

## Personal information

Date of Birth: 02-03-1983

Citizenship: Australian

Gender: Male

## Education

2007 – 2011 **PhD** – Department of Biomedical Engineering, UMCG, University of Groningen, Groningen, The Netherlands.

**Research topic** - *Role of extracellular DNA in bacterial biofilm formation*

2005 – 2006 **Postgraduate Diploma in Chemistry** - School of Applied Chemistry, Curtin University of Technology, Perth, Western Australia, Australia.

**Research topic** – *Redox mechanism of copper in alkaline and acidic solution*

2000 – 2003 **Bachelor of Chemistry** – The New College, Madras University, Chennai, India.

## Professional Employment –Positions held

2015- present **University Research fellow** – Department of Infectious Diseases and Immunology, Sydney Medical School, The University of Sydney, Australia.

**Research topic** – *Developing novel approaches to inhibit pyocyanin binding to extracellular DNA to inhibit P. aeruginosa biofilm formation.*

2011- 2014 **Postdoctoral scientist** – School of Biotechnology and Biomolecular Sciences (BABS), The University of New South Wales, Sydney, Australia.

**Research topic** – *Elucidating the interaction between electroactive metabolites and extracellular DNA in bacterial biofilm formation.*

2006 – 2007 **Research assistant** – Electrochemistry Lab, Department of Chemistry, Indian institute of Technology –B(IITB), Mumbai, India.

**Research topic** – *Electroplating of copper on silicon wafer - used for solar cells*  
Project funded by Applied materials (AMAT), USA.

2006 **Research assistant** – Nanotechnology Research Institute, Curtin University of Technology, Perth, Western Australia, Australia.

**Research topic** – *Interaction of porous nanoparticle with hydrophobic and hydrophilic surfaces using atomic force microscopy*

Project funded by Noritake Company LTD, Japan.

2005 – 2006 **Laboratory Demonstrator** - School of Applied Chemistry, Curtin University of Technology, Perth, Western Australia, Australia.

**Role** – *Lab demonstrator for 1<sup>st</sup> year bachelor chemistry students*

2003 – 2005 **Processing officer** – e-Serve Int. LTD, Citibank, Chennai, India.

**Role**- *Application processing for european merchants*

## Research funding

\$310,000 - University of Sydney Postdoctoral Research Fellowship (2015-2017)  
\$84,000 - Commercial Development and Industry Partnerships grant (CDIP) (2018)  
\$2500 - University of Sydney Early Career Researcher Overseas Travel Grant (2015)  
\$1500 - Yvonne Cossart Travel Award (2017)

## Conference Awards and other prizes

2011 Best oral presentation award at 2011 MRS Spring meeting, Sanfrancisco, USA  
2010 Best oral presentation award at 2010 Kolff days, Netherlands  
2009 Best oral & poster (combo) presentation award at 2009 Kolff days, Netherlands  
2007-2011 **Ubbo Emminus PhD scholarship**, University of Groningen, Netherlands  
2003 **First ranked in bachelor of Chemistry**, Madras university, India  
2002 Top student hindi scholarship, Madras university, India

## Patent

1. **Theerthankar Das**, Jim Manos, Whiteley Gregory Stuart and Glasbey Trevor Owen  
Title: "Biofilm disrupting composition"  
Provisional patent (2016905326:22-12-16) filled with an industry partner (Whiteley Corporation).

## Peer-reviewed publications

### *Book Chapters*

1. **Theerthankar Das** and Jim Manos.  
*Pseudomonas aeruginosa* extracellular secreted molecules have a dominant role in biofilm development and bacterial virulence in cystic fibrosis lung infections.  
**Book Name:** Progress in Understanding Cystic Fibrosis. *InTech open*; **2017**. [Citations =0]
2. **Theerthankar Das**, Amaye I Ibugo and M. Manefield.  
Role of Pyocyanin and eDNA in Facilitating *Pseudomonas aeruginosa* Biofilm Formation.  
**Book Name:** Microbial Biofilms-Applications and importance; *InTech open*; **2016**. [Citations =2]
3. **Theerthankar Das**, Onder Kiyome and M. Manefield.  
Bacterial biofilms on wounds a major factor delays wound healing and a potential threat to human life and economy.  
**Book Name:** Recent Clinical Techniques, Results, and Research in Wounds. *Springer*; 2018.

