

## Curriculum Vitae

<p>SATHISH KUMAR</p>	<p>Post-doctoral researcher Department of surgery – Urology division Anschutz medical campus – University of Colorado</p>
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### Research Experience and Education

INSTITUTION AND LOCATION	DEGREE	MM/YY	FIELD OF STUDY
Christian Medical College, Vellore-India	B.Sc.	09/2007	Biochemistry/ Microbiology
Institute of Basic Medical Sciences, University of Madras, Chennai-India	M.Sc.	04/2011	Molecular Biology/ Microbiology
Chonbuk National University, South Korea.	Ph.D.	08/2015	Molecular biology

09/2021 – to date	Post-Doctoral Research fellow, University of Colorado, USA
09/2019 – 09/2021	Post-Doctoral Research fellow, University of Maryland, USA
02/2016 – 08/2018	Post-Doctoral Research fellow, Department of Chemical and Bio-molecular engineering, KAIST
08/2012 – 01/2016	Doctoral research - Chonbuk National University, South Korea.
06/2011– 12/2011	Short-term Research Fellow- Christian Medical College, Vellore. Center for Stem Cell Research.
08/2009 – 04/2011	M.Sc. Molecular Biology - University of Madras. Department of Genetics.
11/2007 – 07/2009	Medical Lab Technologist - Scudder Memorial Hospital. Department of Medical Laboratory.
07/2003 – 10/2007	B.Sc. Medical Laboratory Technology - Christian Medical College, Vellore. Department of Transfusion Medicine & Immunohematology.

## A. Honors and awards

- 2007 - Passed BSc Medical Laboratory Technology from Christian medical college. CMC, Vellore is the second-best medical college in India.
- 2011 - MSc Molecular Biology with Distinction from University of Madras.
- 2011 - EMQAL Erasmus Mundus Scholarship wait list no.2
- 2011 - Reviewer in International Journal of Bioscience Research.
- 2012 - DST travel grant Indo- Korea exchange student.
- 2013 - Travel Grant from University Grant Commission to visit Vels University, India.
- 2014 - Secured 100% Tuition fee scholarship from Chonbuk National University.
- 2015 - Doctorate in the field of Space microbiology
- 2016 - Brain Korea 21+ post-doctoral research fellowship from KAIST. KAIST is ranked World's 6<sup>th</sup> most innovative university in 2017 by Reuters.
- 2016 - Best poster award from Korean microgravity society.
- 2017 - Editorial member for EC Microbiology journal.
- 2017 - Editorial member for Journal of Environmental Science and Renewable Energy.
- 2019 - NIH post-doctoral fellowship
- 2021 - Travel grant to Stanford University flow core facility, California.

## B. Language & Proficiency

English: full professional proficiency; IELTS Academics – 7.5, Tamil – Fluent, Korean – Basic.

## C. Skills

Routine tests performed in a clinical laboratory (Hematology/Biochemistry/Microbiology/Blood bank/Histopathology)

Molecular Biology - DNA extraction, Large scale plasmid isolation, Cell culture, Flow cytometry, Confocal microscopy, Animal handling, Ultracentrifuge, PCR, qRT-PCR, Microgravity setup, Electron microscopy (Bio-SEM, FE-SEM & HR-TEM), scRNASeq, Cloning, Co-Immunoprecipitation, Protein expression, Immunostaining, Pulldown assay, Fly genetics, Novaseq,

Microbiological skills – Have worked with variety of microorganisms including Virus, Bacteria, Microalgae and Fungi.

Liquid chromatography coupled mass spectrometry, UV- Vis spectrometry, Nanoparticle synthesis, Characterization & Applications.

Advanced techniques: Multiplex cytokine assays, 30 color flow cytometry, Microbiome-NOVA sequencing, inductively coupled plasma mass spectrometry.

Animal handling: Have maintained 7 genotype murine models. Soft mouse software colony maintenance, breeding setup, have completed all the CITI animal certifications, and able to perform various surgical procedures on the mice like tissue harvest and single cell preparation for molecular analysis.

Conducting practical sessions for students and giving lectures.

