Dr. ARAVIND KUMAR RENGAN

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DoB : 9th Aug 1983

Lab website : www.pnaslab.com

EDUCATION

Degree	University	Year	CGPA/%
Ph.D. -BME	IIT Bombay, Powai, Mumbai	2015	**9.63/10** **(Best Thesis Award)**
M. Tech Nanomedicine	Amrita Centre for Nanosciences and Molecular Medicine	2010	**9.39/10** **(University Rank)**
M.B.B.S	Thanjavur Govt. Medical College	2007	**First Class**
Intermediate/+2	Tamilnadu State Board	2001	**95.25**
Matriculation/10th	Tamilnadu Matric Board	1999	**91.72**

Professional Experience

Position	University/ Institution	Dates
Associate Professor	IIT Hyderabad	Oct 13th 2021 - Till Date

Assistant Professor	IIT Hyderabad	Aug 12th 2015 – Oct 11th 2021
Research Associate	IIT Bombay	Nov 1st 2014-July 31st 2015
Teaching Assistant under Project	IIT Bombay	May 1st 2013-Oct 31st 2014
Institute Teaching Assistant	IIT Bombay	July 15th 2010-April 30th 2013
CRRI (House Surgeon)	Thanjavur medical college	Mar 31 2006 –Mar 30th 2007

AWARDS /HONOURS/FELLOWSHIPS

- **G D Naidu Young Scientist Award 2023 – Plaque + 1 lakh cash prize.**
- **MERK - Young Scientist Award 2023 – Biological Sciences-Runner up - Plaque + 1 lakh cash prize.**
- **SERB SIRE Fellowship to visit University of Alberta – Dept of Radiation Oncology 2022-23.**
- **DST SERB – PAC co - opted member in Biomedical Health Sciences (2022 onwards).**
- **Selected to the BRICS - Young Scientist Forum 2021 (One among 5 scientists representing India in the Healthcare Domain)**
- **INDIAN NATIONAL ACADEMY OF ENGINEERING (INAE) – Young Engineer Awardee 2018 - Certificate + Cash award. Inducted into INAE as Young Associate till 2028.**
- **Selected for INDIAN NATIONAL YOUNG ACADEMY OF SCIENCE (INYAS) Membership, 2020-2024.**
- **NATIONAL ACADEMY OF SCIENCE (NASI) – Young Scientist Awardee 2018 - Medal+ Certificate + Cash award**
- **INDIAN NATIONAL SCIENCE ACADEMY (INSA) – Young Scientist Awardee 2017- Medal + Certificate + Startup Grant**
- **Student team selected for President of India "Innovation Scholars In-Residence Program" for "Affordable kit for detection of Cervical Cancer"**
- **DBT- BIRAC- Gandhian Young Technology Innovation Award 2017 – Certificate + Grant.**

- **INNOVATIVE YOUNG BIOTECHNOLOGIST AWARD IYBA (2015-16) presented by GOVERNMENT OF INDIA - DBT.**
- **DST INSPIRE FACULTY AWARD 2015 – (BIOMEDICAL).**
- **University Rank Holder** in M.Tech Nanomedicine **(Merit certificate + Medal).**
- **Gandhian Young Technology Innovation Award Winner 2015** – Presented at President's House, Rastrapathi Bhavan (Festival of Innovation 2015) – March 8th 2015.
- **IIT Bombay Institute's Award for Excellence in PhD -** (2014-16) - **Cash Prize and Merit Certificate**
- **Lion Pushpa Somaiya Student Award 2015 – Cash Prize and Trophy**
- **IRCC - Infosys Fellowship - "OraNano C (Oral Cancer therapeutics)" project** (2014- 2015).
- **Bill and Melinda Gates Fellowship** -"TB NANODOTS" project – **served as Co-investigator/project in-charge with a fellowship** (2013-2014)**.**
- IIT B Teaching Assistant – **Institute fellowship** (2010-2013).
- **DST fellowship** for Master of Nanomedical Sciences (2008-2010)
- **DBT-IITB travel award** to visit UK for oral presentation in 2012, IEEE NANO.
- **IKP-GCE travel award** to visit Brazil for poster presentation in 2013, GCE- Annual meet, Rio, Brazil.
- **Top 100 winner of ICONSAT 2014** poster presentation (**Top 15** under nanomedicine category).
- **Top 16 winner of Travel grant award** "Nanomed Engineering Workshop" **AIIMS Delhi** organized by Indo US Science and Technology Form **(IUSSTF)**.
- **Best Poster Award**, Indo-US Nanoengineering in Medicine Conference, AIIMS Delhi, Dec 2014.
- **Best Paper - Bajpai Saha Award,** Society for Biomaterials and Artificial Organs, **BiTERM** conference, Anna University – Chennai, Feb,2015.
- **Best Poster Award-** International Symposium on Nanotechnology and Cancer Theranostics - **ISNACT** –IIT Bombay, Feb 2015.
- **Best Oral Presentation –** In House Symposium, Dept. of Biosciences and Bioengineering, RESCON, IIT Bombay, March 2015.
- **Best Poster Award – SymPhy2015, IIT Bombay.**
- **Best Poster Award – GE IDEA/Research Poster contest, 2015.**
- **Obtained "STAR PERFORMER – GOLD CERTIFICATE" from TOEFL, ETS org. for**

