

F1 EDUCATION/TRAINING: INSTITUTION_S__AND_LOCATION	F2 DEGREE_S__if_applicable_	F3 YEAR_S_	F4 FIELD_S__OF_STUDY
Annamalai University, India	M.S.	1977	Marine Biology
Annamalai University, India	Ph.D.	1982	Marine Microbiology
Hiroshima University, Japan	D. Ag.	1990	Agriculture, Food Microbiol. & Hyg.
RESEARCH AND PROFESSIONAL EXPERIENCE:	Agency	Point_of_Contact	Performance_Period_Budg et
1998 – pres. Biotechnology Planetary Protection Group, Jet Propulsion Laboratory			
•Direct the R&D of Validation sub-task of Mars Exploration Technology (MET) task that enables cleaning, sterilization and validation of spacecraft components.			
•Microbial monitoring ISS drinking water and spacecraft assembly facilities			
1998 – 1999 Senior Scientist, Astrobiology, JPL			
•Interface with JPL astrobiology and Biotechnology & Planetary Protection groups.			
1996 – 1997 Senior Researcher, UW-Milwaukee			
•Systematically arranged the phylogenetic affiliation of the genus <i>Shewanella</i> .			
1993 – 1996 Chief Scientist, Nippon Suisan Kaisha, Japan			
1990 – 1993 Senior Scientist, Marine Biotechnol. Inst., Ministry of Trade and Industry, Japan			
1986 – 1990 Hiroshima University, Japan			
1981 – 1986 Junior Sci. Assistant, Export Inspection Agency, Ministry of Commerce, India			
1977 – 1981 Annamalai University, India			

SELECTED PUBLICATIONS

9 patents that include bacterial strains, DNA sequences in the field of biotechnology, diagnostic microbiology. 70 plus publications in peer-reviewed journals.

1. La Duc, M. T., Satomi, M., and K. Venkateswaran. 2004. *Bacillus odysseyi* sp. nov., a round-spore-forming bacillus isolated from the Mars Odyssey spacecraft. *Int J Syst Evol Microbiol.* 54:195-201.
2. Dickinson, D. N., La Duc, M. T., Haskins, W. E., Gornushkin, I., Winefordner, J. D., Powell, D. H., and K. Venkateswaran. 2004. Species Differentiation of a Diverse Suite of *Bacillus* Spores Using Mass Spectrometry Based Protein Profiling. *Appl Environ*

Microbiol. 70: 475-482.

3. La Duc, M.T., M. Satomi, N. Agata, and K. Venkateswaran. 2004. *gyrB* as a phylogenetic discriminator for members of the *Bacillus anthracis-cereus-thuringiensis* group. *J. Microbiol. Meth.* 52:367-77.

4. Dickinson, D.N., M.T. La Duc, M. Satomi, I. Gornuskin, J.D. Winefordner, D.H. Powell and Venkateswaran, K. 2004. Rapid identification of microbial species isolated from spacecraft associated environment using MALDI-TOFMS. *Journal of Microbiological Methods* (available on line: doi:10.1016/j.mimet.2004.02.011).

5. Link, L., Sawyer, J., Venkateswaran, K., and Nicholson, W. 2004. Extreme spore UV resistance of *Bacillus pumilus* isolates obtained from an ultra clean spacecraft assembly facility. *Microbial Ecology*. (available on line; DOI:10.1007/s00248-003-1029-4)

6. La Duc, M. T., Kern, R., and K. Venkateswaran. 2004. Microbial Monitoring of Spacecraft and Associated Environments. *Microbial Ecology*. (available on line; in press)

7. Venkateswaran K., Hattori N., La Duc M.T., Kern R. 2003. ATP as a Biomarker of Viable Microorganisms in Clean-room Facilities. *J Microbiol Meth.* 52: 367-377.

8. Venkateswaran, K., Chen, F., Kempf, M. Satomi, M., and Kern, R. 2003. Description of *Bacillus nealsonii* sp. nov.- a gamma radiation resistant bacteria isolated from a spacecraft assembly facility. *Intern. J. Syst. Evol. Microbiol.* 53: 165-172.

9. La Duc M. T., Nicholson W., Kern R., and K. Venkateswaran. 2003. Microbial Characterization of the Mars Odyssey Spacecraft and Its Encapsulation Facility. *Environ Microbiol.* 5:977-85.

10. La Duc, M. T., Sumner, R., Pierson, D., and K. Venkateswaran. 2003. Characterization and Monitoring of Microbes in the International Space Station Drinking Water. Proceedings from the 33rd International Conference on Environmental Systems, July 7-10, 2003, Vancouver, Canada. SAE Technical paper series 2003-01-2404.

