NEWSLETTER

BIOFOCUS

DEPARTMENT OF BIOTECHNOLOGY

VOLUME 01

2024 - 2025

"LIFE BEGINS IN THE BIOTECH LAB – WHERE INNOVATION MEETS DISCOVERY!"

KUMARAGURU
college of technology
character is life

Biotechnology is the future.
It is the only way we are going to be able to feed
and fuel the world's growing population.

CRAIG VENTER

In this Issue

1 Message

1.1 Vision, Mission, HOD's Message & From the Editorial Desk

1.1.1 About the Department

The Department of Biotechnology is a pioneering department, which harnesses and nurtures specific skill sets that integrates life science and technology, and the curriculum is constantly upgraded to suit the demands of the industry. Faculty members are trained both in reputed institutes and industries periodically in a constantly evolving field of engineering relevant to biotechnology. Currently, the Department of Biotechnology offers B.Tech.(Biotechnology), M.Tech.(Biotechnology) and Ph.D.(Full/Part-time) with a well-structured and balanced curriculum focusing on the major areas viz., Healthcare, Nutrition, Bioprocess Technology and Environmental Biotechnology.

1.1.2 From the HOD's Desk

The Department of Biotechnology commenced its academic and scientific journey in the year 2002, and built up ambience and infrastructural facilities for effective academic and research activities over the period. Our students have excelled in curricular, co-curricular and extra-curricular activities. The faculty members engage in effective curriculum delivery and research on socially relevant projects. Most of our graduates get placed in life science related companies and the rest pursue higher studies in reputed institutes in India and abroad. Our graduates, spread all over the world, are the dynamic ambassadors of our performance.

Dr. ***Vinohar Stephen Rapheal***, Associate Professor & Head

1.1.3 Vision

Strong teaching and research foundation in the area of biotechnology and allied fields through knowledge dissemination to students and the public and to scale new heights in the frontier areas of health and environment and ethics for welfare of humankind globally.

1.1.4 Mission

1. Develop dynamic curriculum and syllabus to promote innovative and create practices.

2. Encourage students for innovation and setting start-ups and equip leadership an entrepreneurial skills
3. Train students on issues related to social welfare.

1.1.5 From the Editorial Desk

Post the success of the previous issue the Biofocus Newsletter [2023-24] is back with much more interesting stories and happenings in the department. In this issue, key events and inside story of the event is also elaborated. Write-ups and special pages from students are been compiled together.

Dr. ***Ram K*** , Assistant Professor-III & Editor-Biofocus

Paper Publication by Faculty

2

– **April 2024**

* **Veerichetty,** H. M., Sivaraman, V., Jeyasaravanan, L., & Dharmalingam, T. (2024). Evaluation of pomegranate seed extract as a tyrosinase inhibitor for hyperpigmentation treatment. Indian Journal of Pharmaceutical Education and Research, 58(3), 965-975.

– **June 2024**

* **Veerichetty, V** & Nachimuthu, S. (2024). In-Vitro and In Vivo Anti-Inflammatory Activity of Fucoidan from Sargassum wightii. Indian Journal of Pharmaceutical Sciences, 86(3).

* Sivaramalingam, S. S., Jothivel, D., Govindarajan, D. K., Kadirvelu, L., Sivaramakrishnan, M., Chithiraiselvan, D. D., & **Kandaswamy, K.** (2024). Structural and functional insights of sortases and their interactions with antivirulence compounds. Current Research in Structural Biology, 100152.

3 Faculty Participation

3.1 Faculty Participation in FTP, STTP, Workshop and Other Training Programs

– **June 2024**

  * Dr. D. R. Manimaran participated in an FDP at Biocon Academy from June 17 to June 28, 2024 (12 days, offline), which included lectures and industry exposure.
  * Dr. K. Kumaresan attended a 3-Day UHV FDP at KGiSL Institute of Technology, Coimbatore, from June 18 to June 20, 2024 (3 days, offline), which included lectures and assessment training.
  * Dr. A. Thirumurugan attended an FDP on Current Bioprocess Technology Products and Opportunities, organized by the Department of Biotechnology, KL University, Andhra Pradesh, from June 29 to July 3, 2024 (5 days, online).

– **July 2024**

  * Dr. A. Thirumurugan continued attending the FDP on Current Bioprocess Technology Products and Opportunities until July 3, 2024 (5 days, online).

4 Notable Events

Photo. 4.1: Students of Batch 2022-24 and 2023-24 M.Tech Biotechnology attended a Pasteur Institute of India, Connoor.

