

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel in the order listed on Form Page 2.  
Photocopy this page or follow this format for each person.

NAME		POSITION TITLE	
Anita Mahadevan-Jansen		Assistant Professor of Biomedical Engineering	
EDUCATION/TRAINING ( <i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i> )			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of Bombay, Bombay, India	B.Sc.	1988	Physics
University of Bombay, Bombay, India	M.Sc.	1990	Physics
The University of Texas at Austin, Austin, TX	M.S.	1993	Biomedical Engineering
The University of Texas at Austin, Austin, TX	Ph.D.	1996	Biomedical Engineering

**RESEARCH AND PROFESSIONAL EXPERIENCE:** Concluding with present position, list, in chronological order, previous employment, experience, and honors. Include present membership on any Federal Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past three years and to representative earlier publications pertinent to this application. If the list of publications in the last three years exceeds two pages, select the most pertinent publications. **DO NOT EXCEED TWO PAGES.**

September 1998 onwards      Assistant Professor, Department of Biomedical Engineering, Vanderbilt University, Nashville, TN.  
 July 1997 - August 98        Research Associate, Department of Biomedical Engineering, Vanderbilt University, Nashville, TN.  
 May 1996 – December 1996    Postdoctoral Fellow, Biomedical Engineering Program, University of Texas at Austin, Austin, TX.  
 August 1990 – April 1996      Research Assistant, Biomedical Engineering Program, University of Texas at Austin, Austin, TX.

**Honors & Awards:**

Scholarships    SPIE Continuing Education Scholarship, SPIE, Bellingham (August 1996)  
                       Nikon Precision Inc. Scholarship (August 1996)  
                       University continuing fellowship, University of Texas, Austin (Sept. 1994 - May 1995)  
                       Competitive academic fellowship, University of Texas, Austin (Sept. 1990 - Aug. 1991)  
                       University merit scholarship, University of Bombay, India (June 1988 - May 1990)  
                       National merit scholarship, Govt. of India (June 1983 - May 1988)

Awards         Distinction, Merit List of Physics Graduates, University of Bombay (1990)  
                       Merit List of Physics Graduates, University of Bombay (1988)

**Professional Affiliation**

American Society for Lasers in Medicine and Surgery  
 SPIE (Society for Photo Instrumentation Engineers)  
 Biomedical Optics Society  
 Optical Society of America  
 Society of Applied Spectroscopy  
 Society of Women Engineers  
 Vanderbilt Women's Faculty Organization

**Professional Activities**

Journal Reviewer -    Journal of Biomedical Optics, Applied Optics, Applied Physics A, Photochemistry and Photobiology, Lasers in Medicine and Surgery, Optics Letters, Journal of Raman Spectroscopy, Applied Spectroscopy  
 Chair and Organizer - Biomedical Optics, In: 2<sup>nd</sup> Tennessee Biomedical Engineering Conference, Nashville, TN, 1999  
 Conference Chair -    Biomedical Spectroscopy and Other Novel Techniques, In: *BiOS 2000*, San Jose, CA, 2000  
 Program Committee -    Biomedical Optical Spectroscopy and Diagnostics, Biomedical Topical Meetings 2000, Optical Society of America, Miami, FL, 2000  
 Program Committee -    Biomedical Diagnostic, Guidance, and Surgical Assist Systems In: *BiOS 2001*, San Jose, CA, 2001 and In: *BiOS 2003*, San Jose, CA 2003.  
 (and Session Chair)  
 Conference Chair -    Biomedical Vibrational Spectroscopy, In: *BiOS 2002*, San Jose, CA, 2002 and In: *BiOS 2004*, San Jose, CA, 2004  
 Student Counselor -    Society of Women Engineers, 1998 - current

Secretary -

Vanderbilt Women's Faculty Organization, 1998-1999

**Research Projects Ongoing or Completed During the Last 3 Years**

“Enlightened Neurons: Non-ablative applications of the Free Electron Laser in Neurosurgical Applications”

*As part of:* “Vanderbilt Free electron Laser Center for research in surgery, medicine, photobiology, and materials science”

Principal Investigator: David Piston, Ph.D.

