

VANAJA KUMAR
SCIENTIST F



Date of Birth: 19-03-1951

Date of Joining Present Post: 1st July 2006

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Educational Qualification:

- Ph.D Annamalai University (1979)
- M.Sc Madras University (1973)
- B.Sc. Madras University (1970)

Discipline:

MICROBIOLOGY

Research Experience:

Field of specialization:

- Isolation and identification of mycobacteria from clinical samples.
- Luciferase reporter assay optimization and phagebiotics
- Phage biology and genomics
- Anti TB compounds from actinomycetes of marine and extreme environments
- Screening lead compounds from plant extracts

Membership/Fellowship of Professional Societies/Associations :

Luminescence Society Of India

Member of Association of Microbiologists of India.

Workshops/Conferences/Symposiums :

1. International symposium on "Current developments in drug discovery for TB" from 14th to 17th January, 2002, organized by Astra Zeneca, Bangalore and held at IISC Campus, Bangalore.
2. Workshop on Scientific writing conducted from 1-4 March, 2002 at Tuberculosis Research Centre, Chennai.
3. Indo-French symposium on "Tuberculosis and AIDS" from 7th to 9th March, 2002 held at Hotel Radha Park Inn, Chennai.
4. PATESTATE- Patent Information for Drug Research, workshop conducted from 11-12th September, 2002 at URDIP, Pune.
5. Refresher Course for Professors/ Assistant Professors of Madras University at University of Madras, Guindy campus, Chennai on 9th September, 2003. **Title of the talk:** Molecular methods in diagnosis and drug sensitivity testing of *M.tuberculosis*.
6. Seminar on Recent trends in Medical Technology organized by Dept of Microbiology, Sri Sankara Arts College, Kancheepuram on 30th December, 2003. **Title of the talk:** Phage based assays and molecular methods in TB diagnosis and drug sensitivity testing.
7. Attended 104th General meeting of American Society for Microbiology (ASM) meeting during May 23-27, 2004 at New Orleans, **Lousiana, USA**.
8. AIDS in India: A Regional Symposium-Workshop on Research Trials and Treatment from July 31st to August 6th, 2004. Title of the talk: New mycobacteriophage constructs to improve the sensitivity of LRP assay for TB diagnosis in AIDS patients.
9. National science congress/Children Science Congress held at Ahmedabad from 3rd to 7th January 2005 at Nirma University, Ahmedabad. Participated as facilitator in ICMR stall at Pride of India Expo on behalf of TRC.
10. National Conference on Luminescence Applications (NCLA 2005) held at Bangalore University Campus from 2-4th Feb. 2005. Invited talk titled "Bioluminescence as a molecular tool" presented.

11. Participated in WHO sponsored “Regional Consultation on Expanding Laboratory Services for TB control” at Tuberculosis Research Centre, Chennai, 11-13 July, 2006.
12. Chaired an oral presentation session in 5th National conference of Indian Association of Applied Microbiologists on “Emerging Trends and Evolving Technologies in Applied Microbiology with Special Reference to Microbial Nanotechnology” organized by Sri Sankara Arts and Science College, Kanchipuram, 11-12 January 2007.
13. Organised a symposium on “Newer antituberculosis drugs: antibiotics from untapped sources and from synthesized compounds” and delivered guest lecture on “XDR-TB: the need for new anti tuberculosis drugs” during a one day conference and CME program jointly conducted by the L&T Microbiology Research Centre, Vision Research Foundation, Sankara Nethralaya, Chennai and Indian Association of Medical Microbiologists, on 24th February, 2007.
14. Organized hands on training and gave an introductory lecture on phage based assays in “Aids in India – 2007” jointly organized by AECOM, New York, USA, AITRP, USA, and JNCASR, Bangalore, 8-13 July 2007.
15. Participated in “Consultative meeting – India response plan for the diagnosis and management of MDR/XDR TB in Chennai”, organized by Tuberculosis Research Centre, Chennai, September 14-15, 2007.
16. Participated and delivered a lecture in the conference “Glacial overview of tuberculosis” held at St. James college, Chalakudi on 20-21 March 2009.
17. Participated in workshop on preparation of SOP’s on Culture and DST testing for IRL on 6th November 2009 at NTI, Bangalore.
18. Research dissemination workshop on 15-16 December 2009 organized by WHO and TRC.
19. Participated in APCON 2009. Drug susceptibility testing-Past, Present and Future. December 22-23 2009.
20. Participated and presented a paper on “Mycobacteriophages-a journey to the unknown” in IAAM conference at SRM college on 11th December 2009.