scoring above 27/30 in each section of TOEFL iBT and above 110/120 overall.

- Cleared the Tamilnadu state entrance in 2001 to obtain merit seat for MBBS studies.
- One among 15 medical doctors who cleared **MMST** (masters in medical science and technology) entrance in 2008 conducted by IIT-Kharagpur.

Research Interests and Expertise (up to five keywords): Cancer nanotechnology, Photothermal therapy, Triggered drug delivery, Biomaterials, Nanotoxicology, Anti-Microbial Resistance (AMR) and Theranostics

Research Contribution Statistics:

ORCID ID: 0000-0003-3994-6760; Scopus Author Identifier: 55485470900

Description	Number	Description	Number
Journals publications	85	Books	0
First/Corresponding author	70	Book chapters	12
Total citation	2280	Patents - Published	25
h-index	24	Patents - Granted	7
i10-index	53	Conference abstracts/papers	14
Cumulative impact factor	~ 250	Total extramural funding as PI (Lakhs)	~ 1100

*Citation/h-index/ i10-index Source: Google Scholar

Google Scholar Link : https://scholar.google.com/citations?user=ZmdNV6UAAAAJ

Research Summary

Dr. Aravind Kumar Rengan is the Principal Investigator heading the nanotoxicology research group at P-NAS (Plasmonic NAnoSpace) laboratory, Indian Institute of Technology, Hyderabad. **He has more than 10 years of experience in the field of nanotechnology and biomaterials and have made contribution in the area of cancer nanotheranostics**. The lab's focus is on the development of nano theranostics for biomedical application (esp cancer). Our current research has the potential to create a significant impact in the development of next-generation, translational theranostic technologies. In this perspective, the current focus of Dr. Rengan's research is on development of various biodegradable nanosystems for targeted cancer and anti-microbial theranostics. Several nanoformulations have been developed, tested for its efficacy and the results have been reported in various peer-reviewed journals such as Materials Today -NANO, ACS Materials Letters, Langmuir, ACS Applied Materials & Interfaces, RSC Nanoscale, RSC Biomaterial Sciences, ACS Nano letters, ACS Macroletters etc. The lab has produced several meritorious PhD graduates. Several patents have been filed on the technologies developed in his lab including 2 US patents.(7 patents have been granted till date, including 1 US patent)

