Welcome to Thin Film Laboratory

Facilities

DC /RF/Pulsed Magnetron Sputtering

Pulsed Laser Deposition (PLD)

Thermal evaporation unit

Electron Beam evaporation unit

Spin coating unit

Profilometer

Electrochemical workstation

PULSED DC POWER SOURCE

Four Probe set up

Dr B.Subramanian's research experience …….

Current research interests include surface engineering of bio implantable substrates for artificial organs with hard coatings, oxide reinforced ceramics and thin film metallic glasses using physical vapor deposition processes like sputtering and pulsed laser deposition. He is also involved in the preparation and characterization of semiconducting thin film electrodes for dye sensitized solar cells.

His main focus is on developing newer biomaterials using techniques which make highly biocompatible coatings for medical devices, in particular vascular devices, dental and orthopedic implants. His work on surface modification includes surface engineering of bioimplantable substrates such as 316L stainless steel, Titanium Ti-6Al-4V and actual implants like screws, stents, artificial blood vessels with biomaterials like transition metal nitride hard coatings Titanium Nitride (TiN) as single layer and nanocomposites like TiCN, TiSiN and multilayers of TiN/TiAlN,TiN/VN, TiN/NbN. In addition, he is currently working on thin film metallic glasses of Zr-,Ti-, and Mg-based (biodegradable), Diamond like carbon and bioceramics Hydroxyapatite, Al_2O_3 etc. His group also conducting analysis of antimicrobial active metal oxide impregnated textiles for nosocomial applications.

For *in-vivo* studies (including cytotoxicity, haemocompatibility and histopathology) on the components fabricated in his laboratory, he works in union with Sri Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram.

He has successfully completed three grant-in-aid projects as Principal Investigator sponsored by DST New Delhi and BRNS, Mumbai. He has completed a DST sponsored Project on "Development of nanoscale multilayered and nanocomposite super hard coatings by reactive magnetron sputtering for bio medical applications" on January 2012 (ranked very good by DST-PAC). He was a member of the CSIR Network project on "Development of speciality inorganic materials for diverse applications" (Rs 115 Lakhs). He was PI for a consultancy service on "Advice on Sputter Coating of Titanium Nitride onto Nickel or Chrome Plated Stainless Steel Needles" to Nano Marker's Trichy, 2012 (small scale industry). He filed two patents to his credit.

Presently he is PI for a BRNS sponsored project and also a PI for a work package of CSIR-12FYP project on "Development of bioactive glassy metals coated implants and antimicrobial active immobilized fabrics for human healthcare (M2D)", 2012 – 2017 (Rs. 1.66 Crores).

He was awarded research grant under SERC Fast Track Scheme for Young Scientists -2005 by DST, New Delhi. He has been nominated by INSA, New Delhi under International Collaboration / Bilateral Exchange Programme for the year 2010-11 and deputed by CSIR to avail it in Osaka University, Japan for two months. He has also availed the FY 2011 JSPS Long term invitation fellowship from 1st May 2011 for ten months on deputation. He is also a recipient of the Brainpool Fellowship of South Korea for the year 2010.

He is the Coordinator of an Industry oriented Technology Course on "Surface coatings by Physical Vapor Deposition (PVD), Chemical Vapor Deposition (CVD) and surface analyses" being conducted at CECRI, Karaikudi since 2003. He has a publication record of 70 research papers in peer reviewed International journals to his credit. He is a faculty for the B.Tech course (Chemical and Electrochemical Engineering) being conducted at CSIR-CECRI. He delivered more than 15 invited lectures in academic and research institutions apart from his deliberations in National and International conferences.

His administrative responsibilities at CECRI include member of Management Council, Knowledge Resource Committee, Manpower Committee for providing contract workers, Collegiums for stage-II for Performance Mapping of Scientists. He was member of PG Board of Studies of Bishop Heber College, Tiruchirappalli for two successive terms 2009-13.

TEAM BS

Dr.B.Subramanian(BS), Senior Scientist (Joined CECRI-Feb2002)& Project Leader

Dr.A.K.Nanda Kumar CSIR-SRA (Joined April 2013), PhD in physics from Anna University, Chennai. Post doc at Hokkaido University, Japan (2008-2012), post doc at Case Western Reserve University, USA (2012-2013).

Ms.V.V.Anusha Thampi (joined April 2013) SRF in BRNS Sponsored Grant in Aid Project, M.Tech in Nanoscience and Nanotechnology (2012 Gold medalist), B.Tech in Bio-Tech and Bio-chemical Engineering.

Mr.S.Thanka Rajan (joined March 2013) PA-III in CSIR 12th Five Year plan, M.sc in Physics, M.Tech in Nanotechnology .

From left to right: Ms.V.V. Anusha Thampi, myself (Dr.B.Subramanian), Dr.A.K. Nanda Kumar and Mr.S.Thanka Rajan.

Dr.Nanda Kumar busy with MIM capacitor fabrication using PLD

Thanka Rajan growing thin films using PVD technique

Anusha doing bio-surface engineering and handling bacteria

Er.S.Sathish demonstrating his skills

Explaining our group activities to Singapore Foreign Minister and Ex-Finance Minister, India

Lecture session to thin film group

by Dr.Zoltan Labadi, Hungarian Academy of sciences

by Professor Shoji Kaneko,Japan

Convened a National Conference at VIT

Chief Guest in a National Conference

Chairing a session in a workshop at IIT Madras

Tasting Korean Food with Dr. Nanda Kumar in a Conference at Busan South Korea(March 2010)

with my friends Dr.Yugeswaran and Dr.Nanda Kumar in a Conference at Hakkone,Japan(Sept 2011)

Visited Dong-Eui University, South Korea during Brainpool fellowship

With my Japanese host Professor during my JSPS Fellowship in Japan

With my family in Japanese Kimono

Little chairperson –junior "BS"