuwait, Kuwait, in 1985.
- ✓ Shimadzu training program for HPLC users at Shimadzu Corporation Ltd., Shinjuku, Tokyo, Japan, in 1983.

- ✓ Perkin-Elmer training course at Kuwait University, Kuwait in 1982. This course offered extensive lectures and workshops in HPLC, gas chromatography and atomic absorption spectroscopy.
- ✓ Perkin-Elmer training course at Beaconsfield, Great Britain, in 1980. This course involved lectures and workshop about micro-techniques in Infra Red Spectroscopy.
- ✓ Varian MAT GMBH training course at Bremen, West Germany, 1980. This involved lectures and workshop for Mass Spectrometer use and trouble shooting.
- ✓ PyeUnicam Ltd., training course at Cambridge, Great Britain in 1981. This involved an extensive training program with workshop in high performance liquid chromatography.

Ongoing Research Interests

- Lipid Peroxidation as an indicator of environmental toxicity in animal studies. Formation and identification of fatty acid hydroperoxides and other derivatives by HPLC/MS, GC/M
- Polyunsaturated fatty acids, prostaglandins
- Environmental trans-fatty acids & toxicity.
- Conjugated Linoleic acid in human milk
- Plant extracts and antioxidants.
- Secondary metabolites from plants and their biological activity.
- Effect of massive oil pollution on Kuwaiti desert flora. Using plants as bioindicators for environmental pollution.
- Effect of oil pollutants on the biochemical parameters of plants.
- Biotransformation of steroids and related compounds
- Curcumanoid glycosylation and their antimicrobial activities
- Anticancer activities of Kuwaiti flora
- Thermophilic bacteria as hydrocarbon degraders

Conference Presentations

1. M. Afzal, J.S. Davis and C.H. Hassall. The Synthesis of Novel 2'2-,6-Tri-hydroxy- benzophenones and Related Spirodienones. Joint Ann. Meeting Chem. Soc. Meeting, Dublin, 1.8.1966.
2. J.M. Al-Hassan, R.S. Criddle, M. Afzal and M. Thomson. Lipid Composition of Gel Material Elaborated by the Arabian Gulf Catfish, *Arius thalassinus*, Ruppell. Am. Soc. Biol. Chem. Fed. Proc., 42, 1529, 1983.
3. J.M. Al-Hassan, M. Afzal, M. Ali, M. Thomson, S. Fayad and R.S. Criddle. Aspects of Lipid Contents of Gel Material Elaborated by the Arabian Gulf Catfish, *Arius thalassinus*, (Ruppell). Am. Soc. Biol. Chem. Fed. Proc., 44(5), 1601, 1985.
4. M. Afzal, R. H. A. Hassan, M. Ali, C. J. Gubler, and M. S. I. Dhami, Modulation of Triglycerides and Cholesterol Levels by Paraquat in Rabbits. ABSTRACT # 49. Canadian Congress of Laboratory Medicine and 32nd Annual Meeting of the Canadian Society of Clinical Chemists, Winnipeg, Manitoba June 25-30, 1988.
5. M. Afzal, R. A. H. Hassan, M. Ali, R. A. Fatah, M. Al-Naqeeb, L. Al-Ugaily, C. J. Gubler, and M. S. I. Dhami, Modification of Phospholipids and Fatty Acids by Paraquat in Liver and Kidney of Rabbits. Abstract # 205. Pacific Conference on Chemistry and Spectroscopy, American Chemical Society, 34th. Western Regional Meeting, San Francisco, California, October 26-28, 1988.
6. Raja Al-Fatah, M. Ali, M. Afzal and R.A. Hassan and M. S. I. Dhami,. Effect of Paraquat on Hepatic Enzymes in Rabbits. Abstract # 515, pp. 200-201. 155th National Meeting of the American Association for Advancement of Science, San Francisco, California, January 14-19, 1989.
7. M.S.I. Dhami, M. Afzal and B.A. Coyle. The Toxic Nature of Foodstuffs. 2nd. Symposium on Nutrition & Chiropractic, Iowa, April 12-14, 1989.
8. B.A. Coyle, M. Afzal and M.S.I. Dhami. Nature is a Significant Pollutant. 2nd. Symposium on Nutrition & Chiropractic, Iowa, April 12-14, 1989.
9. M.A. Ghannoum, M. Afzal, R.A.H. Hassan and M.SI. Dhami. Variation in Growth and Fatty Acid of *TrichodermaViride* Induced by Herbicides. X International Symposium on Drugs Affecting Lipid Metabolism, Houston, Texas, USA November 8-11, 1989. Doi:
10. M. Afzal, M. Ali, R.A.H. Hassan and M.S.I. Dhami. Possible Role of Prostanoids in the Control of Bronchial Asthma by Aloe Vera Extracts. X International Symposium on Drugs Affecting Lipid Metabolism, Houston, Texas, USA November 8-11, 1989.
11. M. S. I. Dhami and M. Afzal. Modification of Lipid Moieties of the Hepatic Endoplasmic Reticulum by Progesterone Metabolites in Female Rats Pretreated