Photo. 4.2: Dr D.R Manimaran receiving the training certificate from Director. Salavadi Easwaran , Biocon Academy, Bengaluru

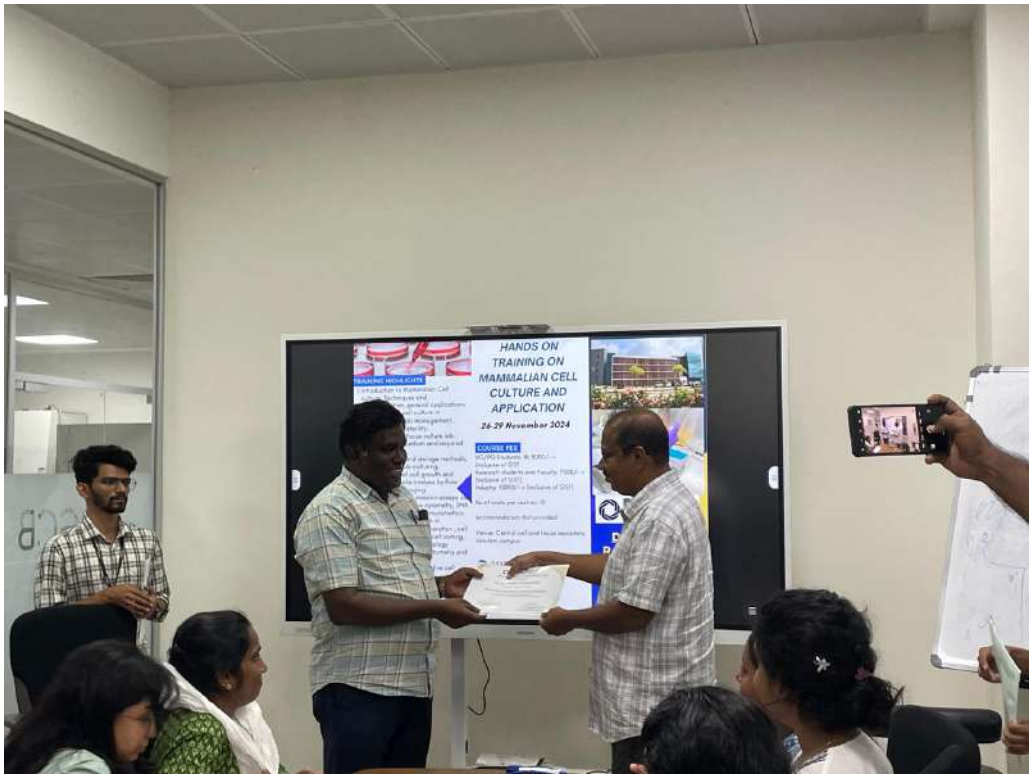

Photo. 4.3: Dr K Kumaresan receiving the training certificate in Rajiv Gandhi Centre for Biotechnology (RGCB), Trivandrum, Kerala.

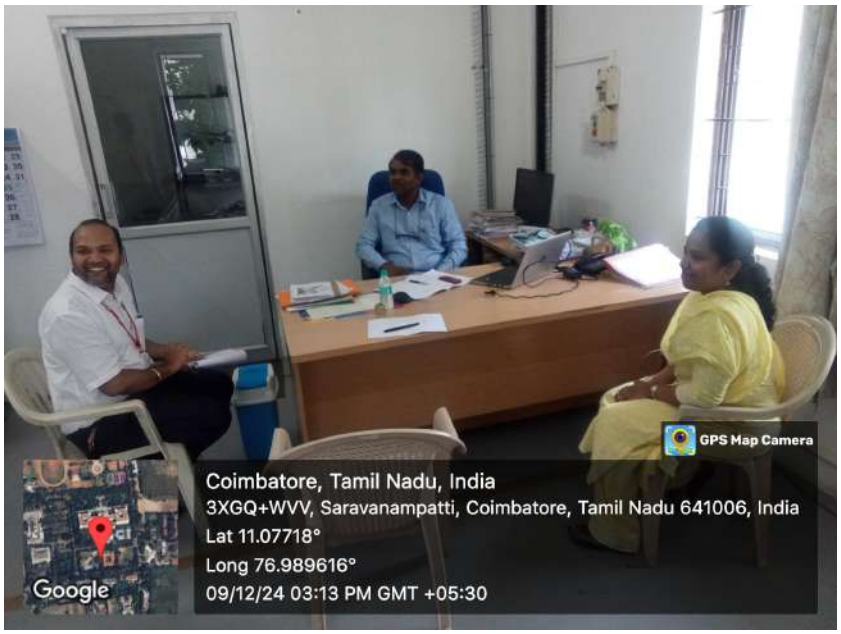

Photo. 4.4: Alumni Visit – Mr. Nandha Kumar [Batch 2011] and Ms. Gayathri [Batch 2016] visited the department.