21. Participated and chaired a session in AP chapter of IAMM held at Tirupati on February 6th 2010.
22. Participated in a symposium on Best practices in Mycobacteriology held at TRC, Chennai on 30th March 2010 organized by Becton Dickinson.
23. Participated and delivered guest lecture in National Symposium on Molecular Diagnosis of Communicable Diseases organized by Adhiparasakthi College of Arts and Science, Kalavai on 11th October 2010.
24. Participated and delivered guest lecture in National Seminar on Recent Trends in Microbial Technology with Reference to Extremophiles organized by Periyar University, Salem from 21st to 22nd October 2010.
25. Organised a National Symposium on “Antituberculosis Drug Discovery: Current Status and Future prospects” at Tuberculosis Research Centre, Chennai on 30th October 2010.

Awards:

Life time achievement award” presented by Indian Association of Medical Microbiologists at SRM University on December 11th 2009.

Projects:

S. No	Title	Funding Agency	Role
1	Potential Tuberculosis Drugs from Marine Actinomycetes	Department of Science and Technology	Principle Investigator
2	Protocol development for “Sensitivity and Specificity of <i>Mycobacterium tuberculosis</i> Screening and Diagnostics in HIV-Infected Individuals Initiating or Re-Initiating Antiretroviral Therapy”	The National Institute of Allergy and Infectious Diseases (NIAID)	Core team member- Mycobacteriologist
3	Establishment of National data base for tuberculosis	Department of Biotechnology	Principle Investigator

Patents

S. No	Authors	Title	File No	Date of filing
1	Selvakumar N and Vanaja Kumar	Pot method for detection of acid fast bacilli	P&I / IPR / Com. Patents 143	December 2008
2	Vanaja Kumar, S. Balaji and N. Selvakumar	Sputum processing method for mycobacteria	2819/DEL/2008	11/12/2009
3	Vanaja Kumar, Azger Dusthacker, N. S. Gomathi and S. Balaji	Improved luciferase reporter phage assay for rapid detection of dormant and active tubercle bacilli from clinical samples	2530/DEL/2010	22/10/2010
4	Vanaja Kumar, Mukesh Doble, R. Balagurunathan, G. Suresh, M. Radhakrishnan, N. Selvakumar, Luke Elizabeth Hanna and Sowmya Swaminathan	New antituberculous antibiotic from marine actinomycetes strain R2	P&I/IPR/TRC/184	16/06/2010

List of Publications

1. Manavalan S, Devendran K, **Vanaja kumar** and Selvakumar N. **1977**. *Vibrio oarahaemolvticus* in the marine environment at Porto Novo. **Current Science**.; 46: 821.
2. **Vanaja kumar**. **1979**. Antagonistic actinomycetes associated with molluscs of Porto Novo region. **Ph. D. Thesis**. Annamalai Univeristy. Tamil Nadu, India.
3. **Vanaja Kumar**. **1986**. A controlled clinical trial of 3 and 5 month regimens in treatment of sputum- positive pulmonary tuberculosis in South India, Tuberculosis Research Centre and national Tuberculosis Institute. Bangalore. American Review of Respiratory Diseases. 134: 27.
4. Selvakumar N, **Vanaja Kumar**, Paramasivan CN, Prabhakar R. **1987**. Mycobacteriocin typing of mycobacteria isolated in patients from South India, Hong Kong and Britan. **Indian Journal of Medical Research**. 86: 162.
5. Paramasivan CN, **Vanaja Kumar** Alexander C, Venkatesan P, Somasundaram PR and Prabhakar R. **1987**. Use of multiple media for the cultivation of mycobacteria from specimens other than sputum. **Indian Journal of Medical Research**. 86: 290.
6. Jawahar MS, Sivasubramaniam S, Vijayan VK, Ramakrishnan CV, Paramasivan CN, **Vanaja Kumar**, Tripathy SP and Prabhakar R. **1990**. Short Course Chemotherapy for tuberculous lymphadenitis in children. **British Medical Journal**. 301: 359.
7. Selvakumar N, **Vanaja Kumar**, Duraipandian M, Thilothammal N and Prabhakar R. **1991**. Cerebrospinal fluid Adenosine Deaminase and Lysozyme levels in the diaghosis of tuberculous meningitis CTBM). **Indian Journal of Tuberculosis**. 38: 217.
8. Selvakumar N, **Vanaja Kumar**, Acharyulu GS, Fathima Rehman, Paramasivan CN and Prabhakar R. **1992**. Susceptibility of South Indian strains of *M. tuberculosis* to Tuberactinomycin. **Indian Journal of Medical Research**. 95: 101-104.

