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St. JOSEPH'S COLLEGE OF ENGINEERING

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OMR, CHENNAI - 119

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BIO VOICE

DEPARTMENT OF BIOTECHNOLOGY

NEWSLETTER

April 2026

About Us

The Biotechnology Department was incepted in the year 2002 and Accredited by NBA.

Having a state-of-art laboratory, the department offers both Bachelors and Ph.D courses which are affiliated with Anna University, Chennai

Vision

To provide a world-class department to facilitate learning, training and research in Biotechnology by providing infrastructural facilities and competent faculty leading to technological innovations to serve the global society

Mission

The Mission of the Department is to provide quality education to students and to produce competent Biotechnologists to meet the challenges faced by industry and mankind.

To inculcate high moral and professional standards among our students.

To develop the overall personality of the students.

STUDENT ACHIEVEMENTS

Placement

Our Department proudly congratulates Amsa Prabha S and Laura Jean on securing a placement offer. Both have been selected as an Programmer Analyst at Cognizant, Chennai with CTC of Rs 4.1 lakhs.

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Letter of Intent (LOI)

Superset ID: 6980535

Date: April 28, 2026

Dear Laura Jean F,

We are immensely glad to extend a hearty welcome to you to our Cognizant family.

1.This LOI refers to your application for employment with Cognizant Technology Solutions India Private Limited ("**Cognizant**") and subsequent discussions. Basis the information and representation provided by you, we have found you suitable for **GenC** role, and your designation will be **Programmer Analyst Trainee** . Upon final scrutiny, a formal full-time employment Offer letter with the compensation, terms and conditions, rules, regulations & policies ("**Employment Agreement** ") will be issued and such Employment Agreement shall be subject to and be effective only upon your successful completion of full-time internship, if offered to you, and background verification.

2. If full-time internship is offered to you,

a) You will have an opportunity to do a full-time Internship where you would be deployed into a formal training to a business specific skill track, and it will be used as basis towards your allocation to projects/roles and terms and conditions governing such training program shall be detailed in that Offer Letter.

b) It is hereby clarified that participation in this full-time Internship program shall not deem to constitute you to be an employee of Cognizant and the scope of this full-time Internship program does not include any supervisory responsibilities and that there is no agency, fiduciary or employer-employee relationship intended or created by reason of this LOI.

c) Cognizant shall carry no worker's compensation insurance or any health or accident insurance under this full-time internship program and not be liable to pay any contributions to applicable statutory payments such as workmen compensation, provident fund nor shall provide any other contribution or benefits which might be expected in an employer-employee relationship.

d) Cognizant will not encourage any claim with regard to compensation or other statutory payments under this LOI and it is here by clarified that participation in this full-time internship program shall not entitle you for any benefits paid or made available to that of Cognizant employees.

3. Upon successful completion of full-time Internship program and on completion of background verification, you would be onboarded as a full-time employee under a definitive Employment Agreement, as per business needs.

4. If direct full-time employment is offered to you upon your successful completion of background verification, you would be onboarded as a full-time employee under a definitive Employment Agreement, where you should successfully complete the Cognizant identified training program / on the job training. In the event of unsatisfactory performance during this training, Cognizant reserves rights at its sole discretion to terminate full-time employment.

5. Upon successful completion of full-time internship and joining as full-time employee, or directly joining as full-time employee, your annual total cost to company (CTC) shall be **INR 416,331 /- per annum.** The detailed information on compensation and benefits will be provided in your full-time employment Offer Letter.

6. Cognizant has zero tolerance towards malpractice in any form and reserves all rights with respect to hiring decisions and issue of full-time Offer. This document is only a lettor of intent and does not constitute any contractual relationship between you and Cognizant. Cognizant holds all rights to withhold or cancel this LOI and/or the Internship Offer Letter. Full-time employment Offer Letter due to non-conformance of performance benchmark or moral code of conduct.