#### **D. Research projects**

1. Microalgae lipid accumulation as an alternate source for biodiesel.
2. Bio-engineering of adeno-associated virus serotype (aav) - 2 capsid at serine/threonine residues improves its transduction efficiency both in vitro and in vivo.
3. Antimicrobial properties of Nano fibers.
4. Phenotypic and transcriptomic analysis of fungi under microgravity.
5. Surface engineering of nanoparticles for biomedical applications.
6. Metal enhanced fluorescence for cell imaging.
7. Drosophila as a model for various genetic interaction studies.
8. Changes in the oral microbiome of IRF8 knockout mice model.
9. Osteoclast genesis in IRF8 knockout mice.
10. Cell signaling during Influenza A viral infection
11. (Current) neuron-glia interactions in bladder sensory nervous system in health and diseases

#### **E. International conference publications**

1. Abstract accepted for poster presentation at the American Society of Hematology, annual meeting, Georgia, USA, 2012. Dwaipayan Sen, Nishanth Gabriel, Yesupatham Sathish Kumar, Rekha Samuel, Alok Srivastava, Giridhara R Jayandharan. Targeted modifications in adeno-associated virus serotype (AAV) - 8 capsid improves its hepatic gene transfer efficiency in vivo.
2. Abstract accepted for poster presentation at the American Society of Gene and Cell Therapy, Utah, USA, 2013. Dwaipayan Sen, Rupali A Gadkari, Govindarajan Sudha, Nishanth Gabriel, Yesupatham Sathish Kumar, Ruchita Selot, Rekha Samuel, Ramya. V, Sukesh Nair, Narayanaswamy Srinivasan, Alok Srivastava, Giridhara R Jayandharan. A novel adeno-associated virus serotype (AAV) - 8 vector improves human coagulation factor IX expression in vivo.
3. Abstract accepted for oral presentation at the International Society on Thrombosis and Haemostasis Congress Liverpool, UK, 2012. Dwaipayan Sen, Aaron Chapla, Noel Walters, Viju Daniel, Yesupatham Sathish Kumar, Alok Srivastava and Giridhara R Jayandharan. Nuclear Factor (NF)- $\kappa$ B is a major regulator of blood induced joint damage in a mouse model of hemophilia A
4. Abstract accepted for poster presentation at the Asian Mycological Congress, Beijing, China, 2013. Yesupatham Sathishkumar, Natarajan Velmurugan, Duraisamy Kalpana, Kalyanaraman Rajagopal Im Chan Ki, Yang Soo Lee. Effect of simulated microgravity on phenotype and central metabolism of *Aspergillus niger*

5. Abstract accepted for poster presentation at the Asian Mycological Congress, Beijing, China, 2013. Yesupatham Sathish kumar, Natarajan Velmurugan, Duraisamy Kalpana, Kalyanaraman Rajagopal, Im Chan Ki, Yang Soo Lee. Intracellular changes and differential expression of *gfaA* in *Penicillium chrysogenum* under simulated microgravity condition.
6. Abstract accepted for poster presentation at the International Union of Microbiological Societies, Montreal, Canada, 2014. Yesupatham sathish kumar, Afeesh Unnithan, Cheo sang kim, Yang soo lee. Antibacterial activity and characterization of electrospun nanofiber of low shear modeled microgravity grown culture filtrate of *Penicillium chrysogenum*.
7. Abstract accepted for poster presentation at the International meeting of the microbiological society of Korea, Gwanju, South Korea, 2016. Yesupatham Sathish kumar, Kesavan Devarayan, Byoung-Sukh Kim and Yang Soo Lee. Fungistatic Activity of  $\alpha$ -Aminophosphonate Chitosan derivative against *Aspergillus niger* in Controlled Microgravity.

#### **F. Peer-reviewed publications (Gross Impact factor – 88.5, Citations - 835+)**

1. **Yesupatham Sathishkumar**, Natarajan Velmurugan, Hyun Mi Lee, Kalyanaraman Rajagopal, Chan Ki Im, Yang Soo Lee\*. "Effect of low shear modeled microgravity on phenotypic and central chitin metabolism in the filamentous fungi *Aspergillus niger* and *Penicillium chrysogenum*", *Antonie Van Leeuwenhoek*, **106**, 197-209 (2014.08.01) (ISSN: 1572-9699; Impact factor: 2.7)
2. Natarajan Velmurugan, **Yesupatham Sathishkumar**, Sung Sun Yim, Yang Soo, Lee Mi Park, Ji Won Yang Ki Jun Jeong\* "Study of cellular development and intracellular lipid bodies accumulation in the thraustochytrid *Aurantiochytrium* sp. KRS101". *Bio resource Technology*, 161, 149-154 (2014.06.30) (ISSN: 0960-8524; Impact factor: 9.6)
3. Kesavan dev, **Yesupatham Sathishkumar\***, Yang Soo Lee, Byoung-Sukh Kim\*. "Fungistatic Chitosan derivative for Astronauts in Microgravity". *Plos One*, **10(10): e0139303** (2015.10.15) (ISSN: e19326203; Impact factor: 3.2)

