# Curriculum Vitae

**Dr. T. Arockiadoss**, M.Sc., B.Ed., M. Phil., Ph.D.,
Senior Research Fellow - Semiconductor Lab,
Dept. Physics, IIT-Madras
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Tamil Nadue, India
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Date of Berth: April-09-1973

## Education

**Ph. D in Physics-Biomaterials** from University of Madras, Tamil Nadu, India

Thesis: '**Development Of (Interdisciplinary) Conducting Biopolymer Using fish Protein**'
Guide: Dr. Mary Babu, Deputy Director, Central Leather Research Institute, Chennai
Co-Guide: Rev. Dr. Francis P. Xavier SJ, Senior Lecturer, Loyola College, Chennai,
Awarded on Septemper-2004

**M. Phil in Physics from** University of Madras**,** completed on Febraury-2000

Thesis: '**pH- Based Electrical Conductivity Studies on Fish Muscle Protein**'
Guide: Rev. Dr. Francis P. Xavier SJ, Senior Lecturer, Loyola College, Chennai
College Education

| Course | Subject | Institution | Class | Year |
|---|---|---|---|---|
| B.Ed | Physical Science | Lakshmi College of Education, Gandhigramam, Tamil Nadu, India | I | 1996 |
| M.Sc | Physics | N.M.S.S.V.N College, Madurai, Tamil Nadu, India | I | 1996 |
| B.Sc | Physics | Arul Anandar College, Madurai, Tamil Nadu | I | 1993 |
| DCA – Diploma in Computer Applications | Computer Applications | Loyola College, Chennai, Tamil Nadu, India | I | 1999 |
| DHA Diploma in Hardware | Computer Hardware | Aptech, Chennai, Tamil Nadu, India | I | 2003 |

## Honors

Junior Research Fellow **(JRF)**
Tamil Nadu Directorate of College Education Research Fellowship Sep-1998 to May-2001

Senior Research Fellowship **(SRF)**
Council of Scientific and Industrial Research (CSIR), India, June-2001 to June 2004

## Current Assigments

**Senior Research Fellow:**

Thin film of Indium Gallium Nitride (IGN) for optoelectronic and photovoltaic application: Basic studies, Department of Physics, IIT-Madras, Chennai-600 036

**Patent:**

A. Subrahmanayam and **T. Arockiadoss, "**A Device and A Method For The Preparation Of Oxygen For Artificial Infusion In Human Blood", No:- 427 Che 2006.

**Reviewer:**

Biosensor and Bioelectronics Journal from 2004.
Biophysical Journal from 2006.

**Project Guidance:**

**M.Sc Project (Student)**

Physical characterization studies on collagen thin film, Department of Physics, Loyola College, Chennai -34, 2004-2005

**M.Phil Project (Student)**

Physical characterization studies on chitoson thin film, Department of Physics, Loyola College, Chennai -34, 2004-2005

**Technical Knowledge**

**Protein isolation & Purification**

- Gel Electrophoresis
- Column Chromatography
- High Performance Liquid Chromatography (HPLC)

**Thin Film Techniques**

- DC-Magnetron Sputtering
- Conjugated biopolymer
- Evaporation Method
- Sol gel method

**Conducting Techniques**

- Hall Mobility
- Four Probe
- Two Probe
- Temperature dependent conductivities
- Direct & Indirect band gap or activation energy calculation

**Photo catalytic Technique**

- $TiO_2$ nano thin film

**Spectroscopic Techniques**

- Fourier Transfer –Infra Red (FT-IR)
- Electron Paramagnetic resonance (EPR)
- Nuclear Magnetic Resonance (NMR)
- Circular Dichrosim CD
- Cyclic Volta metric (CV) (electron transfer reaction (reduction and oxidation potential))
- Fluorescent

**Microscopy techniques**

- Transmission Electron Microscopes
- Scanning Electron Microscopes
- Certificate of Training:

**Work Experience**

- Worked as part time lecturer in Department of Physics, Loyola Evening College (Chennai) during 1998-2001

**Publications:**

**Book Publication**

**T. Arockiadoss**, S. Vincent, F. P. Xavier, K.S. Nagaraja and M. Selvanayagam pH- Based

Electrical Conductivity Studies On Fish Muscle Protein, Proceeding of National Symposium On Environmental Pollution and Ecoplaning, S.K. University, 1998, Dumka, India

