CHEMISTRY R&D CENTRE:

Establishing an R&D Centre within the Department of Chemistry in 2016 and gaining recognition from the Centre for Research at Anna University in 2018 is a commendable achievement. This demonstrates a strong commitment to advancing scientific knowledge and conducting impactful research within the institution.

Having two faculty members with Ph.D. degrees and Anna University supervisor recognition indicates the expertise and leadership within your team. With their guidance, aspiring scholars can benefit from mentorship and support, facilitating high-quality research outcomes.

The presence of advanced equipment and facilities in R&D Centre, including a microbial culture facility (Laminar Airflow), Gas chromatography, AAS, shaker, and deep freezer, underscores your commitment to conducting cutting-edge research. These facilities provide essential tools for conducting experiments and analyses across a wide range of research areas.

R&D Centre's focus on drug discovery from marine natural resources against MDR (Multi-Drug Resistant) pathogens is particularly relevant and impactful. With the rise of antibiotic resistance posing a significant global health threat, the exploration of novel antimicrobial agents from marine sources holds great promise.

Additionally, the research focus on superconductor material research highlights the engagement in fundamental scientific inquiries with potential technological applications. Superconductors exhibit fascinating properties at low temperatures, with implications for various fields such as energy transmission, medical imaging, and quantum computing. By exploring superconductor materials, your R&D Centre contributes to advancing our understanding of condensed matter physics and materials science.

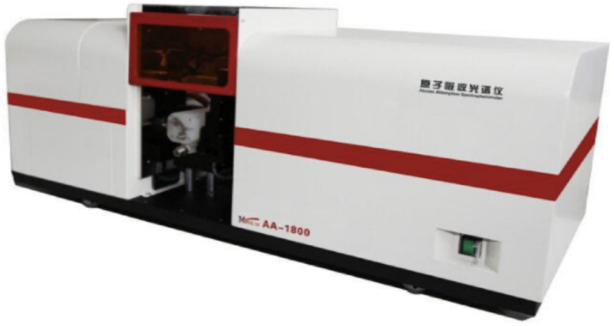
Faculty details

S.No	Name of the faculty member	Designation	Field of research	Contact details
1	Dr. G. Govindarajan (AU ref. 4170143)	Associate Professor	Natural Product Chemistry, AMR Biochemistry, Biotechnology	govindarajan.g@shanmugha.edu.in
2	Dr. V. Senthil Kumar	Associate Professor	Bioactive ceramics and tissue Engineering applications	dr.senthikumar36@gmail.com
3	Dr. Rubiga (AU ref. 4270026)	Assistant Professor	Chemistry- Mesoporous material research	rubiga.m@shanmugha.edu.in
4	Dr. S. Thirumurugan	Assistant Professor	Nano material Photocatalysis	thirumurugan.s@shanmugha.edu.in
5	Dr. M. Marimuthu	Assistant Professor	Integration of Energy conversion and storage device	marimuthum@shanmugha.edu.in
6	Dr. Devel Sathiya Shivan Shankar	Assistant Professor	Small molecule and Supramolecular Chemistry	devalsathiyashivan@shanmugha.edu.in

FACILITIES

Atomic Absorption Spectroscopy

Atomic absorption spectroscopy is used to analyze the amount of ions and salts present in the water sample.



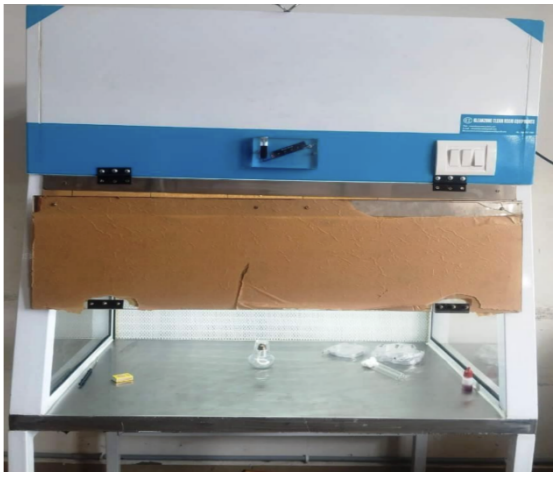
Gas Chromatography

Gas chromatography is used to detect the volatile components in food and water contaminants that can be used for the water purification, food and agricultural applications.