4. **Yesupatham Sathishkumar**, kesavan Dev, Im Chan Ki, Kalyanaraman Rajagopal, Yang Soo Lee\*. "Green synthesis of silver nanoparticles using *Mucor circinelloides*". *Materials Letters*, **159**, 481– 483 (2015.11.15) (ISSN: 0167-577X; Impact factor: 3.4)
5. **Yesupatham Sathish Kumar**, Afeesh Rajan Unnithan, Dwaipayan Sen, Cheol Sang Kim, Yang Soo Lee\*. "Microgravity Biosynthesized Penicillin Loaded Electrospun Polyurethane-Dextran Nanofibrous Mats for Biomedical Applications". *Colloids & Surfaces A: Physicochemical and Engineering Aspects*, **477**, 77-83 (2015.07.20) (ISSN: 0927-7757; Impact factor: 4.5)
6. **Yesupatham Sathishkumar**, Kalyanaraman Rajagopal, Yang Soo Lee\*. "High throughput *denovo* RNA sequencing elucidates novel responses of *Penicillium chrysogenum* to microgravity". *Bioprocess and Biosystems Engineering*, **38**, 1-9 (2015.11.24) (ISSN: 1615-7591; Impact factor: 3.2)
7. J salamon, **Yesupatham Sathishkumar**, K ramachandraan, Yang soo lee, Dong Jin Yoo, Ae Rhan Kim, G Gnana kumar\*. "One-pot synthesis of magnetite nanorods/graphene composites and its catalytic activity toward electrochemical detection of dopamine". *Biosensors and Bioelectronics*, **64**, 269-276 (2015.02.15) (ISSN: 0956-5663; Impact factor: 10.2)
8. M. Ranjani, **Yesupatham Sathish Kumar**, Yang Soo Lee, Dong Jin Yoo, Ae Rhan Kim, G.Gnana kumar\*. "Ni Co alloy nanostructures anchored mesoporous silica nanoparticles for the non-enzymatic glucose sensor applications". *RSC Advances*, **5**, 57804-57814 (2015.07.02) (ISSN: 2046-2069; Impact factor: 3.3)
9. Sen D, Gadara RA, Sudha G, Gabriel N, **Yesupatham Sathishkumar**, Selot R, Samuel R, Rajalingam S, Ramya V, Nair SC, Srinivasan N, Srivastava A, Jayandharan GR\*. "Targeted modifications in adeno-associated virus (AAV) serotype -8 capsid improves its hepatic gene transfer efficiency *in vivo*". *Human Gene Therapy Methods*, **24**, 2 (ISSN: 1043-0342; Impact factor: 5.6) (2013.02.25)
10. Afeesh Unnithan, Gopalsamy Gnanasekaran, **Yesupatham Sathishkumar**, Yang Soo Lee, Cheol Sang Kim\*. "Electrospun antibacterial polyurethane–cellulose acetate–zein Composite mats for wound dressing". *Carbohydrate polymers*, **102**, 884-892 (2014.02.15) (ISSN: 0144-8617; Impact factor: 9.3)
11. Afeesh Rajan Unnithan, Arathyram Ramachandra Kurup Sasikala, **Yesupatham Sathishkumar** Yang Soo Lee, Chan Hee Park, Cheol Sang Kim\*. "Nanoceria doped electrospun antibacterial composite mats for potential biomedical applications". *Ceramics international*, **40**, 12003-12012 (2014.09.30) (ISSN: 0272-8842; Impact factor: 4.5)

