

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME KALAI MATHEE	POSITION TITLE PROFESSOR
MATHEEK	

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

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
University of Malaya, Kuala Lumpur, Malaysia	BSc	1984	Genetics
University of Malaya, Kuala Lumpur, Malaysia	MSc	1986	Molecular Genetics
Univ. of Tennessee Health Sc Ctr at Memphis	PhD	1992	Microbiol & Immunol
Tufts University, Boston	Postdoc	1992	<i>H. pylori</i> Pathogenesis
Univ. of Tennessee Health Sc Ctr at Memphis	Postdoc	1993	<i>P. aeruginosa</i> Pathogenesis "alginate biology"

A. Personal Statement

With little over 20 years of experience, the major focus of my research has been to better understand microbial infections in patients with cystic fibrosis (CF). The long-term goal is to contribute to the understanding of the pathobiology of intractable *Pseudomonas aeruginosa* chronic infections. The focus of my research is molecular pathology of *P. aeruginosa*, with specific emphasis on β -lactam resistance, alginate overproduction, comparative genomics, alternative therapies, CF lung ecology, bioinformatics and nanotechnology. Besides doing a postdoctoral fellowship with Dennis Ohman (the alginate consummate), I spent considerable time with Soren Molin (biofilm) and Niels Hoiby (CF microbiology) in Denmark and held Danish Research Council grant as a Co-PI. With no prior training in the area of antibiotic resistance, in 2000 as an Assistant Professor, I decided to focus my research on β -lactam resistance, in particular the *amp* pathway. This was prompted by the fact there was little or no information on *P. aeruginosa amp* system (two 1985 publications in a heterologous system). I was able to incorporate state of the art techniques – **microarray, Proteome, CHIP, ChIPSeq and RNASeq** in my efforts to better understand *P. aeruginosa* pathogenesis, particularly the role of AmpR. Though it took us considerable time to develop the tools, but has led to many discoveries such as: (i) identification of a second chromosomally encoded β -lactamase PoxB, (ii) demonstration of the global role in virulence played by the transcriptional regulator AmpR (iii) identification of a second permease, AmpP, and demonstrating both AmpG and AmpP are essential for β -lactamase expression, (iv) coregulation of two phenotypes associated with chronic infection, alginate production and antibiotic resistance, via AmpR, and (v) demonstration that AmpR plays a major role in the transient development of resistance to unrelated antibiotics when exposed to sub-inhibitory concentrations of any antibiotics. In 2006-2007, I did a sabbatical with Prof. Stephen Lory, an internationally recognized expert on *P. aeruginosa* in Harvard Medical School. My work on **comparative genomics** resulted in 2008 PNAS paper that was selected by Faculty 1000. We continue to collaborate at many fronts, and my recent graduate student has joined him as a postdoctoral fellow.

B. Position and Honors

Positions and Employment

Sum 97, 98, 99, 2000	Visiting Scientist Department of Microbiology, Technical University of Denmark, Lyngby & Department of Clinical Microbiology, University Hospital, Copenhagen, Denmark
1999 – 2005	Assistant Professor, Department of Biological Sciences, CAS, Florida International

	University (FIU), Miami, FL
1999 – 2005	Research Adjunct Faculty, Department of Clinical Microbiology, University Hospital, Department of Clinical Microbiology, University Hospital, Copenhagen, Denmark
2006 – 2007	Visiting Associate Professor, Department of Microbiology and Molecular Genetics, Harvard Medical School, Boston, MA
2005 – 2008	Associate Professor, Department of Biological Sciences, CAS, FIU, Miami, FL
2001 –	Affiliate Faculty International Forensic Research Institute, FIU, Miami, FL
2007 – 2010	Associate Professor, Department of Molecular Microbiology & Infectious Diseases, Herbert Wertheim College of Medicine, FIU, Miami, FL
2007 – 2013	Founding Chair, Department of Molecular Microbiology & Infectious Diseases, Herbert Wertheim College of Medicine, FIU, Miami, FL
2010 – 2013	Professor of Molecular Microbiology & Infectious Diseases, Herbert Wertheim College of Medicine, FIU, Miami, FL
2011 Winter	Visiting Professor, Department of Microbiology and Molecular Genetics, Harvard Medical School, Boston, MA
9/2013 –	Professor of Molecular and Human Genetics, Assistant Dean of Student Affairs, Herbert Wertheim College of Medicine, FIU, Miami, FL
3/2014 – 9/2014	Sabbatical Visitor <ul style="list-style-type: none"> ▪ Pan American Health Organization, World Health Organization, Washington, DC ▪ Sabin Vaccine Institute, Washington, DC

Honors (excluded invited lectures)