Code of Conduct : You shall comply with Cognizant's Core Values and Standards of Business Conduct, located at and incorporated herein by reference.https://www.cognizant.com/us/en/documents/code-of-ethics.pdf

7. This LOI from Cognizant is valid for **5 calendar days,** from the date of the LOI. Hence, you are requested to accept or decline the LOI within 7 calendar days from the date of the LOI. In case we do not receive any response from your end within the aforementioned time period, this LOI shall stand withdrawn, and will be considered as void. Any extension to the LOI validity will be at the sole discretion of Cognizant. Please note that this LOI is not deemed to be considered as an employment contract or offer letter for purposes of joining Cognizant as an employee. For all onboarding formalities, the definitive Employment Agreement is required.

8. Upon accepting this LOI, you hereby consent for Cognizant Technology Solutions India Private Limited to receive the personal information and/or sensitive personal information ('Personal Information') submitted by you for background verification and share the same with its empaneled vendors located in India for conducting mandatory background checks for employment opportunities with Cognizant.

cognizant

Letter of Intent (LOI)

Superset ID: 6900889

Date: April 28, 2026

Dear AMSAPRABA A P,

We are immensely glad to extend a hearty welcome to you to our Cognizant family.

1.This LOI refers to your application for employment with Cognizant Technology Solutions India Private Limited ("**Cognizant**") and subsequent discussions. Basis the information and representation provided by you, we have found you suitable for **GenC** role, and your designation will be **Programmer Analyst Trainee** . Upon final scrutiny, a formal full-time employment Offer letter with the compensation, terms and conditions, rules, regulations & policies ("**Employment Agreement** ") will be issued and such Employment Agreement shall be subject to and be effective only upon your successful completion of full-time internship, if offered to you, and background verification.

2. If full-time internship is offered to you,

a) You will have an opportunity to do a full-time Internship where you would be deployed into a formal training to a business specific skill track, and it will be used as basis towards your allocation to projects/roles and terms and conditions governing such training program shall be detailed in that Offer Letter.

b) It is hereby clarified that participation in this full-time Internship program shall not deem to constitute you to be an employee of Cognizant and the scope of this full-time Internship program does not include any supervisory responsibilities and that there is no agency, fiduciary or employer-employee relationship intended or created by reason of this LOI.

c) Cognizant shall carry no worker's compensation insurance or any health or accident insurance under this full-time internship program and not be liable to pay any contributions to applicable statutory payments such as workmen compensation, provident fund nor shall provide any other contribution or benefits which might be expected in an employer-employee relationship.

d) Cognizant will not encourage any claim with regard to compensation or other statutory payments under this LOI and it is here by clarified that participation in this full-time internship program shall not entitle you for any benefits paid or made available to that of Cognizant employees.

3. Upon successful completion of full-time Internship program and on completion of background verification, you would be onboarded as a full-time employee under a definitive Employment Agreement, as per business needs.

4. If direct full-time employment is offered to you upon your successful completion of background verification, you would be onboarded as a full-time employee under a definitive Employment Agreement, where you should successfully complete the Cognizant identified training program / on the job training. In the event of unsatisfactory performance during this training, Cognizant reserves rights at its sole discretion to terminate full-time employment.

5. Upon successful completion of full-time internship and joining as full-time employee, or directly joining as full-time employee, your annual total cost to company (CTC) shall be **INR 416,331 /- per annum.** The detailed information on compensation and benefits will be provided in your full-time employment Offer Letter.

6. Cognizant has zero tolerance towards malpractice in any form and reserves all rights with respect to hiring decisions and issue of full-time Offer. This document is only a letter of intent and does not constitute any contractual relationship between you and Cognizant. Cognizant holds all rights to withhold or cancel this LOI and/or the Internship Offer Letter. Full-time employment Offer Letter due to non-conformance of performance benchmark or moral code of conduct.