**Papers Published**

| S.No | Publishing Team | Topic |
|---|---|---|
| 1 | **Arockiadoss**<br>Vincent<br>Xavier<br>Nagaraja<br>Selvanayagam | Based Electrical Conductivity Studies On Fish Muscle Protein, Bull. Envirn. Cont. and Toxic., 147, 647 –649 |
| 2 | **Arockiadoss**<br>Vincent<br>Xavier<br>Nagaraja<br>Selvanayagam | Electrical Conductivity Studies of fish in contaminated environment i) tannery effluent and ii) Domestic detergent, Indian Journal of Environmental Protection, 18(7), 495-497 |
| 3 | **Arockiadoss**<br>Francis Xavier<br>Mary Babu | Isolation and charecterization of metal doped fish Protein for conducting biopolymer, polymer, (communicated) |

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|---|---|---|
| 4 | **Arockiadoss** Francis Xavier Mary Babu | Variation of electrical conductivity on metal doped fish protein, Environmental Research (communicated) |
| 5 | **Arockiadoss** N.S. Sundaram, F.P. Xavier, S. Thiruvengadam, T. Daniels-Race and Mary Babu | Characterization Of Metal Doped Collagen Thin Film For Conducting Biopolymer |
| 6 | **Arockiadoss** N.S. Sundaram, F.P. Xavier, S. Thiruvengadam, T. Daniels-Race and Mary Babu | Characterization Of Metal Doped Chitosan Thin Film For Conducting Biopolymer |

**Paper Presented**

| S.No | Presentation Team | Topic |
|---|---|---|
| 1 | **Arockiadoss** Francis Xavier Thiruvengadam Daniels-Race Mary Babu | Development of Collagen Based Organic Semiconductor, AVS 52nd International Symposium and Exhibition, October 30 to November 4, 2005, Boston, MA, USA |
| 2 | **Arockiadoss** Francis F.P Xavier Thiruvengadam Mary Babu | Electrical Conductivity Studies of fish in contaminated environment i) tannery effluent and ii) Domestic detergent, Indian Journal of Environmental Protection, 18(7), 495-497 |
| 3 | **Arockiadoss** Francis Xavier Karthikeya Prabu Mary Babu | Development of organic semiconductors using metal doped fish protein, AVS 51st International Symposium, November 14, 2004, CA, USA |
| 4 | **Arockiadoss** Francis Xavier Vincent Nagaraja Selvanayagam | Variation of Electrical conductivity on metal-doped fish protein. 5th International Exhibition-Congress on Chemical Engineering and Biotechnology, 8 to 12 May ACHEMA, 2001, Beijing, China |
| 5 | **Arockiadoss** Francis Xavier Vincent Nagaraja Selvanayagam | Electrical conductivity on metal doped fish protein, The leading Event for Chemical Engineering, Environmental Protection and Biotechnology May - 22-27 ACHEMA, 2000, Frankfort |
| 6 | **Arockiadoss** Francis Xavier | Electrical Conductivity Studies of fish in contaminated environment i) tannery effluent and ii) |

| | | |
|---|---|---|
| | Vincent Nagaraja Selvanayagam | Domestic detergent, International Conference on Environment and Bioethics, Loyola College, 14-16, January- 1999, Chennai, India |
| 7 | **Arockiadoss** Francis Xavier Vincent Nagaraja Selvanayagam | pH- Based Electrical Conductivity Studies On Fish Muscle Protein, National Symposium On Environmental Pollution and Ecoplaning, S.K. University, 20-21, March 1998, Dumka, India |

**Abroad Visited:** AVS 51st International Symposium, California, USA

**Ph.D work:**

Electrically conducting biopolymers are development by metal-doped fish muscle protein. The protein complex or conjugated biopolymers are to be made electrically conducting via backbone chain of molecular charge (donor or acceptors). Various metals doped proteins ($Cu^{2+}$, $Cd^{2+}$, and $Pb^{2+}$) are blended with 3% Polyvinyl Alcohol and prepared thin film. They also can be made an electrically and an optically anisotropic. The proteins are isolated and purified and metal dopent ensured by AAS, the secondary structure were ensured by Cyclic Volta metric (CV), functional groups are studied by FTIR, thermal parameters were analyzed using DSC and TGA, surface morphology analyzed by SEM. However, thorough understanding of the properties of these rather new materials is required to make them viable for potential applications like Organic Semiconductor, Humidity sensors, Non-linear Optical materials and Fuel cell.

**Research Interest:**

Theoretical as well as Experimental investigation of soft matter physics, systems Protein thin film, Organic semiconductor, Inorganic thin-film and Photocatalytic reaction.

**References Contact Information:**

**Dr. Mary Babu**
Deputy Director and Head
Biomaterials Division
Central Leather Research Institute
Adyar, Chennai-600 020
Tamil Nadu, India
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**Dr. A. Subrahmanayam**
Prof. and Head

**Rev. Dr. Francis P. Xavier, SJ**
Lecturer,
Department of Physics, Loyola College
Nungambakkam, Chennai- 600 020
Tamil Nadu, India
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