Role of AMJ: Co-PI of sub-contract

Source: DOD (AFOSR)

Period: 05/01/01 - 10/30/03

The objective of this project is apply the FEL for non-ablative applications in Neurosurgery.

“Diagnosis of Cervical and Vulvar Precancers using Raman Spectroscopy”

Principal Investigator: Anita Mahadevan-Jansen, Ph.D.

Source: National Institutes of Health (R01)

Period: 05/01/02 - 04/30/06

The overall objective of this project is to develop Raman spectroscopy as a diagnostic tool to identify cervical and vulvar dysplasia in patients in vivo.

“Brain Tumor and Tumor Margin Identification using Optical Spectroscopy”

Principal Investigator: Anita Mahadevan-Jansen, Ph.D.

Source: National Institutes of Health (R01)

Period: 01/01/01 - 12/31/05

The overall objective of this project is to develop combined autofluorescence and diffuse reflectance spectroscopy as an intra-operative guidance tool to identify tumor resection margins in brain cancer patients.

“Raman Spectroscopy for Cancer Detection” (Developmental Project)

*As part of:* “The Vanderbilt In Vivo Imaging Center (VIVID)”

Principal Investigator: David Piston, Ph.D.

Role of AMJ: Developmental Project PI

Source: National Institutes of Health (P20)

Period: 12/01/00 - 05/31/03

This is a pre-center grant (P20) towards the formation of the Vanderbilt In Vivo Imaging center based on optical imaging techniques. Within this context, one of the developmental projects is the development of instrumentation for macroscopic as well as microscopic application of Raman spectroscopy in Biomedicine.

“Vanderbilt - Northwestern - Texas - Harvard – MIT (VaNTH): Engineering Research Center for Bioengineering Educational Technology”

Principal Investigator: Thomas R Harris

Role of AMJ: Domain Expert (Bio-Optics)

Source: National Science Foundation

Period: 9/1/99 – 8/31/04

This is a unique ERC devoted to the development of a new modality in pedagogy based on the “How People Learn” framework applied towards Bioengineering education and its implementation using new technology. Within this context, one of the thrust domains is Bio-Optics.

"Identification of Bacterial Strains Causing Otitis Media using Raman Spectroscopy"

Principal Investigator: Anita Mahadevan-Jansen, Ph.D.

Source: Vanderbilt University Research Council

Period: 4/1/99 - 6/30/00

The overall objective of this project is to develop Raman spectroscopy as a tool for identifying the bacteria and bacterial strains that cause Otitis Media in children to allow specific antibiotics targeting the bacteria identified to be prescribed.

"Development of Raman Probes for Cancer Detection Using Near-Infrared Raman Spectroscopy"

Principal Investigator: Anita Mahadevan-Jansen, Ph.D.

Source: National Science Foundation (POWRE Program)

Period: 9/1/98 - 9/30/99

The overall goal of this project is to design novel probes that allow Raman spectra to be measured from human patients in contact as well as through an endoscope for disease detection.

**"Spectroscopic-guided FEL Ablation of Tissue using Hollow Waveguides"**

Principal Investigator: Wei-Chiang Lin (Anita Mahadevan-Jansen – mentor)

Source: Office of Naval Research (ONR) – FEL Laser Fellowship (renewal)

Period: 10/98 – 9/99

The major goals of this project are to characterize the spectroscopic signatures of normal and tumor brain tissues before, during and after FEL ablation and to build a combined probe that provides diagnostic feedback to guide FEL beam delivery.

**"Fluorescence Spectroscopy for Brain Tumor Margin Detection"**

Principal Investigator: Anita Mahadevan-Jansen, Ph.D.

Source: Start-up Funds (Departmental Whitaker Special Opportunity Award)

Period: 7/1/97 - 6/30/99

The goal of this project is to assess the feasibility of fluorescence spectroscopy for brain tumor and tumor margin detection. *In vitro* studies were performed and a pilot *in vivo* study was planned.