PATENTS

Indian Patents

- Bioinspired gold coated phage nanosomes and methods of preparation therefor **IPA No.202341013944**
- High Affinity oligonucleotide nano-matrix and a nanocarrier system **IPA No. 202341006125**
- Encapsulated nano-formulations of Buparvaquone and methods of preparation therefor - **IPA No. E-1/71710/2022-CHE .**
- Composition for prevention, treatment and management of mucositis **IPA No. 202221054707 (Granted)**
- A multimodal liposomal composition for Naja Naja Venom neutralization and a method for producing the same - **IPA No. 202241024566.**
- Plant derived fluorescent nanoparticles for treatment of cancer- **IPA No. 201941030649**.
- Ferroelectric polymer (β-pvdf) for control and mitigation of Microbes under small voltage signals - **IPA No. 202041050666**.
- Hybrid polymeric nanoformulation for the treatment and management of Retinoblastoma **IPA No. 2141/CHE/2020**
- Fluorescent Polymeric NPs as imaging probe- **IPA No. 032865/CHE/2018 (Granted)**
- Liposomal nanoformulation for treatment of cancer **IPA No. 35668 /CHE/2018**
- A detection kit for the diagnosis of cervical cancer by quantification of visual inspection of acetic acid **IPA No. 016604/CHE/2018. (Granted)**
- Liponion as a multi-colour fluorescent biolabelling probe. **IPA No. 2368/Mum/2015**. **(Granted)**
- Enzymatically degradable Lipos Au Nanoparticles for Cancer Theranostics - **IPA No. 4910/MUM/2015**. **(Granted)**
- Photo-disintegrable metal nanoshells for multimodal imaging and passively targeted photothermal therapy of cancer - **IPA No. 4082/Mum/2015**.**(Granted)**
- Modified PEG-400 (mPEG-AA complex) and uses thereof. **IPA No. 4134/CHE/2021(Granted)**
- Thermosensitive hydrogel for cancer therapeutics and methods preparation thereof - **IPA No. 23367/CHE/2020**
- Worldwide patent, PCT Application No. **PCT/IN2016/000296** - Claiming priority from **IPA No.**

4910/MUM/2015.

US Patents

- Modified PEG-400 (mPEG-AA complex) and uses thereof - **USP No.: 17403964**
- Thermosensitive hydrogel for cancer therapeutics and methods preparation thereof - **USP No.: 17325290 (Granted)**

REVIEW ARTICLES

- SA Chinchulkar, P Patra, D Dehariya, A Yu, **AK Rengan***, Polydopamine nanocomposites and their biomedical applications: A review, Polymers for Advanced Technologies, (2022) 10.1002/pat.5863.
- Pratyusha Sambangi, Subramaniam Gopalakrishnan, Monika Pebam & **A.K. Rengan*** , Nano-biofertilizers on soil health, chemistry, and microbial community: benefits and risks, Proceedings of the Indian National Science Academy volume 88, pages 357–368 (2022)
- NP Koyande, R Srivastava, A Padmakumar, **AK Rengan***, Advances in Nanotechnology for Cancer Immunoprevention and Immunotherapy: A Review, Vaccines 10 (10), 1727 (2022).
- A. Padmakumar, N. P. Koyande, & **A. K. Rengan*,** Role of hitchhiking on cancer therapeutics, Advanced Therapeutics (2022) 10.1002/adtp.202200042.
- N. Koyande, M. Gangopadhyay, S. Thatikonda, **A. K. Rengan***, The role of gut microbiota in the development of colorectal cancer: a review, International Journal of Colorectal Disease (2022) 37, pages1509–1523.
- S. Khatun, T. Appidi, **A.K. Rengan***, The role played by bacterial infections in the onset and metastasisof cancer, Curr. Res. Microb. Sci. 2 (2021) 100078.
- S.P. Singh, T. Appidi, **A.K. Rengan***, Biodegradable/disintegrable nanohybrids for photothermal theranostics, Proc. Indian Natl. Sci. Acad. 87 (2021) 94–106.
- A. Hak, V. Ravasaheb Shinde, **A.K. Rengan***, A review of advanced nanoformulations in phototherapy for cancer therapeutics, Photodiagnosis Photodyn. Ther. 33 (2021) 102205.
- A.M. Thanekar, S.A. Sankaranarayanan, **A.K. Rengan***, Role of nano-sensitizers in radiation therapy of metastatic tumors, Cancer Treat. Res. Commun. 26 (2021) 100303.
- G. Ravichandran, **A.K. Rengan***, Aptamer-mediated nanotheranostics for cancer treatment: A review, ACS Appl. Nano Mater. 3 (2020) 9542–9559.
- G. Darabdhara, M.R. Das*, S.P. Singh, **A.K. Rengan***, S. Szunerits, R. Boukherroub, Ag and Au nanoparticles/reduced graphene oxide composite materials: Synthesis and application in diagnostics and therapeutics, Adv. Colloid Interface Sci. 271 (2019) 101991.