with Melatonin. 10th. International Symposium on Drugs Affecting Lipid Metabolism, Houston, Texas, November 8-11, 1989.

12. M. Afzal, M. Ali, N. Mohammed, N. Al-Sweedan, A. Fareed and M.S.I. Dhami. Modulation of bile acids induced by paraquat in rabbits. Abstract #1665. Society of Toxicology, 31st Annual Meeting, Seattle WA, 1655, Feb. 23-27, 1992.

13. M. S. I. Dhami, M. Afzal and P.E. Jordan. How Pesticide Regulations Effect our Food Safety. 3rd. Symposium on Nutrition. PCC, Danvenport, Iowa, November 13-15, 1992.

14. M. S. I. Dhami, M. Afzal and P.E. Jordan. Changes in Drug Metabolizing Enzyme Activities and Lipids of Hepatic Endoplasmic Reticulum: Time of Day Effect. 32nd. Annual Meeting of the Society of Toxicology, New Orleans, LA, March 14-18, 1993.

15. M. Shahjahan, M. Afzal & M.S.I. Dhami. Characterization of Impurities in Non-Ionic Surfectants and Their Effect on Ultraviolet Light Absorbers. Society of Toxicology, New Orleans, USA March 14-18, 1993.

16. M. S. I. Dhami, M. Fan, M. Afzal and P. Martin. Immunotoxicity: Risk Assessment of Environmental chemicals, American Chemical Society Symposium on Risk Assessment, New Orleans, Feb. 1993.

17. M. Afzal, M. S. I. Dhami, P. E. Jordan, Changes in Drug Metabolizing Enzyme Activities and Lipids of Hepatic Endoplasmic Reticulum. Proceedings of Society of Toxicology, 13, 382 (1495), 1993.

18. M. S. I. Dhami, M. Menon, and M. Afzal, The Role of Circadian Fluctuation in the Expression of Toxicity, American Chemical Society Annual Meeting, San Diego, CA, March, 15, 1994.

19. M. Afzal, G. Malallah, M. S. I Dhami, D. Ibraham and M. Kurian, Biomonitoring Environmental Pollution, American Chemical Society Annual Meeting, San Deigo, California, March,13-17, 1994, Abst. #27.

20. M. Afzal, G. Malallah, M. S. I. Dhami, D. Ibraham and M. Kurian, Plants as bioindicators of environmental pollution in Kuwait, Federation of American Societies Experimental Biology (FASEB), Annual Meeting, Atlanta, Georgia, April 9-13, 1995, Abst. # 4138.

21. L. Hayat, M. Afzal and A. Ramadan, Detection of cations in malignant and benign brain tumors. The first international conference on trace elements, free radicals tumor markers, chromosomal analysis and cytokines in clinical medicine and biochemistry, Kuwait, March 20-23, 1995, Abs #155, pp 69-70.

22. M. Menon, M. S. I. Dhami, O. Parshad and M. Afzal, Incidence of COPD among mining and processing industry workers: Occupational exposure assessment, APHA. 123rd. Annual Meeting, San Diego, CA, Oct 29- Nov 2, 1995, Abst. # 121.

23. Ghanima Malallah, M. Afzal, Toxicity of anther tapetal cells due to oil pollution in Kuwaiti flora, 5th. SETAC-Duropean Congress, Copenhagen, June 25-28, 1995, p. 126.