12. K. Ramachandran, D. Kalpana, **Yesupatham Sathishkumar**, Yang Soo Lee\*, G.Gnana kumar\*. "A facile green synthesis of silver nanoparticles using P.betel biomass and its catalytic activity towards sensitive and selective nitrite detection". *Journal of Industrial & Engineering Chemistry Research*. **35**, 29-35 (2016.03.25) (ISSN: 1226-086X; Impact factor: 3.7)
13. C Karthikeyan, **Yesupatham Sathishkumar**, Yang Soo Lee, Ae Rhan Kim, Dong Jin Yoo. The Influence of Chitosan Substrate and Its Nanometric Form toward the Green Power Generation in Sediment Microbial Fuel Cell. *Journal of Nanoscience and Nanotechnology* **17**, 558-563 (2017.03.10) (ISSN: 1533-4880; Impact factor: 1.1)
14. C, Karthikeyan; Chandran, Rama; Sheet, Sunirmal; Yoo, Dong Jin; **Yesupatham Sathishkumar** , Lee, Yang Soo; Kim, Ae Rhan; Gnana Kumar, G. Pigeon excreta mediated synthesis of rGO/CuFe<sub>2</sub>O<sub>4</sub> nanocomposite and its catalytic activity toward sensitive and selective hydrogen peroxide detection. *ACS sustainable Chemistry & Engineering*, **5**, 4897- 4905 (2017.04.13) (ISSN: 2168-0485; Impact factor : 8.1)
15. Sunirmal Sheet, **Yesupatham Sathishkumar**, Allur Subramaniyam Siva Kumar, Kwan Seob Shim, Yang Soo Lee. Low-shear-modeled microgravity-grown *Penicillium chrysogenum*-mediated biosynthesis of silver nanoparticles with enhanced antimicrobial activity and its anticancer effect in human liver cancer and fibroblast cells. *Biosystems and Bioengineering*, **40**, 1529–1542 (2017.07.14) (ISSN: 1615-7591; Impact factor: 3.2)
16. **Yesupatham Sathish Kumar**, Sunirmal Sheet and Yang Soo Lee. Applications of simulated microgravity conditions in space microbiology. *International journal of environmental science and natural resources*, **2**, 555582 (2017.03.31) (ISSN: 2572-1119; Invited review paper)
17. Li Pei, **Yesupatham Sathish Kumar**, Hyun Gyu Park\*. Development of a rapid and simple tetracycline detection system based on metal-enhanced fluorescence by europium-doped AgNP@SiO<sub>2</sub> core-shell nanoparticles. *RSC advances*, **8**, 24322-24327 (2018.07.05) (ISSN 2046-2069; Impact factor: 3.3)
18. Sunirmal Sheet, **Yesupatham Sathishkumar**, Yang-Soo Lee. Insight into *Pseudomonas aeruginosa* pyocyanin production under low-shear modeled microgravity. *Bioprocess and Biosystems Engineering*, (2018.10.25) (ISSN: 1615-7591; Impact factor: 3.2)
19. Sunirmal Sheet , **Yesupatham Sathishkumar** , G. Gnana kumar. Titania/reduced graphene oxide composite nanofibers for the direct extraction of photosynthetic electrons from microalgae for biophotovoltaic cell applications. *Applied Physics A* (2018.11.05) (ISSN: 0947-8396; Impact factor: 2.5)

20. Sunirmal Sheet, **Yesupatham Sathish Kumar**, Kuntal Ghosh, Yang Soo Lee. Modulatory effect of Low-Shear Modeled Microgravity on Stress Response, Membrane Fatty Acid Composition, Virulence allied character and relevant gene expressions of food-borne pathogen *Listeria monocytogens*. *Enzyme and microbial technology*. (ISSN: 01410229 Impact factor: 3.4) (2020.02.10)
21. PiramanayagamParamanantham, G.SivabAsadSyedAbdallah,M.ElgorbancM,AdamGanibAli, H.Bahkali, RavichandranKandaswamy, P.Muthupandi, **Y. SathishKumar**, G. Gnanakumar. Sulfonated PVdF-HFP/shuttle-like SrBaWO<sub>4</sub> nanocomposite membranes for the evolution of high performance and durable DMFC. *solid State Ionics* (ISSN:0167-2738 Impact factor: 3.7) (2021.10.10)
22. Amitabh Das, **Yesupatham Sathish Kumar**, Brian Foster, Keiko Ozato, Vivek Thumbigere Math. Shift in the oral microbiome of IRF8 knock out mice during periodontitis. (Manuscript under preparation)
23. Amitabh Das, **Yesupatham Sathish Kumar**, Brian Foster, Keiko Ozato, Vivek Thumbigere Math. Osteoclastogenesis and root resorption in the IRF8 gene knock out mice. (Manuscript under preparation)

**G. Ph.D. thesis title**

**“The phenotypic and transcriptomic analysis of *Penicillium chrysogenum* and *Aspergillus niger* in response to low shear modeled microgravity”**