4.1 Industry Internships

4.1.1 BioNEST - Bioprocess Training

Students attended the **BioIgnite - 6 days hands-on training programme on Bioprocess** , organized by PSG-STEP , BioNEST, PSG College of Technology, Coimbatore

Photo. 4.5: Bioignite - Students with the BioIgnite Coordinator - Mr. Dharani Kumar

Photo. 4.6: Bioignite - Active Participation of Students

4.1.2 BioNEST - Molecular Biology Training

Students of Batch 2022-26 attended the **BioIgnite - 6 days hands-on training programme on Molecular Biology** , organized by PSG-STEP , BioNEST, PSG College of Technology, Coimbatore

Photo. 4.7: Bioignite - Students with the BioIgnite Coordinator

4.1.3 Bioline Lab, Coimabatore

Students of Batch 2022-26 attended the training programme in Bioline Laboratory, Coimbatore

Photo. 4.8: Students successfully completed the training on Clinical Biochemistry in Bioline

Pasteur Institute 5

5.1 The Journey of Pasteur Institute of India: Pioneering Vaccine Production

The Pasteur Institute of India, located in Coonoor, Tamil Nadu, holds a prominent place in the history of vaccine production and public health in India. Established in 1907, it was founded under the guidance of renowned French scientist Louis Pasteur's principles. The institute's journey from a humble beginning to becoming a leader in vaccine production is a testament to its pioneering spirit and commitment to public health.

Photo. 5.1: Louis Pasteur FRS

In the early 20th century, India was grappling with several infectious diseases, including plague, cholera, and rabies. At the time, there was a severe shortage of effective vaccines, and the demand for local production was pressing. This void led to the establishment of the Pasteur Institute of India, whose primary mission was to provide affordable, high-quality vaccines for the Indian population.

Under the leadership of Dr. A.S. Ramaswamy, the institute began producing vaccines such as rabies and smallpox, which were essential to combating these widespread diseases. By focusing on local needs, the institute was able to produce vaccines tailored to the specific challenges faced by India. This allowed for mass vaccination campaigns that significantly reduced mortality from these diseases.

In addition to rabies, the Pasteur Institute of India also expanded its work into the production of other vaccines, including those for diphtheria, tetanus, and tuberculosis. These efforts played a crucial role in reducing the burden of infectious diseases across India, helping to improve overall public health. Over time, the institute became one of the leading centers in

India for vaccine production and research, contributing to various public health initiatives and campaigns.

One of the most significant milestones in the institute's history came in the 1950s, when it began producing the BCG vaccine for tuberculosis. This vaccine became a cornerstone of the national immunization program and helped India make great strides in the fight against tuberculosis.

Today, the Pasteur Institute of India continues to be a key player in the production of vaccines, including rabies and tetanus, serving as a critical resource for public health in India and abroad. It stands as a symbol of India's progress in vaccine technology, offering affordable and accessible vaccines for the masses. The institute's contributions to the health sector not only transformed the country's approach to vaccination but also positioned India as a global leader in vaccine production, ensuring that millions of lives are saved every year.

AI-Threat

6

Artificial Intelligence (AI) has revolutionized various fields, including biotechnology, by enhancing research efficiency, streamlining data analysis, and expediting drug discovery. The integration of AI in biotechnology has led to significant advancements in genomics, personalized medicine, and bioinformatics. However, the rapid progress also raises concerns regarding ethical implications, data security, and the potential risks of autonomous decision-making in critical applications.

AI-driven tools such as AlphaFold by DeepMind have demonstrated remarkable accuracy in predicting protein structures, accelerating drug design and molecular biology research. According to Max Tegmark in *Life 3.0: Being Human in the Age of Artificial Intelligence*, **"AI has the potential to help humanity flourish like never before–or to self-destruct"** (Tegmark, 2017). This dual nature of AI highlights both its promise and its perils.

One major concern in biotechnology is the potential misuse of AI in genetic engineering and synthetic biology. With AI algorithms assisting in CRISPR-based genome editing, the risk of unintended consequences or even biosecurity threats cannot be ignored. In *AI Superpowers: China, Silicon Valley, and the New World Order*, Kai-Fu Lee cautions, **"AI is neither good nor evil. It is a tool. But how we use it will determine our fate"** (Lee, 2018). This statement underscores the need for ethical frameworks to regulate AI applications in biotechnology.