Code of Conduct : You shall comply with Cognizant's Core Values and Standards of Business Conduct, located at and incorporated herein by reference.https://www.cognizant.com/us/en/documents/code-of-ethics.pdf

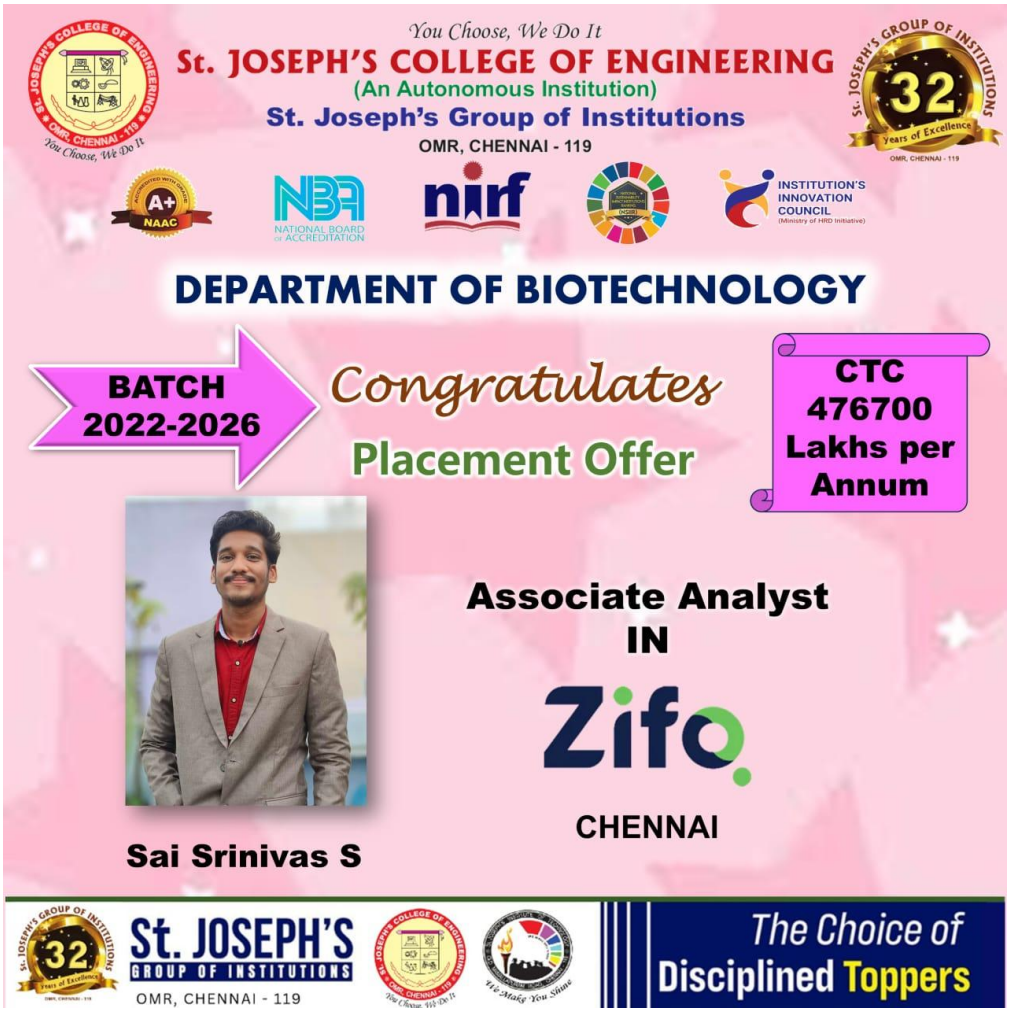
7. This LOI from Cognizant is valid for **5 calendar days,** from the date of the LOI. Hence, you are requested to accept or decline the LOI within 7 calendar days from the date of the LOI. In case we do not receive any response from your end within the aforementioned time period, this LOI shall stand withdrawn, and will be considered as void. Any extension to the LOI validity will be at the sole discretion of Cognizant. Please note that this LOI is not deemed to be considered as an employment contract or offer letter for purposes of joining Cognizant as an employee. For all onboarding formalities, the definitive Employment Agreement is required.

8. Upon accepting this LOI, you hereby consent for Cognizant Technology Solutions India Private Limited to receive the personal information and/or sensitive personal information ('Personal Information') submitted by you for background verification and share the same with its empaneled vendors located in India for conducting mandatory background checks for employment opportunities with Cognizant.