**Selected Publications:****Patents:**

- 1) Lin WC, Mahadevan-Jansen A, Toms SA, Jansen ED, "Brain tumor demarcation using optical spectroscopy" (*patent granted, issuance number pending*).
- 2) Mahadevan-Jansen A, Richards-Kortum R, Follen Mitchell M. Spectroscopic Probe for *in vivo* Measurement of Raman Signals, US Patent No. 5,842,995, International Patent Application No. PCT/US97/10710.
- 3) Richards-Kortum R, Mahadevan A, Ramanujam N, Follen Mitchell M. Near-Infrared Raman Spectroscopy for *in vitro* and *in vivo* Detection of Cervical Precancers, US Patent Application No. 08/667,993 (*patent issued*), 2000
- 4) Richards-Kortum R, Mahadevan A, Ramanujam N, Follen Mitchell M. Optical Method for the Detection of Cervical Neoplasia using Raman and Fluorescence Spectroscopies, US Patent No. 5,697,373.

**Peer-Reviewed Journal Articles:**

- 1) Lieber CA, Mahadevan-Jansen A. "Automated Method for the Subtraction of Fluorescence from Biological Raman Spectra, *Applied Spectroscopy*, (in review), 2002.
- 2) Lin WC, Toms SA, Jansen ED, Mahadevan-Jansen A. "Intraoperative Application of Optical Spectroscopy in the Presence of Blood" *IEEE Journal of Quantum Electronics*, **7**(6), 2002.
- 3) Utzinger U, Mahadevan-Jansen A, Hinzelman D, Follen M, Richards-Kortum R. Near Infrared Raman Spectroscopy for *In Vivo* Detection of Cervical Precancers, *Applied Spectroscopy*, **55**(8), 2001
- 4) Lin WC\*, Toms SA, Johnson M, Jansen ED, Mahadevan-Jansen A. *In Vivo* Brain Tumor Demarcation using Optical Spectroscopy, *Photochemistry and Photobiology*, **73**(4), 396-402, 2000.
- 5) Lin WC\*, Toms SA, Motamedi M, Jansen ED, Mahadevan-Jansen. A Brain Tumor Demarcation using Optical Spectroscopy: An *in vitro* study, *Journal of Biomedical Optics*, **5**(2), 2000.
- 6) Mahadevan-Jansen A, Ramanujam N, Mitchell MF, Richards-Kortum R. Development of an *In Vivo* Raman Probe for Cervical Precancer Detection, *Photochemistry and Photobiology*, **68**(3), 427-431, 1998.
- 7) Mahadevan-Jansen A, Mitchell MF, Ramanujam N, Malpica A, Thomsen S, Utzinger U, Richards-Kortum R. Near- Infrared Raman Spectroscopy for the Diagnosis of Cervical Precancers. *Photochemistry and Photobiology*, **68**(1), 123-132, 1998.
- 8) Mahadevan-Jansen A, Richards-Kortum R. Raman Spectroscopy for the Detection of Cancers and Precancers. *Journal of Biomedical Optics*, **1**(1), 40-79, 1996.
- 9) Mahadevan A, Mitchell MF, Silva ES, Thomsen S, Richards-Kortum R. Study of the Fluorescence Properties of Normal and Neoplastic Human Cervical Tissue. *Lasers in Medicine and Surgery*, **13**, 647-655, 1993.
- 10) Ramanujam N, Mitchell MF, Mahadevan A, Thomsen S, Malpica A, Wright T, Atkinson A, Richards-Kortum R. Development of a Multivariate Statistical Algorithm to Analyze Human Cervical Tissue Fluorescence Spectra Acquired *In Vivo*, *Laser in Surgery and Medicine*, **19**(1), 46-62, 1996.
- 11) Ramanujam N, Mitchell MF, Mahadevan A, Thomsen S, Malpica A, Wright T, Atkinson A, Richards-Kortum R. Spectroscopic Diagnosis of Cervical Intraepithelial Neoplasia (CIN) *In Vivo* using Laser-Induced Fluorescence Spectra at Multiple Excitation Wavelengths, *Laser in Surgery and Medicine*, **19**(1), 63-74, 1996.