

Emeritus Professor

Gopalakrishnakone P

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RESEARCH INTERESTS

- To understand the mechanism/s of actions of venoms and toxins from Snakes, Scorpions, Spiders and other venomous marine creatures.
- Structures of venom secreting apparatus and the mechanism/s of venom secretion in various venomous animals.
- Muscle structure, muscle pathology, venom and toxin induced muscle damage Myoglobinuria, Renal lesions following myoglobinuria.
- Animal models for muscle diseases and Renal lesions.
- Identification and Characterization of channel Toxins.
- Immunology and cloning of toxins, Naturallyoccurring antitoxic factors.
- Use of IT in teaching Medical and Dental students.
- Microarray technology for proteomics and genomics.
- Biosensors for biomedical applications.

CURRENT PROJECTS

- Anti-inflammatory peptide loaded microemulsion gel formulation as potential therapeutic for post operative adhesions.
- Evaluation of a skin patch functionalized with anti-inflammatory peptide embedded micro-emulsion carrier for arthritis treatment.
- Small and Taste communication(Collaborative project with IDMI &Neurosensory Initiative).
- Assessment of Bio-Toxins by Optical Immunoassay(Collaboration with DSO&DMERI).
- Evaluation and screening of scorpion sodium channel toxins for potential anti – tumour activity

AREAS OF COLLABORATIVE RESEARCH

- Overseas current collaboration with Mount Sinai School of Medicine,New York and Alexander Fleming Institute,Athens,Greece

SELECTED PUBLICATIONS

- Gong J.P, R.M. Kini, M.C.E. Gwee, Gopalakrishnakone P and MCM Chung Makatoxin I, a novel toxin isolated from the venom of the scorpion, Buthusmartenseikarsh, exhibit nitrenergic action. Journal of Biological Chemistry, 272,13 (1997), 8320-8370

- Balaji, R.A, A. Ohtake, K, Sato, Gopalakrishnakone P, R.M, Kini, K.T Seow and B.H. Bay. Lambda - Contoxius, a new family of canotoxins with unique disulfide patterns and protein folding. Isolation and characterization from the venom of *Conus marmoratus*. *Journal of Biological Chemistry*, 275(50)(Dec 2000), 39516-39522
- Srinivasan KN, Sivaraja V, Huys I, Sasaki T, Cheng B, Kumar TK, Sato K, Tytgat J, Yu C, San BC, Ranganathan S, Bowie HJ, Kini RM, Gopalakrishnakone P. kappa-Hefutoxin1, a novel toxin from the scorpion *Heterometrus fulvipes* with unique structure and function. Importance of the functional diad in potassium channel selectivity. *J Biol Chem*. 2002 Aug 16;277(33):30040-7.
- Nirthanan S, Charpentier E, Gopalakrishnakone P, Gwee MC, Khoo HE, Cheah LS, Bertrand D, Kini RM. Candoxin, a novel toxin from *Bungarus candidus*, is a reversible antagonist of muscle (alpha-bungarotoxin) but a poorly reversible antagonist of neuronal alpha 7 nicotinic acetylcholine receptors. *J Biol Chem*. 2002 May 17;277(20):17811-20.
- Thwin MM, Douni E, Aidinis V, Kollias G, Kodama K, Sato K, Satish RL, Mahendran R, Gopalakrishnakone P. Effect of phospholipase A2 inhibitory peptide on inflammatory arthritis in a TNF transgenic mouse model: a time-course ultrastructural study. *Arthritis Res Ther*. 2004;6(3):R282-94. Epub 2004 Apr 28.
- Dong le V, Eng KH, Quyen le K, Gopalakrishnakone P. Optical immunoassay for snake venom detection. *Biosens Bioelectron*. 2004 May 15;19(10):1285-94.
- Raghavendra Prasad HS, Qi Z, Srinivasan KN, Gopalakrishnakone P. Potential effects of tetrodotoxin exposure to human glial cells postulated using microarray approach. *Toxicon*. 2004 Nov;44(6):597-608.
- Gao R, Manjunatha Kini R, Gopalakrishnakone P. A novel prothrombin activator from the venom of *Micropechis kaheka*: isolation and characterization. *Arch Biochem Biophys*. 2002 Dec 1;408(1):87-92
- Gwee MC, Nirthanan S, Khoo HE, Gopalakrishnakone P, Kini RM, Cheah LS. Autonomic effects of some scorpion venoms and toxins. *Clin Exp Pharmacol Physiol*. 2002 Sep;29(9):795-801.
- Selvanayagam ZE, Neuzil P, Gopalakrishnakone P, Sridhar U, Singh M, Ho LC. An ISFET-based immunosensor for the detection of beta-Bungarotoxin. *Biosens Bioelectron*. 2002 Sep;17(9):821-6.
- Nirthanan S, Gao R, Gopalakrishnakone P, Gwee MC, Khoo HE, Cheah LS, Manjunatha Kini R. Pharmacological characterization of mikatoxin, an alpha-neurotoxin isolated from the venom of the New-Guinean small-eyed snake *Micropechis kaheka*. *Toxicon*. 2002 Jul;40(7):863-71
- Dong le V, Selvanayagam ZE, Gopalakrishnakone P, Eng KH. A new avidin-biotin optical immunoassay for the detection of beta-bungarotoxin and application in diagnosis of experimental snake envenomation. *J Immunol Methods*. 2002 Feb 1;260(1-2):125-36. PMID: 11792383

- Thwin MM, Satish RL, Chan ST, Gopalakrishnakone P. Functional site of endogenous phospholipase A2 inhibitor from python serum. *Eur J Biochem.* 2002 Jan;269(2):719-27.
- Srinivasan KN, Gopalakrishnakone P, Tan PT, Chew KC, Cheng B, Kini RM, Koh JL, Seah SH, Brusica V. SCORPION, a molecular database of scorpion toxins. *Toxicon.* 2002 Jan;40(1):23-31. Review.
- Nirthanan S, Joseph JS, Gopalakrishnakone P, Khoo HE, Cheah LS, Gwee MC. Biochemical and pharmacological characterization of the venom of the black scorpion *Heterometrus spinifer*. *Biochem Pharmacol.* 2002 Jan 1;63(1):49-55.