2000	President Elect Task Force Meeting” I was one of the ~40 members selected by Prof. Martha Howe, the 101st ASM President, to attend the task force meeting at the 100th Annual Meeting of the American Society for Microbiology in May 2000
2000	Ranjit Bhagwan Singh Fellowship from the Academy of Sciences Malaysia to conduct a workshop on “Bacteria Cell-to-Cell Communication” under the program of The Dr. Ranjit Bhagwan Singh Medical Research Fund
2001 -	Scientific Organizing Committee, Asian Conference on Transcription
2002	Scientific Organizing Chair, Seventh Asian Conference on Transcription, Kuala Lumpur, Malaysia
2002	I was invited to attend an exclusive meeting on “Phage therapy – Potential and Challenges” held at The Banbury Center, Cold Spring harbor Laboratory, 13-15 November 2002
2003	ZIA Symposium Scholarship to participate at their 2003 Symposium on Research Careers in Bioinformatics
2003	Appointed as a member of American Society for Microbiology Committee on Personnel Planning for the period of 7/03 to 6/06
2004	FIU – Excellence in Research Award
2004	Featured in “Faculty Profiles”, Fall 2004 FIU Magazine
2005	Second Annual McNair Post Baccalaureate Achievement Program 2005 Summer Research Institute Closing Ceremony, FIU. <i>How does one measure the success of the McNair Program?</i>
2007	Day 25th of “The FIU World-Class Campaign” that showcased the quality and excellence in FIU in the Miami Herald in a 30-day series of full-page advertisements
2007	Delivered the Faculty Invocation at the 2007 Faculty Convocation at FIU, October 5th, Miami, FL
2007	First Founding Faculty to be recruited by Herbert Wertheim College of Medicine, FIU
2008	American Society for Microbiology Travel Award to India (deferred to a later date)
2008	Beauty and the Best Award for Outstanding Contributions to the Community and Cystic Fibrosis Foundation, South Florida Cystic Fibrosis Foundation
2009 -	Associate Editor, BMC Microbiology
2009 -	Associate Editor, Journal Medical Microbiology (Society for General Microbiology Journal)
2009 -	Editorial Board, Frontiers in Microbiology
2010	Member, Board of Advisors, International Forensic Science Research Program, College of Arts

	and Sciences, Florida International University
2010	Finalist, FIU President's Council Outstanding Faculty Award in recognition of sustained excellence in Teaching, Research and Service
2011	Invited to deliver the "Occasion" for the 20 th Reverend Martin Luther King Jr Breakfast attended by over 500 people
2011	Honored as the "Mother of the Class" by the Elite Class of 2011, A.M. Dogglioti Medical College, University of Liberia
2011-2014	Organizing Chair, International Conference on Tropical Medicine, HWCAM, FIU, Miami, FL
2011	FIU – Faculty Award for Excellence in Mentorship
2011	FIU President's Council Worlds Ahead Faculty Award in recognition of outstanding achievement as a student-centered professor who makes an impact and exceeds expectations – Highest honor in FIU
2012	FIU – Program in the Study of Spirituality Civic Engagement Award
2013	Member of Organizing Committee, a two-day session on <i>Pseudomonas</i> at the annual SGM Conference in Liverpool, UK

C. Selected Peer-reviewed Publications (Total 78 publications and 66 are peer reviewed)

A: Relevant Publications		
1	2005	K.F. Kong, S.R. Jayawardena, S. D. Indulkar, A. del Puerto, C-L. Koh, N. Høiby, and K. Mathee . <i>Pseudomonas aeruginosa</i> AmpR is a global transcriptional factor that regulates expression of AmpC and PoxB β -lactamases, proteases, quorum sensing and other virulence factors. <i>Antimicrobial Agents and Chemotherapy</i> 49:4567-75. [PMID: 16251297; PMCID: PMC1280116]. <i>Article selected for Journal Highlights in the ASM News December issue. A monthly issue that highlights one article per journal that describes new and exciting developments in microbial research.</i>
2	2008	A. Adonizio, S. Leal, F. Ausubel, and K. Mathee . Attenuation of <i>Pseudomonas aeruginosa</i> virulence by medicinal plants in a <i>Caenorhabditis elegans</i> model system. <i>Journal of Medical Microbiology</i> 57:809-813. [PMID: 18566137; PMCID: PMC3081088]. <i>One of the compounds resulted in a patent application.</i>
3	2008	K. Mathee , G. Narasimhan, C. Valdes, X. Qiu, J. M. Matewish, M. Koehrsen, A. Rokas, C. N. Yandava, R. Engels, E. Zeng, R. Olavarietta, M. Doud, R. Smith, P. Montgomery, J. White, P. A. Godfrey, C. Kodira, B. Birren, J. Galagan and S. Lory. Dynamics of <i>Pseudomonas aeruginosa</i> genome evolution. <i>Proceedings of National Academy of Sciences USA</i> 105(8):3100-3105. [PMID: 18287045; PMCID: PMC2268591]. <i>Highlighted by Genome Technology Online, Feb 20, 2008, "Survival through genome shapeshifting" and Selected for review by Faculty of 1000 Biology.</i>
4	2009	D. Balasubramanian, and K. Mathee . Comparative transcriptome analyses of <i>Pseudomonas aeruginosa</i> . <i>Human Genomics</i> 3(4):349-61. [PMID:19706365]
5	2010	K.F. Kong, A. Aguila, L. Schneper, and K. Mathee . <i>Pseudomonas aeruginosa</i> β -lactamase induction requires two permeases, AmpG and AmpP. <i>BMC Microbiology</i> 10:328-343. [PMID: 21192796; PMCID: PMC3022710]
6	2011	D. Balasubramanian, K.F. Kong, S. Jayawardena, S. Leal, R. Sautter, and K. Mathee . Coregulation of β -lactam resistance, alginate production, and quorum sensing in <i>Pseudomonas aeruginosa</i> . <i>Journal of Medical Microbiology</i> 60(2):147-156. [PMID: 20965918; PMCID: PMC3081088]. <i>Featured in MDLinx web site (www.MDLinx.com). MDLinx is the world's most up-to-date index of articles that matter in the daily lives of physicians and other healthcare professionals.</i>
7	2012	D. Balasubramanian, L. Schneper, M. Merighi, R. Smith, G. Narasimhan, S. Lory, and K. Mathee . The regulatory repertoire of <i>Pseudomonas aeruginosa</i> AmpC β -lactamase regulator AmpR includes virulence genes. <i>PLoS One</i> 2012;7(3):e34067. [PMID: 22479525; PMCID: PMC3315558].
8	2013	D. Balasubramanian, L. Schneper, H. Kumari and K. Mathee . A dynamic and intricate