11. Benardini, J.N., Sawyer, J., Venkateswaran, K., and Nicholson W.L. 2003. Spore UV and acceleration resistance

of endolithic *Bacillus pumilus* and *B. subtilis* isolates obtained from Sonoran desert basalt: implications for lithopanspermia. *Astrobiology*, 3:709-717.

12. Venkateswaran, K., M. Satomi, S. Chung, R. Kern, R. Koukol, C. Basic, and D. White. 2001. Molecular Microbial Diversity of Spacecraft Assembly Facility. *Syst. Appl. Microbiol.*, 24: 311-320.

13. Venkateswaran, K., Vu, A., Musick, M., Echeverria, C., Chung, S., Satomi, M., Koukol, R., Kern, R., and White, D.C. 2000. Phylogenetic characterization and description of novel heat-tolerant *Bacillus* species isolated from spacecraft assembly facility. *Proceeding of the International Conference on Environmental Systems*. 00ICES-129.

14. La Duc, M.T., Pierson, D., and K. Venkateswaran. Evidence of Pathogenic Microbes in the International Space Station Drinking Water: Reason for Concern? *Habitation*. 2004. (in press)

15. Venkateswaran, K., Chung, S., Allton, J., and Kern, R. 2004. Evaluation of various cleaning methods to remove *Bacillus* spores from spacecraft hardware materials. *Astrobiology*. (in press).

16. Kempf, M., Chen, F., Kern, R. and Venkateswaran, K. 2004. Recurrent isolation of hydrogen peroxide resistant spores of *Bacillus pumilus* from a Spacecraft Assembly Facility. *Appl. Environ. Microbiol.* (submitted).

TEACHING EXPERIENCE:

- Undergraduate and Graduate classes taught:

- i. Microbiology, Microbial Ecology, Food Microbiology, and Environmental Microbiology

- Graduate students mentored/advised:

- i. Danielle Dickinson, University of Florida-Gainesville (Advisor); Will be graduated in May 1st 2004.

- ii. James Benardini, University of Idaho-Moscow (Mentor)

- iii. Ken Widmer, Texas A&M University (Graduate committee member)

- Undergraduate students mentored

- i. 2 University of Milwaukee students (1996 to 1998)

- ii. 20 California Institute of Technology SURF, MURF, Co-op students since 1998

•Guest lectures

i.Numerous guest lectures in national and international universities as well as institutions since 1986.

•Adjunct faculty memberships at other universities, etc

i.Adjunct faculty at the University of Idaho-Moscow; Microbiology and Molecular Biology Center

Current and Pending Research Support

Task Title Program Name

Planetary Protection Program	NASA/S	Samad Hayati 818-354-8273	9/23/03 – 9/23/05 \$850,000 for FY'04
Characterization and monitoring microbial species in the International Space Station	NASA/U	Name: Charles Barnes	10/01/02 – 09/30/05 \$492,000 for FY'04
Microbial Diversity of spacecraft assembly facilities	NASA/S	Name: John Rummel	10/01/01 – 09/30/04 \$150,000 per year
Survival of Microorganisms Isolated from Spacecraft and Assembly Facilities Under Simulated Martian Environments	DRDF/ JPL	Name: Tom Prince	02/07/03 – 08/06/04 \$200,000 total
Microbial Survival on Spacecraft Surfaces Exposed at Earth-Sun L1	NASA/S	Name: John Rummel	01/01/04 – 12/31/06 \$125,000 per year
Development of an in situ hydrothermal vent probing and sampling device for microbial analysis	NASA/ ASTID	Name: Michael Myers	01/01/04 – 12/31/06 \$200,000 per year
	F2	F3	F4
F1			
Pending Spacecraft Sterilization Using Supercritical Carbon Dioxide	NASA/ MEP	Name: Dave Lavery	01/01/04 – 12/31/06 \$150,000 per year (JPL) PI: Ron Crawford
Pending Sterilization of Spacecraft Subsystems by using Electron Beam-Irradiation	NASA/ MEP	Name: Dave Lavery	01/01/04 – 12/31/06 \$225,000 per year (JPL) PI: Suresh Pillai
Pending Cleaning To Achieve Sterility	NASA/ MEP	Name: Dave Lavery	01/01/04 – 12/31/06 \$200,000 per year (JPL) PI: Roger Kern
Pending Development of a DNA-based Detector Array for Microbial Monitoring of the ISS Water System	NASA/ Code R	Name: Tim Krabach	03/01/04 – 12/31/06 \$100,000 per year (JPL) PI: David Stahl
Pending Development of an integrated biosensor that collects and monitors microorganisms of ISS ecosystem	NASA/ Code R	Name: Tim Krabach	03/01/04 – 12/31/06 \$100,000 per year (JPL) PI: C. Yalamanchili