9. Selvakumar N, **Vanaja Kumar**, Narayana ASL, Suryanarayanan D, Umopathy KC, Paramasivan CN and Prabhakar R. **1993**. Use of cetylpyridium chloride for storage of sputum specimens and isolation of *M. tuberculosis*. **Indian Journal of Tuberculosis**. 40:95.
10. Selvakumar N, Reetha AM, **Vanaja Kumar**, Tripathy SP, Sivasubramanian S, Paramasivan CN and Prabhakar R. **1994**. Mycobacteriuria in pulmonary tuberculosis patients in Madras, South India. **Indian Journal of Tuberculosis**. 41: 43-45.
11. Selvakumar N, **Vanaja Kumar** Gopi PG, Paramasivam CV, Manjula Dutta and Prabhakar R. **1995**. Isolation of *M. tuberculosis* from sputum samples of patients in the field studies by the cetylpyridinium chloride-sodium chloride and sodium hydroxide methods. **Indian Journal of Medical Research**. 102: 149-151.
12. Tuberculosis Research Centre, Madras. **1995**. Interim findings on the evaluation of split drug regimens for pulmonary tuberculosis - A randomised controlled clinical trial. **Indian Journal of Tuberculosis**. 42: 201-206.
13. Selvakumar N, **Vanaja Kumar**, Thilothammal N and Paramasivam CN. **1996**. Isolation of *Mycobacterium tuberculosis* from cerebrospinal fluid by the centrifugation and filtration methods. **Indian Journal of Medical Research**. 103: 250-252.
14. Tuberculosis Research Centre, Chennai. **1996**. Seven year findings of short course chemotherapy in 18 districts in India under District Tuberculosis Programme. **Indian Journal of Tuberculosis**. 43: 131-142.
15. **Vanaja Kumar**, Selvakumar N, Jawahar MS, Rajaram K and Paramasivan CN. **1997**. Transportation of lymphnode biopsy specimens in selective Kirchner's medium for culture of tubercle bacilli. **Journal of Medical Microbiology**. 46: 260- 262.
16. Selvakumar N, **Vanaja Kumar** and Paramasivam CN. **1997**. In vitro susceptibility of clinical isolates of *M. tuberculosis* to cefadroxil- a cephalosporin antibiotic. **Indian Journal of Medical Research**. 105: 58-60.