		regulatory network determines <i>Pseudomonas aeruginosa</i> virulence. <i>Nucleic Acids Research</i> 41:1-20. [PMID:23143271; PMCID: PMC3592444]
9	2014	D. Balasubramanian, H. Kumari, M. Jaric, M. Fernandez, K.H. Turner, S.L. Dove, G. Narasimhan, S. Lory and K. Mathee . Deep sequencing analyses expands the <i>Pseudomonas aeruginosa</i> AmpR regulon to include small RNA-mediated regulation of iron acquisition, heat-shock and the oxidative stress response. <i>Nucleic Acids Research</i> 42(2):979-98. [PMID: 24157832; PMCID: PMC3902932]
10	2014	H. Kumari*, S.K. Murugapiran*, D. Balasubramanian, L. Schneper, M. Merighi, D. Sarracino, S. Lory, and K. Mathee . LTQ-XL mass spectrometry proteome analysis expands the <i>Pseudomonas aeruginosa</i> AmpR regulon to include cyclic di-GMP phosphodiesterases and phosphoproteins, and identifies novel open reading frames. <i>Journal of Proteome Research</i> ; 96:328-42. (* - <i>contributed equally</i>) [PMID:24291602]
B: Important Publications		
11	1998	K. Hughes, and K. Mathee . The anti-sigma factors. <i>Annual Review of Microbiology</i> 52:231-286. [PMID: 9891799].
12	2000	S. Malhotra, L.A. Silo-Suh, K. Mathee , and D.E. Ohman. Proteome analysis of the effect of mucoid conversion on global protein expression in <i>Pseudomonas aeruginosa</i> strain PAO1 shows induction of disulfide bond isomerase, DsbA. <i>Journal of Bacteriology</i> 182:6999-7006. [PMID: 11092861; PMCID: PMC94826].
13	2010	K. F. Kong, L. Schneper, and K. Mathee . Beta-lactam antibiotics: from antibiosis to resistance and bacteriology. Review. <i>Acta Pathologica, Microbiologica, et Immunologica Scandinavica</i> 118(1):1-36. [PMID: 20041868; PMCID: PMC2894812 ; NIHMSID: NIHMS156704]. <i>Quoted as a must-read</i> .
14	2011	V.L.A. Malladi, A.J. Sobczak, N. Maricic, S.K. Murugapiran, L. Schneper, J. Makemson, K. Mathee * and S.F. Wnuk *. Substituted lactam and cyclic azahemiacetals modulate <i>Pseudomonas aeruginosa</i> quorum sensing. <i>BMC Bioorganic and Medicinal Chemistry</i> . 19:5500-5506. [PMID: 21855349 PMCID: PMC3171587] [<i>*Co-corresponding author</i>] – <i>resulted in a patent of novel compounds</i>
15	2014	H. Kumari, D. Balasubramanian, and K. Mathee . <i>Pseudomonas aeruginosa</i> AmpR plays a role in transient cross-resistance to β -lactams and non- β -lactams upon preexposure to subinhibitory concentrations of antibiotics. <i>Journal of Medical Microbiology</i> 63: 544-55 [PMID: 24464693; PMCID: PMC3973449] <i>Featured in MDLinx web site (www.MDLinx.com)</i> .

D. Research Support

A: Current Research Support			
1	NSF NSF AIR-CREST-I/UCRC-Industry Ecosystem to Pipeline	Mathee (CoPI); Rishe (PI)	09/2012- 06/2014
2	Alpha1 Foundation The airway microbiome in patients with alpha-1 trypsin deficiency	Mathee (CoPI); Campos (PI)	09/2014 – 08/2015
B: Completed Research Support in last three years			
1	James and Esther King Program RC1 The Airway Microbiome in COPD	Mathee (CoPI); Wanner (PI)	01/2010-09/2012
2	NIH/NIGMS MBRS SC1 Regulation of <i>P. aeruginosa</i> PoxB oxacillinase by AmpR and a two-component system	Mathee (PI)	08/2008-07/2013 1SC1AI081376-01