STUDENT ACHIEVEMENTS

Placement

Our Department proudly congratulates Sai Srinivas S on securing a placement offer. He has been selected as an Associate Analyst at Zifo, Chennai with CTC of Rs 4.7 lakhs.



STUDENT ACHIEVEMENTS

Higher Studies

Our final year student Keerthana SL as secured admission in The University of Queensland, Australia for her Masters in Molecular Biology with a scholarship of Rs. 23 lakhs

STUDENT ACHIEVEMENTS

Higher Studies

Our final year student Anusha S and Mayuri Arvind as secured admission in University College Dublin, Ireland for her Masters in Biotherapeutics and Biotechnology with a scholarship of Rs. 7 lakhs each

STUDENT ACHIEVEMENTS

Higher Studies

Our final year student Krithika V as secured admission in RMIT University, Australia for her Masters in Biotechnology with a scholarship of Rs. 12 lakhs

STUDENT ACHIEVEMENTS

Higher Studies

Our final year student Ferlinsa J as secured admission in University of Copenhagen, Denmark for her Masters in Biosolutions

STAFF ACHIEVEMENTS

Paper Published

Dr. L. F. A. Anand Raj has guided a total of 5 batches of final year students as a result 10 research papers and 2 patents have been published in the reputed journals under his guidance.

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 2, Mar-Apr 2026, pp:805-813 www.ijprajournal.com ISSN: 2456-4494

Advancing Cancer Treatment to Overcome Conventional Therapy Limitations Through Zinc-Based Nanoparticles: A Review

Dr. L. F. A Anand Raj* and Aromika Amitha*
*Department of Biotechnology, St. Joseph's College of Engineering, OMR, Chennai-600119

Date of Submission: 01-04-2026 Date of Acceptance: 11-04-2026

ABSTRACT:
Cancer is one of the issues that afflict many individuals. Physicians treat cancer through chemotherapy, radiotherapy and surgery. Such therapies do not necessarily work. They may also damage the body not only the cancer cells. Cancer stands one among the major causes of death and illnesses worldwide is still cancer. Scientists have been considering nanotechnology as a method of improving cancer treatment in the past few years. Of interest to them are, especially, zinc-made particles. These particles are good since they can combat cancer and they are cheap. They are non-toxic to people and animals. In such a way, zinc particles may be used to treat cancer. They are able to produce types of oxygen which kill cancer cells. They are also capable of causing cancer cells to die which is known as apoptosis. Zinc particles have the ability of damaging DNA of cancer cells to prevent their growth and release ions that interfere with the balance of cancer cells. The good thing with zinc particles is that, they are able to kill cancer cells independently. Cancer drugs can also be administered using them straight to the cancer cells. This implies that the drug is able to hit on the cancer cells precisely thus minimizing the damage to normal tissues. Zinc particles have been utilised in

I. INTRODUCTION:

Cancer affects people of all age and gender, it has become one among the leading causes of fatality worldwide. Genetic, environmental or cellular imbalances are some of the causes [1]. Cancer is characterised by the unmanageable proliferation of cells that metastasis across the body and violates the normal body signals. Therefore, cancer is fundamentally a genomic disease, caused by the progressive build up of genetic mutations and epigenetic alterations which damages the normal cellular functions [2]. These irregularities impair the checkpoints responsible for cell division, DNA repair, and apoptosis processes enabling the cancerous cells to divide freely. Cancer has key characteristics like avoiding proliferation inhibitors, resistance to programmed cell death, sustaining proliferative signalling, allowing cells to divide repeatedly without limits, helping in the formation of new blood vessels and leading to invasion and spread to other parts of the body [3]. Moreover, the current global trends like an aging population along with rising risk factors such as smoking, obesity, and exposure to environmental pollutants convey that both the number of cases and death rates would continuously increase [4]. Cancer remains one of the major global health

STAFF ACHIEVEMENTS

Paper Publication

Dr. S. Justin Packia Jacob has guided a total of 5 batches of final year students as a result 10 research papers and 2 patents have been published in the reputed journals under his guidance.