17. Selvakumar N, **Vanaja Kumar**, Krishnamurthy PV, Prabhakar R and Murthy PS. **1997**. In vitro susceptibility of *Mycobacterium tuberculosis* to trifluoperazine. **Current Science**. 73: 79-80.
18. **Vanaja Kumar**, Selvakumar N, Venkatesan P, Chandrasekaran V, Paramasivan CN and Prabhakar R. **1998**. Bioluminescence assay of ATP In drug susceptibility testing of *Mycobacterium tuberculosis*. **Indian Journal of Medical Research**. 107: 75-77.
19. Paul F.Riska, Ya Su, Svetoslav Bardarov, Laurence Freundlich, Gary Sarkis, Graham HatfuU, Christian Carriere, **Vanaja Kumar**, John Chan and William R Jacobs Jr. **1999**. Rapid film-based determination of antibiotic susceptibilities of *Mycobacterium tuberculosis* strains by using a luciferase reporter phage and the Bronx Box. **Journal of Clinical Microbiology**. 37: 1144-1149.
20. Ramanathan VD, Jawahar MS, Paramasivan CN, Rajaram K, Chandrasekar K, **Vanaja Kumar**, Palanimurugan K and Prabhakar R. **1999**. A histological spectrum of host responses in tuberculous lymphadenitis. **Indian Journal of Medical Research**. 109: 212-220.
21. Mani C, Selvakumar N, **Vanaja Kumar**, Sujatha Narayanan and Narayanan PR. **2003**. Comparison of DNA sequencing, PCR-SSCP, and PhaB assays with indirect sensitivity test for detection of rifampicin resistance in *Mycobacterium tuberculosis*. **Int J Tuberc Lung Dis**.7: 652-659.
22. Marisa L. Pedulla, Michael E. Ford, Jennifer M. Houtz, Tharun Karthikeyan, Curtis Wadsworth, John A. Lewis, Debbie Jacobs-Sera, Jacob Falbo, Joseph Gross, Nicholas R. Pannunzio, William Brucker, **Vanaja Kumar**, Jayasankar Kandasamy, Lauren Keenan, Svetoslav Bardarov, Jordan Kriakov, Jeffrey G. Lawrence, William R. Jacobs Jr., Roger W. Hendrix and Graham F. Hatfull. **2003**. Origins of highly mosaic mycobacteriophage genomes. **Cell**. 113: 171-182.
23. Alok Dube, K.Jayasankar, L.Prabakaran, **Vanaja Kumar**, PK Gupta. **2004**. Nitrogen laser irradiation (337nm) causes temporary inactivation of clinical

isolates of Mycobacterium tuberculosis. **Lasers in Medical Science**. 9: 52-56.

24. Selvakumar N, **Vanaja Kumar**, P.G. Gopi, S. Sivagamasundari, E. Prabhakaran, Samuel Vasanthan, M. Perumal, P.R. Narayanan. **2005**. Sputum AFB smears reading capability of Senior Tuberculosis Laboratory Supervisor trainees under training at a reference laboratory in India. **Ind J Tub**. 52: 11-14.
25. Graham F. Hatfull, Marisa L. Pedulla, Deborah Jacobs-Sera, Pauline M. Cichon, Amy Foley, Michael E. Ford, Rebecca M. Gonda, Jennifer M. Houtz, Andrew J. Hryckowian, Vanessa A. Kelchner, Swathi Namburi, Kostandin V. Pajcini, Mark G. Popovich, Donald T. Schleicher, Brian Z. Simanek, Alexis L. Smith, Gina M. Zdanowicz, **Vanaja Kumar**, Craig L. Peebles, William R. Jacobs Jr., Jeffrey G. Lawrence, and Roger W. Hendrix. **2006**. Exploring the mycobacteriophage metaproteome: phage genomics as an educational platform. **PloS Genetics**. 2(6): e92.
26. Selvakumar N, M. Gomathi Sekar, **Vanaja Kumar**, D. Vijaya Bhaskar Rao, Fathima Rahman, P.R. Narayanan. 2006. Sensitivity of Ziehl-Neelsen method for centrifuged deposit smears of sputum samples transported in cetyl-pyridinium chloride. **Indian J Med Res**. 124: 439-442.
27. Selvakumar N, **Vanaja Kumar**, S. Sivagamasundari, and P.R. Narayanan. **2006**. Contamination of stored sputum AFB smears with environmental mycobacteria. **Int J Tuberc Lung Dis**. 10: 1299-1301.
28. **Vanaja Kumar**, S. Balaji, N. S. Gomathi, P. Venkatesan, Gomathi Sekar, K. Jayasankar, and P. R. Narayanan. 2007. Phagebiotics to control the exponential growth of normal flora in processed sputum specimens grown overnight in liquid medium for rapid TB diagnosis. **Journal of Microbiological methods**. 68: 536-542.
29. Gomathi, N. S., H. Sameer, **Vanaja Kumar**, S. Balaji, V. N. Azger Dustackeer and P. R. Narayanan. **2007**. *In silico* analysis of mycobacteriophage Che12 genome: characterization of genes required to

lysogenise *Mycobacterium tuberculosis*. **Computational Biology and Chemistry**. 31(2):82-91.