HONOURS & AWARDS

- Commonwealth Medical Scholarships (3 years in U.K.) - 1976-1979.
- World Health Organisation Fellowships (3 times each 2-3 months).
- Visiting Research Scientist, Institute of Neurology, Queen Square, London, U.K.
- Research Scholar, W.H.O. Collaborative Centre for Venoms and Antivenoms, Liverpool, U.K.
- Research Scholar, Queen Elizabeth College, University of London, U.K.
- British Council Award and Sabbatical leave by N.U.S.
- Visiting Scholar - National Poison Centre, Guy's Hospital, U.K. and University of Delaware, USA.
- Outstanding University Researcher Award (National University of Singapore) - 1998.
- NSTB 2000, Science And Technology Award, Ministerial Citation Winner
- Research Excellence Award, Faculty of Medicine, AY 2002/2003
- Teaching excellence Award, Faculty of medicine, AY 2003/2004
- Excellent teacher Award, NUS, AY 2003/2004
- DSO National Lab Group Performance Award. 2004
- Prof Gopalakrishnakone--Supervisor of Dr A. Balaji and Dr Nirthanan who are the winners of "Chua Toh Hua Memorial Gold Medal Award" for the Doctor of Philosophy Graduate with the most outstanding work done in life sciences for Year 2002 and Year 2003 respectively.
- Prof Gopalakrishnakone's Group awarded a US Patent on Methods and Compositions treatment of arthritis and cancer.
- Annual Teaching Excellence Award - Certificate and University Awards 2010
- Prof Gopal's research is featured in, International innovations International Innovation is the leading global dissemination resource for the wider scientific, technology and research communities, dedicated to disseminating the latest science, research and technological innovations on a global level. More information and a complimentary subscription offer to the publication can be found at: <http://www.researchmedia.eu/>
- Prof Gopal has been awarded the Emeritus Professorship from July 2014

- Prof Gopal celebrated the 30years of establishment of Asia Pacific Section of International Society on Toxinology during the 10th AP-IST meeting in Changsha(June 2014) as the founder President of AP-IST as well as the Immediate Past President of International Society on Toxinology
- Prof Gopal receives "Life Time Achievement Award" from the President of Toxinology Society of India.
- Prof Gopal was awarded a certificate of recognition by the President of the Vietnam Medical Association for his dedicated contribution to medical education and research and the development of medical associations in Vietnam.
- Prof Gopal receives a certificate of merit from the President of Vietnam Society on Toxinology for his Life Long Achievement and contribution to toxicology in Vietnam.

OTHER APPOINTMENTS

- Chairman of the Multidisciplinary Research Group on Venom and Toxin Research, National University of Singapore (1986-).
- Chairman of the First Asia-Pacific Congress on Animal, Plant and Microbial Toxins 1987.
- Chairman of the 10th World Congress on Animal, Plant and Microbial Toxins 3-8 November 1991, N.U.S., Singapore.
- President of the International Society on Toxinology (Asia-Pacific) 1987-1991.
- Council Member of the international Society on Toxinology,(1987-).
- World Health Organization Consultant on Snakebite and Treatment in Developing Countries (Temporary) 1981.
- Treasurer - Asia-Pacific Society on Medical Toxicology (1989-1992).
- Member - Steering Committee, National Poison Control Centre (I 989-1991), Singapore.
- Member-Advisory Committee, National Poison Centre(1989-) Singapore
- Co-ordinator for Multidisciplinary Research in Faculty of Medicine (1 989), National University of Singapore.
- Member - Working Group on Natural Toxins, World Health Organization, (I 988-), I.P.C.S.
- Chairman of the World Health Organization - International Programme on Chemical Safety. Meeting of the Working Group of Experts on Natural Toxins - 1989.
- Chairman of the World Health Organization - International Programme on Chemical Safety. Meeting of the Working Group of Experts on Natural Toxins - 1991.
- Member of the Editorial Board - (A) TOXICON (S) Micromedex.
- Consultant, Poison Information Centre, I.S.F.M., Ministry of Health, (1991-).
- Research Fellow. Bioscience Centre. National University of Singapore (1995-).

- Principal Adjunct Research Fellow at Defence Medical Research Institute, MINDEF (1996 -).
- Consultant-Defence Science Organization National Laboratories,(1998-).
- Founder member of Biosensor focused Interest Group. (1998-).
- President of International Society on Toxinology till 2012
- Prof. Gopal assumes the position of “Professor of Health and Social Sciences” at the Singapore Technology Institute (Newest University in Singapore) from May 2016 while he holds the position of Emeritus Professor in Department of Anatomy, YLL School of Medicine, NUS, National University Health System (NUHS).

OTHER NEWS

- National Research Foundation
- Prof Gopal, President of the International Society on Toxinology opens the World Congress on Animals ,Plants and Microbial Toxins In Hawaii in July 2012
- Prof Gopal's appointment as Adjunct Principal Research Fellow in DMERI@DSO has been extended till 31st Oct 2015 after being in this position for the last 10years.The certificate was presented by Minister for Defence Dr Ng Eng Hen