### *Journal articles*

1. **Theerthankar Das**, Martin Simone, Amaye Ibugo, Paul Witting, Mike Manefield and Jim Manos.  
Glutathione enhances antibiotic efficiency and effectiveness of DNase I in disrupting *Pseudomonas aeruginosa* biofilms while also inhibiting pyocyanin activity, thus facilitating restoration of cell enzymatic activity, confluence and viability. *Frontiers in Microbiology*, 8: 2429, **2017**. [Citations =0]
2. Seiji Yamaguchi, Shekhar Nath, Yoko Sugawara, Kamini Divakarla, **Theerthankar Das**, Jim Manos, Wojciech Chrzanowski \*, Tomiharu Matsushita, Tadashi Kokubo.  
Two-in-One Biointerfaces—Antimicrobial and Bioactive Nanoporous Gallium Titanate Layers for Titanium Implants. *Nanomaterials*, 7: 229, **2017**. [Citations =0]

3. Onder Kiyome, **Theerthankar Das**, Amaye I Ibugo, Naresh Kumar and M. Manefield.  
Serratia secondary metabolite prodigiosin inhibit Pseudomonas aeruginosa biofilm development by producing reactive oxygen species that damage biological molecules. *Frontiers in Microbiology*, 7:972, **2016**. [Citations = 5]
4. William Klare, **Theerthankar Das**, Amaye I Ibugo, M. Manefield and Jim Manos.  
The glutathione-disrupted biofilm of clinical *P. aeruginosa* strains: enhanced antibiotic effect and a novel biofilm transcriptome. *Antimicrobial Agents and Chemotherapy*, 60: 4539-4551, **2016**. [Citations = 2]
5. Shama Sehar, Iffat Naz, **Theerthankar Das** and Safia Ahmed.  
Evidence of microscopic correlation between biofilm kinetics and divalent cations for enhanced wastewater treatment efficiency. *RSC Advances*, 6, 15112-15120, **2016**. [Citations = 4]
6. **Theerthankar Das**, SK. Kutty, R.Tavallaie, AI. Ibugo, J. Panchompoo, S. Sehar, et al.  
Phenazine virulence factor binding to extracellular DNA is important for Pseudomonas aeruginosa biofilm formation. *Nature Scientific reports* 5, 8398, **2015**. [Citations = 27]
7. **Theerthankar Das**, S. Sehar, L. Koop, Y-K Wong, S. Ahmed, et al.  
Influence of calcium in extracellular DNA mediated bacterial aggregation and biofilm formation. *PLOS ONE*, 9, e91935, **2014**. [Citations = 37]
8. H. Chong, C. Marjo, **Theerthankar Das**, A. Rich and M. Manefield.  
Surface Analysis Reveals Biogenic Oxidation of Sub-bituminous Coal by *Pseudomonas fluorescens* *Applied Microbiology and Biotechnology*, 98:6443-6452, **2014**. [Citations =5]
9. Y. Adnan, C. Dewei, L-C. Ming, **Theerthankar Das**; S. Sehar, M. Manefield, and L. Sean. Interface Thermodynamic State-induced High-Performance Memristors. *Langmuir*, 30, 1183-1189, **2014**. [Citations = 10]
10. **Theerthankar Das**, S. Sehar and M. Manefield.  
The roles of extracellular DNA in the structural integrity of EPS and bacterial biofilm. *Environmental Microbiology Reports*, 5, 778-786, **2013**. [Citations = 59]
11. **Theerthankar Das** , S.K. Kutty, N. Kumar and M. Manefield.  
Pyocyanin facilitates extracellular DNA binding in *Pseudomonas aeruginosa* influencing its cell surface properties and aggregation. *PLOS ONE*, 8, e58299, **2013**. **Featured as key scientific article in "Global medical discovery"** [Citations = 46]
12. \*J.J.T.M. Swartjes, \***Theerthankar Das**, S. Sharifi, G. Subiahdoss, P.K. Sharma, et al.  
A functional DNase I coating to prevent adhesion of bacteria and the formation of biofilm. *Advanced Functional Materials*, 23, **2013**. (\***Joint 1<sup>st</sup> authors**). [Citations = 52]
13. **Theerthankar Das** and M. Manefield.  
Phenazine production enhances extracellular DNA release via hydrogen peroxide generation in *Pseudomonas aeruginosa*. *Communicative & Integrative Biology*, 6, e23570, **2013**. [Citations = 14]
14. **Theerthankar Das** and M. Manefield.  
Pyocyanin promotes release of extracellular DNA in *Pseudomonas aeruginosa*. *PLOS ONE*, 7, e46718, **2012**. [Citations = 79]
15. **Theerthankar Das**, P. K. Sharma, B. P. Krom, H. C. van der Mei, and H. J. Busscher.  
Role of eDNA on the adhesion forces between *Streptococcus mutans* and substratum surfaces: influence of ionic strength and substratum hydrophobicity. *Langmuir*, 27, 10113-10118, **2011**. [Citations =40]

- 16. Theerthankar Das**, B. P. Krom, H. C. van der Mei, H. J. Busscher and P. K. Sharma.  
DNA-mediated bacterial aggregation is dictated by acid-base interactions.  
*Soft Matter*, 7, 2927-2935, **2011**. [Citations =33]
- 17. Theerthankar Das**, P. K. Sharma, H. J. Busscher, H. C. van der Mei and B. P. Krom.  
Role of extracellular DNA in initial bacterial adhesion and surface aggregation  
*Applied Environmental Microbiology*, 76, 3405-3408, **2010**. [Citations =156]
- 18. Theerthankar Das**, T. Becker and B. N. Nair.  
Measurements on hydrophobic and hydrophilic surfaces using a porous gamma alumina nanoparticle aggregate mounted on Atomic Force Microscopy cantilevers.  
*Thin Solid Films*, 518, 2769-2774, **2009**. [Citations =4]
- 19. Theerthankar Das** and S. I. Bailey.  
Cyclic voltammetry investigation of redox mechanism of copper in aqueous sodium hydroxide.  
*Bulletin of Electrochemistry*, 23, 175-181, **2007**. [Citations =0]