30. Sivakumar, P. M. S. Prabu Seenivasan, **Vanaja Kumar** and Mukesh Doble. **2007**. Synthesis, antimycobacterial activity evaluation, and QSAR studies of chalcone derivatives. **Bioorganic Medicinal Chemistry Letters**.17:1695-1700.
31. Vinoth Kumar, T.S., Kavitha S., Lakshmi Narayanan L., Gomathi, N. S., **Vanaja Kumar**. **2007**. Influence of irrigating needle tip design in removing bacteria from instrumented root canal using single tube luminometer. **Journal of Endodontics** 33: 746-8.
32. Selvakumar N, Michel Premkumar, **Vanaja Kumar**, Gopi PG, Sivagamasundari S, Prabhakaran E, *et al.* **2008**. Staining by phenol ammonium sulphate basic fuchsin of sputum in pot for detection of acid-fast bacilli. **Indian J Med Res**. 128:194-197.
33. Azger Dusthacker, **Vanaja Kumar**, Selvakumar Subbian, Gomathi Sivaramakrishnan, Guofang Zhu, Balaji Subramanyam, Sameer Hassan, Selvakumar Nagamaiah, John Chan and Narayanan Paranj Rama. **2008**. Construction and evaluation of luciferase reporter phages for the detection of active and non replicating bacilli. **J Microbiological Methods**. 73: 18–25.
34. **Vanaja Kumar**, Prabakaran Loganathan, Gomathi Sivaramakrishnan, Jordan Kriakov, Azger Dusthacker, Balaji Subramanyam, John Chan, William R. Jacobs Jr., Narayanan Paranj Rama. **2008**. Characterization of temperate phage Che12: construction of a new tool for diagnosis of tuberculosis. **Tuberculosis**. 88: 616-623.
35. Azger Dusthacker, V.N. Sameer Hassan, **Vanaja Kumar**. **2008**. Tape measure protein having MT3 motif facilitates phage entry into stationary phase cells of *Mycobacterium tuberculosis*. **Computational Biology and Chemistry**. 32: 367-369.

36. N. Selvakumar, **Vanaja Kumar**, P. G. Gopi, S.Sivagamasundari and P. R. Narayanan. **2008**. Pot method for storage and detection of acid-fast bacilli from sputum samples. **Indian J Med Res.** 128:765-768.
37. **Vanaja Kumar**, Raghavan, R., Nagamiah, S., and Chauhan, L.S. **2009**. External quality assessment of smear microscopy by the National Reference Laboratory in nine states of India. **Int J Tuberc Lung Dis.** 13: 1183-1185.
38. Raparti, V., Chitre, T., Bothara, K., **Vanaja Kumar**, Dangre, S., Khachane, C., Gore, S., and Deshmane, B. **2009**. Novel 4-(morpholin-4-yl)-N'-(arylidene)benzohydrazides: synthesis, antimycobacterial activity and QSAR investigations. **Eur J Med Chem.** 44: 3954-3960.
39. Sameer Hassan, Vasantha Mahalingam and **Vanaja Kumar**. **2009**. Synonymous Codon Usage Analysis of Thirty Two Mycobacteriophage Genomes. **Advances in Bioinformatics.** Article ID 316936, 11 pages.
40. Balaji Subramanyam, Azger Dusthacker, Fathima Rehman, Gomathi Sekar, Gomathi N. Sivaramakrishnan, **Vanaja Kumar**. **2010**. An alternative sputum processing method using chitin for the isolation of Mycobacterium tuberculosis. **World J Microbiol Biotechnol.** 26:523–526.
41. Manikkam Radhakrishnan, S. Suganya, Ramasamy Balagurunathan, **Vanaja Kumar**. **2010**. Preliminary screening for antibacterial and antimycobacterial activity of actinomycetes from less explored ecosystems. **World J Microbiol Biotechnol.** 26:561–566.
42. Jerrine Joseph, Sameer Hassan, Vasanthi Rajendran and **Vanaja Kumar**. **2010**. Microbial genome databases: a user's perspective, **Int. J. P.B.S** V1(2).
43. Sivakumar PM, Vanaja Kumar, Prabu Seenivasan, Mohanapriya and Mukesh Doble. **2010**. Experimental and Theoretical approaches to enhance Anti tubercular Activity of Chalcones. **Wseas Transactions On Biology and Biomedicine.** 7: 51-61.
44. Balaji Subramanyam, **Vanaja Kumar**, Venkatesan Perumal and Selvakumar Nagamiah. Phage lysin to supplement phagebiotics to

decontaminate processed sputum specimens. Eur J Clin Microbiol Infect Dis. 2010.