International Journal of Pharmaceutical research and Applications
Volume 11, Issue 2, Mar-Apr 2026, pp:274-284 www.ijprajournal.com ISSN: 2456-4494

Fermentation Optimization Using Genetically Engineered Microbes: Advances, Strategies, and Industrial Applications

Christina R Leo[1] and Justin Packia Jacob S[2]*
[1,2]Department of Biotechnology, St.Joseph's College of Engineering, OMR Road, Chennai-600119, Tamil Nadu, India.

Date of Submission: 07-03-2026 Date of Acceptance: 19-03-2026

Abstract
Modern industrial fermentation relies heavily on genetically modified microorganisms (GEMs) to produce fuels, chemicals, medications, and food ingredients in a sustainable and efficient manner. Strain development has evolved from empirical trial-and-error methods to predictive, model-guided procedures thanks to developments in metabolic engineering, synthetic biology, and systems-level design. This study offers a thorough summary of current developments in GEM-based fermentation optimization, including pathway and cofactor engineering, adaptive laboratory evolution, CRISPR-based genome editing, and omics-driven strain design. The integration of genetic engineering with sophisticated bioprocess techniques, including as fed-batch and continuous cultivation, medium optimization, real-time monitoring, and model-predictive control, is given special attention. Highlighted are new uses in the synthesis of amino acids, organic acids, biofuels, medicinal proteins, and precision fermentation for food systems. The review also covers important issues such scale-up heterogeneity, metabolic burden, genetic instability, and regulatory limitations. Lastly, future prospects are discussed, emphasizing the confluence of automation, digital twins, machine learning, and artificial intelligence toward autonomous, robust, and sustainable biomanufacturing systems.

Keywords: fermentation optimization, genetically engineered microbes, metabolic engineering, CRISPR, adaptive laboratory evolution, precision fermentation, bioprocess optimization.

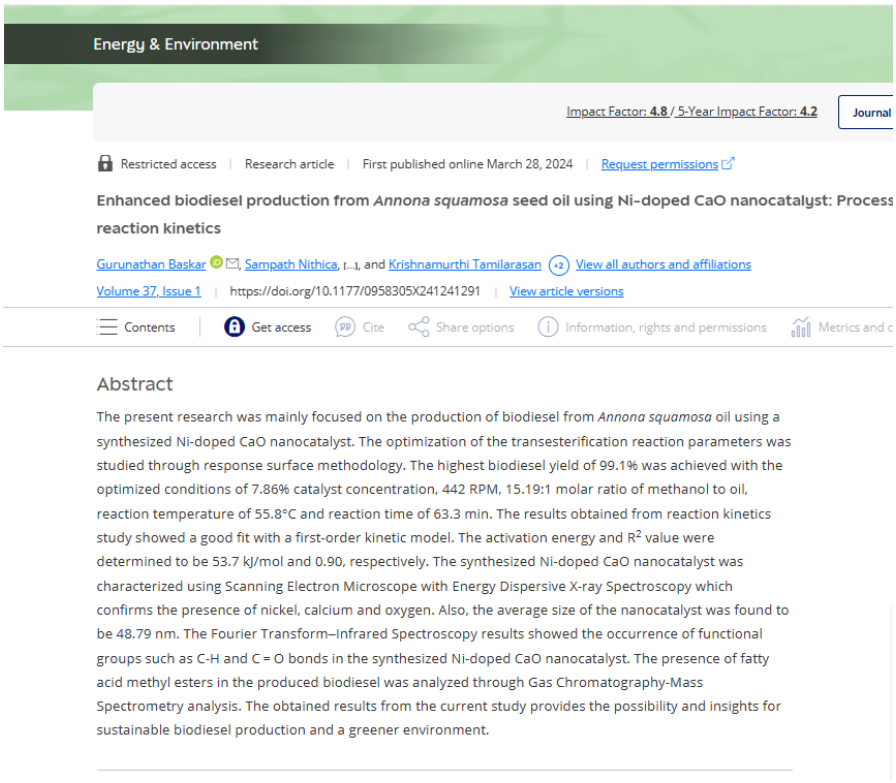
bioeconomy worth hundreds of billions of dollars each year thanks to the development of industrial biotechnology (Stephanopoulos (2012); Lee et al. (2019)). Antibiotics, amino acids, vitamins, organic acids, industrial enzymes, medicinal proteins, and renewable biofuels are among the products produced by microbial fermentation, which positions fermentation as a sustainable substitute for petrochemical-based processes.