- P. Yadav, S.P. Singh, A.K. Rengan, A. Shanavas, R. Srivastava*, Gold laced bio-macromolecules for theranostic application, Int. J. Biol. Macromol. 110 (2018) 39–53.

BOOK CHAPTERS

- T. Appidi, S. Mudigunda, A.K. Rengan* (2022) Cellulose Nanocrystals, Springer.
- T. Appidi, S. Mudigunda, A.K. Rengan* (2022) Multi-Organs-on-a-Chip in Disease Modelling, Springer.
- Sankaranarayanan S.A., Singh S.P., A.K. Rengan*. (2022) Theranostics: Principles, Materials, and Technical Advancements - BioSensing, Theranostics, and Medical Devices, Springer.
- J.K.Gangasani, D.B.Pemmaraju, USN Murthy, A.K. Rengan, VGM Naidu* (2022) Chemistry of herbal biomolecules: Herbal Biomolecules in Healthcare Applications, Academic Press
- D.B.Pemmaraju, A.Ghosh, J.K.Gangasani, USN Murthy, VGM Naidu, A.K.Rengan* (2022) Herbal biomolecules as nutraceuticals: Herbal Biomolecules in Healthcare Applications, Academic Press
- SP Singh, AK Rengan* (2021) Microbial Interactions at Nanobiotechnology Interfaces: Molecular Mechanisms and Applications - Molecular Mechanisms Behind Nano-Cancer Therapeutics, John Wiley & Sons, Inc.
- S.P. Singh, A.K. Rengan* (2019) Nanomaterials for Antibiofilm Activity, Introd. to Biofilm Eng. Part 6 - Nanomater. Antibiofilm Act

Dr. ARAVIND's RESEARCH WORK IN THE NEWS

- "Self-Test for Cervical Cancer" The Hindu, dated Nov 4th 2017. http://www.thehindu.com/sci-tech/health/a-self-test-for-cervical-cancer/article19982985.ece

- "Plant extract with NIR dye for photothermal therapy of Skin Cancer" – The Hindu, dated Oct 21 2017. http://www.thehindu.com/sci-tech/science/iit-teams-use-plant-extract- heat-to-kill-skin-cancer-cells/article19896355.ece

- "Brachistochrone: A metaphor for life and science" Indiabioscience Interview dated March 7th, 2017. https://indiabioscience.org/columns/indiabioscience-blog/brachistochrone-a- metaphor-for-life-and-science

- "Nano Biologist Hyderabad IIT wins IYBA Award" Biostandups Interview dated Nov 17th, 2016. http://www.biostandups.com/interview-series/nano-biologist-hyderabad-iit- wins-iyba-award-2015-interview-series/
- "Medical graduate who chose research and won awards" India Medical Times interview dated Sep 13th, 2016." http://www.indiamedicaltimes.com/2016/09/13/interview-dr- aravind-rengan-

a-medical-graduate-who-went-into-research-and-won-awards/

- *In Vivo* Research work mentioned in Nature Index 2015. (Nature Index tracks top quality research work across the world)

- "Innovation in Cancer Therapeutic NDTV interview" dated Jan 24th, 2015. http://www.ndtv.com/video/player/ndtv-special-ndtv-india/health4u-how-to-fight-cancer/353803 (between 10.40 to 13.30 mins).

- IITB 's LipoAu Nanoparticles for Cancer therapeutics "The Indian Express" dated – 7th Sep,2014 . http://epaper.indianexpress.com/c/3447102

- "Healing touch of gold" – IIT Bombay's official website showcases our research work. http://www.iitb.ac.in/en/research-highlight/healing-touch-gold

- TB Nanodots work (Bill Gates fellowship) "Hindustan Times" dated – June 09, 2013. http://www.hindustantimes.com/mumbai/iit-b-making-tb-patch-that-works-with-sunlight/article1-1073345.aspx