Publications in Proceedings and Books

1. Selvakumar N, **Vanaja Kumar** and Natarajan R. Partial purification, characterization and Anti-tumour properties of L-asparaginase (antileukaemic agent) from a marine vibrio. (1991) p.289-300. In Bioactive compounds from marine organisms. Ed by Mary- Frances Thompson, Rachakunda Sarojini and Rachakunda Nagabushanam. Oxford and IBH Publishing Co. Pvt. Ltd., Bombay, India.
2. **Vanaja Kumar**, Selvakumar N and Natarajan R. Antagonistic properties of Actinomycets isolated from molluscs of Porto-Novo coastal region South India. (1991) In Bioactive compounds from marine organisms. Ed by Mary- Frances Thompson, Rachakunda Sarojini and Rachakunda Nagabushanam. Oxford and IBH Publishing Co. Pvt. Ltd., Bombay, India. Page 267-274.
3. Selvakumar N and **Vanaja Kumar**. Inhibitory activity of Trifluoperazine against Mycobacterium tuberculosis. (in) Non antibiotics. Ed. By AN Chakrabarthy, J Molnar GS Dastidar, N. Motohashi. NISCOM. New Delhi. India. 1998. pp. 176-182.
4. **Vanaja Kumar**. Bioluminescence and luciferase reporter phage assay. In proceedings of international symposium on luminescence and its applications. Vol I MS university of Baroda and Luminescence society of India, Feb 2000, pp 183-185.
5. Jayasankar K, Cheruvu Mani and **Vanaja Kumar**. Biomedical application of luminescence:luciferase reporter phage assay for drug susceptibility testing of Mycobacterium tuberculosis isolates. In proceedings of international symposium on luminescence and its applications. Vol II MS university of Baroda and Luminescence society of India, Feb 2000, pp 9&10.
6. Cheruvu Mani, N.Selvakumarn, Vanaja Kumar and PR Narayanan. Comparison of Luciferase reporter Phage and Phage amplified biologically assays with indirect sensitivity test to detect rifampicin resistance in

- Mycobacterium tuberculosis*. Proceedings of the National Seminar on Luminescence and its Applications. Osmania University Hyderabad. 2001. pp. 232-234.
7. Cheruvu Mani, N. Selvakumar, **Vanaja Kumar**, Sujatha Narayanan and P.R. Narayanan. Rapid identification of multi-drug resistant tuberculosis. Proceedings of Golden Jubilee Celebrations of DNA Discovery. Ethiraj College. Chennai. 2003.
 8. Balaji, S., Gomathi Sekar, Sachin Chandraker, **Vanaja Kumar**, N. S. Gomathi, Fathima Rehman and P. R. Narayanan. 2005. An alternative method of sputum processing to detect *Mycobacterium tuberculosis*. Proceedings of the DST, Govt. of. India, Sponsored National Symposium on Recent Trends in Microbial Biotechnology, department of Microbiology, Sri Sankara Arts and Science College, Kanchipuram, India. 89-95.
 9. Selvakumar N, Michel Premkumar, **Vanaja Kumar**. Gopi PG, Sivagamasundari S, Prabhakaran E, *et al.* 2007. Pot staining of sputum for detection of acid-fast bacilli. Tuberculosis Surveillance Research Unit Progress Report. Amsterdam: KNCV.
 10. Sergio Luis Yzquierdo, **Vanaja Kumar**, Dihadenys Lemus, Ernesto Montoro and Ruth McNerney. MYCOBACTERIOPHAGE AND CONTROL OF TUBERCULOSIS. Contemporary Trends in Bacteriophage Research. Editor: Horace T. Adams, pp 1-21.
 11. **Vanaja Kumar**. Chapter 5. DRUG TARGETS IN *MYCOBACTERIUM TUBERCULOSIS*,