Moreover, AI systems are trained on vast datasets, often collected from human genetic information. This raises concerns about data privacy, consent, and the potential for biased algorithms that could disproportionately impact certain populations. The need for transparent policies and international collaboration is paramount to mitigate these risks.

While AI continues to transform biotechnology with groundbreaking innovations, it is essential to address the challenges it brings. By establishing robust regulations, fostering interdisciplinary collaboration, and prioritizing ethical considerations, society can harness AI's potential while mitigating its risks in biotechnology.

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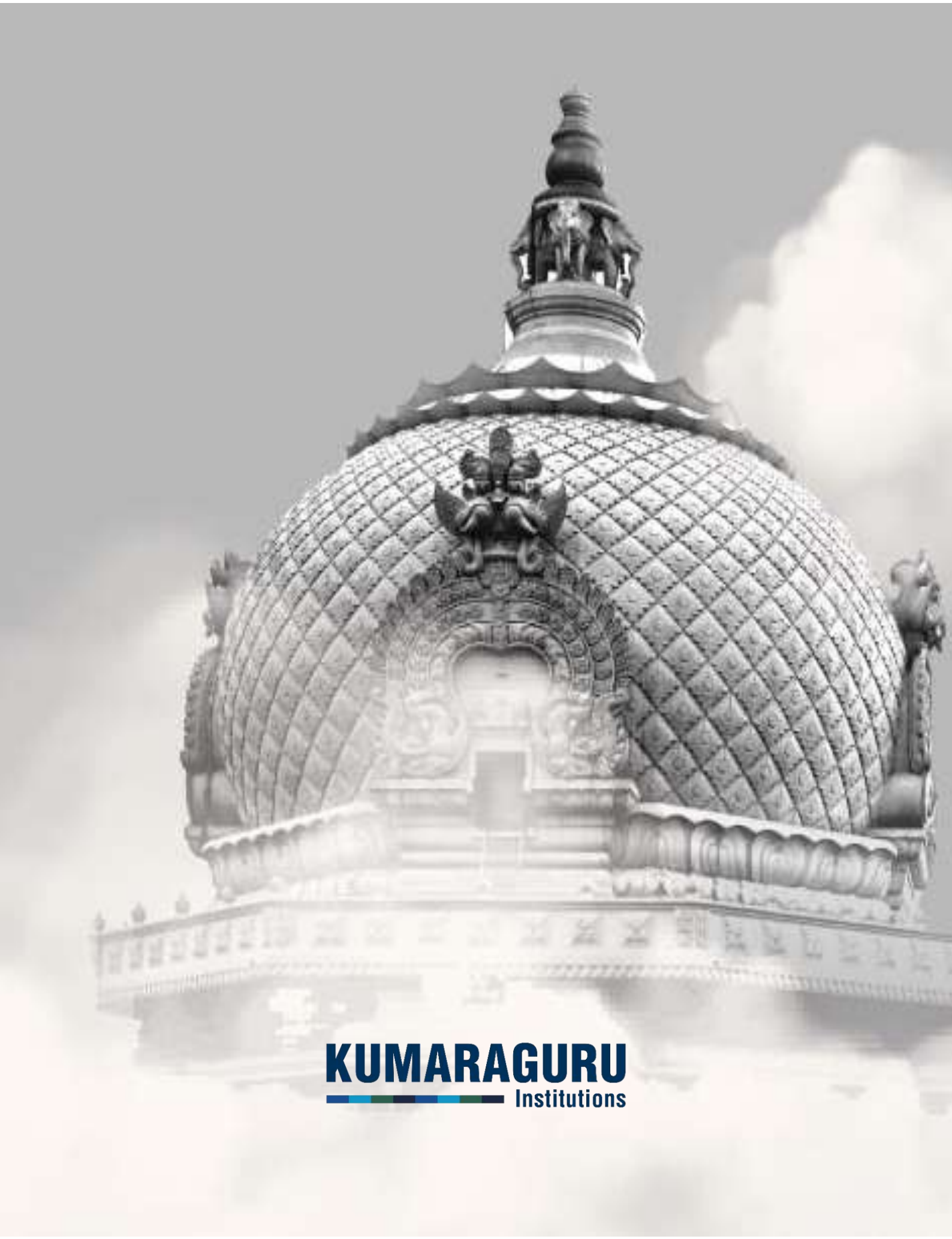
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