### Invited talks/seminar

2016	Oral presentation	Faculty of Pharmacy, University of Sydney April 2016, Sydney, Australia.
2014	Oral presentation	Joint Academy of Microbiology Seminar (JAMS)- May 2014, Sydney, Australia.
2013	Oral presentation	Singapore Centre on Environmental Life Sciences Engineering (SCELSE), Nanyang Technological University (NTU)- August 2013, Singapore.

### Oral presentation at conferences

2011	Oral presentation	Material Research Society (MRS) conference-April, San Francisco, USA. ( <b>1<sup>st</sup> prize</b> )
2010	Oral presentation	Kolff days, UMCG, University of Groningen-April, Schiermonnikoog, The Netherlands. ( <b>1<sup>st</sup> prize</b> )
2009	Oral presentation	Kolff days, UMCG, University of Groningen-April, Schiermonnikoog, The Netherlands. ( <b>1<sup>st</sup> prize</b> )
2008	Oral presentation	Thesinge Biofilms meeting-July, Groningen, The Netherlands. ( <b>Best presenter</b> )

### Poster presentation at conferences

2015	Poster presentation	American society of Microbiology, Chicago, USA.
2010	Poster presentation	IV International Biofilms conference-September, Winchester, UK.
2008	Poster presentation	10 <sup>th</sup> International Conference on Ceramic Processing Science-May, Inuyama, Aichi, Japan.

### Supervision and laboratory positions and lecture

**Supervision:** Total 7 students (1 PhD, 2 Mphil, 2 Masters, 1 graduate diploma and 1 honours) – details below:

#### **Current supervision:**

- Dr Das is currently co-supervising (along with Dr. Jim Manos) one Mphil student working on "Effect of antioxidants in disrupting biofilms and kill clinical bacterial strains" at University of Sydney (2016-present).

- Dr Das is currently co-supervising (along with Dr. Jim Manos) one Mphil. student working on "Developing novel combination therapy to disrupt biofilms and facilitate host cell recovery" at The University of Sydney (2016- present).
- Dr Das is currently co-supervising (along with Dr. chrzanowski) one PhD student working on "Determine ability of Gallium nanoparticles in killing multi-drug resistant *Acinetobacter baumannii*" at The University of Sydney (2016- present).
- Dr Das is currently co-supervising (along with Dr. chrzanowski) one Masters student working on "Defensin immobilization on biomedical surfaces to inhibit bacterial adhesion" at The University of Sydney (2016- 2017).
- Dr Das is currently co-supervising (along with Dr. Hien Doung) one Undergraduate Summer project student working on "Nitric oxide releasing molecules in disrupting bacterial biofilms" at The University of Sydney (2017-2018).
- Dr Das is currently co-supervising (along with Prof. Kim Chan) one Postdoctoral researcher working on "Phage combined antibiotics on drug resistant *Pseudomonas aeruginosa* biofilms" at The University of Sydney (2017-2018).

***Past supervision:***

- Dr Das has previously co-supervised (along with Dr. Jim Manos) one honours student worked on "Understanding transcriptome of cystic fibrosis isolates of *Pseudomonas aeruginosa* biofilms" at The University of Sydney (2015).
- Dr Das has previously co-supervised (along with A/Prof. Mike Manefield) one graduate diploma worked on "Role of *P. aeruginosa* extracellular DNA-pyocyanin interaction in biofilm formation" at BABS, UNSW (2012-2014).
- Dr Das has previously co-supervised (along with A/Prof. Mike Manefield) one Master student worked on "Interfering pyocyanin activity using antioxidant to disrupt bacterial biofilms" at BABS, UNSW (2014-2016).

***Laboratory duties:*** Dr Das held lab manager position for PC2 microbiology laboratory, BABS, The UNSW from 2013-2014.

**Teaching experience:** 2016- Lecture on biofilms for Infection and Immunity postgraduate program: Advanced Medical Bacteriology students course (INIM5011)  
 2017- Lecture on biofilms for Infection and Immunity postgraduate program: Advanced Medical Bacteriology students course (INIM5011)  
 2017- Lecture on bacterial biofilm and its implications for "Infection Control and Epidemiology" (INIM5012)  
 2017- Laboratory demonstrator for "Microbiology Medical and Dental practical programs: It's a small world!"  
 2017 - Laboratory demonstrator for Infection and Immunity postgraduate program bacterial biofilm"

**Review of journal articles**

Currently a Reviewer for four high quality journals: *PLOS One*, *Nature Scientific Reports*, *Biofouling* and *The Polish Journal of Microbiology*.