24. L. Hayat, M. Afzal and A. Ramadan, Lipid pattern in brain tumors. The First Asia-Pacific Anatomical Conference, Dec. 17-20, 1995, Abs. 56 pp. 68, Singapore.

25. M. Afzal, S. Gulshan, M. Kurian and M. Magdi, Biochemical changes in virus infected tomato plants. Experimental Biology, 1996, Annual meeting, Bethesda, Maryland, USA, Abst. # 1119.

26. Janjua, M., Dhami, M.S.I., Menon, M., Afzal, M. Environmental Issues of leaking underground storage tanks:Understanding health risks from gasoline contamination. 3rd. National Symposium on Modern Trends in Contemporary Chemistry:Environmental Pollution, Islamabad, Pakistan, Feb. 24-26, 1996.

27. Janjua, M., Dhami, M.S.I., Menon, M., Afzal, M. The water:How clean is clean to drink? 22nd. International Nathiagali Summer College on Physics and Contemporary Need. Nathiagali, Islamabad, Pakistan, July 26, 1997.

28. Dhami, M.S.I., Menon, M., Janjua, M., Afzal, M. Dow Chemical Company's Nightmare of Dioxin:Exposure and Risk Assessment. 22nd. International Nathiagali College on Physics and contemporary Need. July 26, 1997, Nathiagali, Islamabad, Pakistan.

29. M. Afzal, L. Hayat, M. Al-Sughayer, M. Menon and M. S. I. Dhami, Human breast milk and substitutes: A comparative study of fatty acids. American Public Health Association, 126th Annual Meeting, Nov 15-18, 1998, Abs. #1022

30. M. Afzal, L. Hayat, M. Al-Sughayer, M. Menon and M. S. I. Dhami, Human brest milk and substitutes: A comparative study of fatty acids. American Public Health Association, 126th Annual Meeting, Nov 15-18, 1998, Abs. # 2104

31. M. Abaza, M. Afzal and M. Ghoreishi, Plant derived anticancer agents, Federation of Amer. Soc. Exp. Biol. (FASEB), Boston, Massachusetts, June, 4-8, 2000.

32. M. Afzal, Sameera Al-Awadi and S. Oommen, Transformation of progesterone to a new metabolite 9,10-seco-4-pregnene-3,9,20-trione and other hydroxylated metabolites. Federation of Experimental Biology, (FASEB), New Orleans, April 18-24, 2002, Abstract # E54, 445.1 P. 155.

33. M. Afzal, Sameera Al-Awadi and S. Oommen, Biotransformation of progesterone by thermophilic bacteria, AAAS Annual Meeting, Denver, Feb 13-18, 2003, Abstract # 159.

34. M. Afzal, Sameera Al-Awadi and S. Oommen, *Bacillus stearothermophilus* mediated transformation of androst-4-ene-17-ol-3-one (Testosterone), to a novel 9,10-seco-androst-4-ene-3,9,17-trione and other metabolites, AAAs Annual Meeting at Seattle, WA, Feb. 12-16, 2004, p-A104.

35. M.S.I. Dhami, M. Menon and M. Afzal, Alchemy to Biotechnology: Role of Nutrition, The Association of Academies of Sciences in Asia (AASA) June 9-13, 2004, at Anatoly, Turkey.
https://www.google.com/search?safe=active&rlz=1C5CHFA_enUS906US906&sxsrf=ALeKk01bDuNeGJdJH6VoFqJJivLIkDHfzg:1612716190508&source=univ

&tbm=isch&q=association+of+Academies+of+Sciences+in+Asia+2004&sa=X&ved=2ahUKEwiWhKL9m9juAhUNHc0KHfOJD6cQjJkEegQIERAB&biw=1868&bih=1056

36. M. Afzal, Sameera Al-Awadi and S. Oommen, Bacillus stearothermophilus. Use of 1HNMR and ^{13}CNMR in Steroid Stereochemical Problems, 15th. International Society of Magnetic Resonance, Annual meeting, October 24-28, 2004, Jacksonville, Florida, USA.

37. M. Afzal, Abdul Majeed Safar and Shaima Al-Bloushi, Green tea polyphenols and their antioxidant activities, Fourth Conference of the International Coenzyme Q10 Association, Los Angeles, California, USA, April 14-17, 2005 pp82-83.