In the past, random mutagenesis, adaptive selection, and empirical screening were used to create microbial strains. These methods produced economically viable strains, especially for the production of amino acids and antibiotics, but they were time-consuming, unpredictable, and had a narrow scope (Nielsen & Keasling (2016)). Moreover, conventional optimization techniques frequently ignored intracellular metabolic limitations in favor of concentrating on fermentation parameters like pH, temperature, aeration, and nutrient composition. These traditional techniques were no longer enough to achieve economic and sustainability objectives as industry needs switched toward higher titers, yields, and product specificity. Fermentation technology underwent a paradigm shift with the introduction of genetically modified microorganisms (GEMs). The logical redesign of microbial metabolism to guide carbon flux toward desired products while limiting by-product formation was made possible by developments in metabolic engineering and synthetic biology (Stephanopoulos et al. (1998); Nielsen (2017)). GEMs provide previously unheard-of control over microbial production systems by modifying biosynthetic pathways, regulatory networks, and cofactor

STAFF ACHIEVEMENTS

Papers Published

Dr. G. Baskar from the Department of Biotechnology has guided a total of 5 batches of final year students as a result 10 research papers and 2 patents have been published in the reputed journals under his guidance.



Energy & Environment

Impact Factor: 4.8 / 5-Year Impact Factor: 4.2 | Journal

Restricted access | Research article | First published online March 28, 2024 | Request permissions

Enhanced biodiesel production from *Annona squamosa* seed oil using Ni-doped CaO nanocatalyst: Process reaction kinetics

Gurunathan Baskar, Sampath Nithica, (...), and Krishnamurthi Tamilarasan, +2 View all authors and affiliations

Volume 37, Issue 1 | https://doi.org/10.1177/0958305X241241291 | View article versions

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Abstract

The present research was mainly focused on the production of biodiesel from *Annona squamosa* oil using a synthesized Ni-doped CaO nanocatalyst. The optimization of the transesterification reaction parameters was studied through response surface methodology. The highest biodiesel yield of 99.1% was achieved with the optimized conditions of 7.86% catalyst concentration, 442 RPM, 15.19:1 molar ratio of methanol to oil, reaction temperature of 55.8°C and reaction time of 63.3 min. The results obtained from reaction kinetics study showed a good fit with a first-order kinetic model. The activation energy and R^2 value were determined to be 53.7 kJ/mol and 0.90, respectively. The synthesized Ni-doped CaO nanocatalyst was characterized using Scanning Electron Microscope with Energy Dispersive X-ray Spectroscopy which confirms the presence of nickel, calcium and oxygen. Also, the average size of the nanocatalyst was found to be 48.79 nm. The Fourier Transform–Infrared Spectroscopy results showed the occurrence of functional groups such as C-H and C = O bonds in the synthesized Ni-doped CaO nanocatalyst. The presence of fatty acid methyl esters in the produced biodiesel was analyzed through Gas Chromatography-Mass Spectrometry analysis. The obtained results from the current study provides the possibility and insights for sustainable biodiesel production and a greener environment.