38. J. M. Al-Hassan, A. Ramadan, M. Thomson, M. Ali, M. Afzal, M. Abdel-Razek, Aspects of neurological action of preparations from the protenacious skin secretion of the Gulf catfish (*Arius bilineatus*. Val), XXXV International Congress of Physiological Sciences (Experimental Biology), March 31- April 5, 2005, San Diego CA, Abstract # LB756, P161.

39. J. M. Al-Hassan, A. Ramadan, M. Thomson, M. Ali, M. Afzal, M. Abdel-Razek and R. Khan, Novel action of the preparations from the skin of the Arabian Gulf catfish (*Arius bilineatus* val.) on back pain and other neurological problems, Congress on Interdisciplinary neurological aspects, December 17-20, 2005, Kuwait.

40. M. Afzal, Sameera Al-Awadi and S. Oommen, Chromatographic profiling of microbial transformation of steroids, 5th. Annual Metabolic Profiling Conference, Orlando, FL, Dec. 7-9, 2005.

41. Jassim M. Al-Hassan, Abbas Ramadan, Martha Thomson, Muslim Ali, Mohammad Afzal, Mamdouh Abdel- Razek, and Reyadh Khan. Healing of Back Pain and Some other Neurological Problems Using Preparations from the Skin of the Arabian Gulf Catfish (Arius Bilineatus Val.). Experimental Biology 2006, Annual Meeting (American Society for Biochemistry and Molecular Biology), Abstract No. 330.8, PA487, 2006.

42. M. Afzal, Abdul Majeed Safar and Shaima Al-Bloushi, Synergistic effect of green tea polyphenols with CoQ9 in rats, 3rd. International conference on polyphenols applications in nutrition and health, Malta, Oct. 26-27, 2006.

43. A. M. Safar, M. Afzal, and S. Al-Bloushi, Effect of green tea extract on modulation of reserpine toxicity in animal model electron microscopy and bioanalytical studies. International conference on "Free Radicals in Biosystems", Kuwait March 18-21, 2007.

44. M. Afzal, A. M. Safar and S. Al-Bloushi Green Tea Polyphenols and their Antioxidant Activities, International conference on "Free Radicals in Biosystems", Kuwait March 18-21, 2007.

45. S. Al-Bloushi, M. Afzal, A. M. Safar, Synergistic effect of green tea polyphenols with CoQ9 in rats, International conference on "Free Radicals in Biosystems", Kuwait March 18-21, 2007.

46. A. M. Safer, M. Afzal, S. Al-Bloushi, M. Rafiq, Evaluation of green tea minerals by elemental X-ray microanalysis, International conference on "Free Radicals in Biosystems", Kuwait March 18-21, 2007.

47. Hana'a Abu-Rizk, M. Hisham Mansour and M. Afzal, Protective role of curcum in CCl_4-induced oxidative stress on liver and T-lymphocyte subpopulations in Wister rats, International conference on "Free Radicals in Biosystems", Kuwait March 18-21, 2007.

48. Amar Habib, Esmaeil Saleh and M. Afzal, Antioxidant and anti-MRSA activities of red grape seeds, International conference on "Free Radicals in Biosystems", Kuwait March 18-21, 2007.

49. M. Afzal, S. Al-Awadi, & S. Oommen, Antioxidant activity of biotransformed sex hormones facilitated by *Bacillus stearothermophilus*, British Society of Endocrinology (BES) Annual Meeting in Harrogate, UK, April, 2008 pp299.

50. M. S. Montasser, F. D. Al-Own, M. Afzal, TYLCV influences biomolecules in plant tissues, Experimental Biology, April 18-22, 2009, New Orleans, Louisiana, USA.

51. M. Afzal, S. Al-Awadi, S. Al-Tamimi and S. Oommen, Biotransformation of testosterone and progesterone by thermophilic *Geobacillus kaustophilus*. Annual Biotransformation Meeting in Cambria University, UK, May 22-25- 2009

52. S. Al-Bloushi, M. A. Safer and M. Afzal, Green tea modulates reserpine toxicity in animal model. Annual poster session, Faculty of Science, Kuwait University, May 3-6, 2009.

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