STAFF ACHIEVEMENTS

Papers Published

Dr. M. Chamundeeswari from the Department of Biotechnology has guided a total of 4 batches of final year students as a result 7 research papers and 1 patent have been published in the reputed journals under her guidance. She has also published 2 research and 1 patent as a part of her academic research

Research Article

Journal of Environmental Nanotechnology

Rice Husk Ash–derived Silica Nanoparticles as Eco-friendly Sensitizers for Enhanced Solar Photovoltaic Performance

Chamundeeswari Munusamy[1*], Mohanapriya Purushothaman[1], Chitrakala Subramanian[1], Mary Nancy Flora Rayappan[2]and Ramya Ravi[3]

[1]Department of Biotechnology, St. Joseph's College of Engineering, OMR, Chennai, TN, India
[2]Department of Chemical Engineering, Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Avadi, Chennai, TN, India
[3]Department of Petrochemical Engineering, JCT College of Engineering and Technology, Coimbatore, TN, India
Received: 23.02.2026 Accepted: 04.03.2026 Published: 30.03.2026
*chamundeeswari@gmail.com

ABSTRACT

Nanostructured silica has attracted considerable attention due to its high surface area, tunable physicochemical properties, and wide applicability in electronic, catalytic, and biomedical systems. In this study, high-purity silica nanoparticles were synthesized from rice husk ash through a thermo-chemical route, providing a value-added strategy for agricultural waste utilization. The novelty of this work lies in the development of rice husk-derived silica nanoparticles as sensitizing materials for photovoltaic applications. Structural and morphological properties of the synthesized material were characterized using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), scanning electron microscopy coupled with energy-dispersive X-ray spectroscopic, transmission electron microscopy (TEM), Brunauer–Emmett–Teller analysis and X-ray fluorescence (XRF) spectroscopy. FT-IR spectra showed characteristic peak at 779 and 1112 cm^{-1}, confirming the formation of an amorphous silica network, while XRD exhibited a broad diffraction peak at $2\theta = 21.57°$, indicating the amorphous nature of the material. The XRF analysis confirmed ~100% silica purity, and TEM images revealed uniform particles with sizes below 10 nm and mesoporous morphology. Photovoltaic performance evaluation demonstrated enhanced voltage generation under sunlight irradiation compared with green-synthesized carbon nanoparticles and the conventional dye Coomassie Brilliant Blue. These findings suggest that rice husk-derived silica nanoparticles can serve as promising eco-friendly sensitizing materials for sustainable photovoltaic applications.

Keywords: Rice husk; Silica nanoparticles; Muffle furnace; Xerogels; Siloxane.

STAFF ACHIEVEMENTS

Certificate of Appreciation

Dr. M. Chamundeeswari from the Department of Biotechnology has won best paper presentation under the Research Scholar category at the IMSTEM 2026

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Certificate of Achievement

This Certificate is Presented to

Dr.M.Chamundeeswari

Associate Professor, BioTechnology, St Joseph's College of Engineering, OMR, Chennai, India.

won the Best Paper Presentation under the Research Scholar Category award for the research paper entitled

Valorization of Jackfruit (Arachis Hypogea L.) Peel Waste into Nanocellulose: Process Optimization, Structural Characterization, and Dye Remediation Performance

at the "Second International Conference on Innovations in Materials Science, Technology, Engineering, and Management for Sustainable Development (IMSTEM 2026)"- Organized by the Department of Science, St. Joseph's College of Engineering, OMR, Chennai, Tamil Nadu, India & RSP Research Hub, Coimbatore, Tamil Nadu, India on 20.03.2026 & 21.03.2026.

Dr. Vaddi Seshagiri Rao, M.E.,M.B.A., Ph.D. Principal

Mrs. S. Jessie Priya, M.Com. Executive Director

Mr. B. Shashi Sekar, M.Sc. Managing Director

Dr. B. Babu Manoharan, M.A.,M.B.A., Ph.D Chairman

SJCE & RSP IMSTEM 2026 - B61

STAFF ACHIEVEMENTS

Paper Publication

Dr. Sangeetha B, Ms. A. Anli Dino, Dr. Poornimaa Mu, Ms. Vinitha S and Ms. Sridevi R. have collectively contributed to multiple peer-reviewed publications in reputed journals by mentoring final year students.

No. of Papers Published: 5
No. of Patents Published : 2

No. of Papers Published: 5
No. of Patents Published : 3

No. of Papers Published: 4
No. of Patents Published : 3

No. of Papers Published: 2
No. of Patents Published: 1

No. of Papers Published: 3
No. of Patents Published: 1

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