<u>Centre of excellence in Biosciences</u>

Laminar Air flow chamber

Laminar flow chamber is routinely used for microbial culture development, screening of microbes for industrial applications like antibiotics, enzymes production. Antibacterial testing etc.



Shaker (Remi)

Large scale Fermentation of microbial secondary metabolite, Bacterial growth and suspension preparation

Deep Freezer -20 ºC

Antibiotics, fine chemicals, enzymes and microbial culture storage and maintenance, protein precipitation studies

Autoclave

Mainly used for preparation of culture media for bacterial growth. Killing harmful microbes, spores etc

Water Distillation Unit

Recent Publications:

P. Sivakumar, S. Priyatharshni, K.B. Nagashanmugam, A. Thanigaivelan and K. Kumar, "Chitosan capped nanoscale Fe-MIL-88B-NH2 metal-organic framework as drug carrier material for the pH responsive delivery of doxorubicin", Mater. Res. Express 4 085023 (2017).

K.B. Nagashanmugam, P. Sivakumar and A. Thanigaivelan, "Evaluation of chromium (VI) removal by carbons derived from oil cake of Sesamumindicum L", Indian Journal of Environmental Protection 37(2):103-116 (2017)

P. Sivakumar, S. Priyatharshni and K. Kumar, Fluorescent silver nanoparticles for sensitive and selective detection of dopamine, Materials Chemistry and Physics 240:122167 (2019)

G.Govindarajan, Chandrasekar Balu, Suganthi Ganesan, Samuel Raj Babu Arulmani, Sabariswaran Kandasamy. 2023. Antibiofilm activity of Bio surfactant produced by a sponge associated marine Cobetia sp. JCG-23. Biomass Conversion and Biorefinery. http://doi.org/10.1007/s13399-023-04808-3.

K.Kalimuthu, N.R. Srinivasan and **G.Govindarajan**. 2023. Antibiotic-Peptide Conjugation Against Multi-drug Resistant Pathogens: A Comprehensive Review for Therapeutics and Drug Delivery Strategies. International Journal of peptide Research and Therapeutics.29:91. https://doi.org/10.1007/s10989-023-10561-y.

Projects completed :

o	Period	Work undertaken	Title	Status
1	2016	Project on waste water treatment by Dr. K.B. Nagashanmugam	Evaluation of Chromium (VI) removal by carbons derived from oilcake of sesamum indicum	Completed
2	2016	Project on drug delivery materials by Dr. P. Sivakumar	Chitosan capped nanoscale metal organic framework for anti-cancer drug delivery	Completed
3	2017	Preparation of polymer membrane for the removal of ionic impurities from waste water by Dr. K.B. Nagashanmugam	Preparation of membrane is completed. Incorporation of functional groups needs to be started.	Completed
4	2017	Silver and Gold nanoparticles modified polymer membrane for antimicrobial activity by Dr. P. Sivakumar	Preparation of modified membrane is completed and charactersiation study needs to be completed.	Completed
5	2017	Polymer membranes for ultra purification of bio-diesel by Dr. P. Sivakumar and Dr. K.B. Nagashanmugam	Membrane is prepared. But pore size needs to be controlled to nano size.	Completed
6	2017	Green synthesis of Gold and Silver nanoparticles for anti-microbial and biosensing applications Dr. P. Sivakumar	Work completed. Based on the results of experiments, a paper is being compiled for publication in a journal.	Completed

		and Dr. K.B. Nagashanmugam		
7	**2017**	**Production of bio-diesel using vegetable oils such as neem oil, mustard oil and pongamia oil (karanj oil) by Dr. P. Sivakumar and Dr. K.B. Nagashanmugam**	**Completed. Two different bio-diesel were prepared from a blend of neem + mustard oil and pongamia oil. The efficiency of both the diesel prepared were tested on an engine. Comparison of bio-diesel revealed that, the performance and efficiency bio-diesel prepared by mixing neem oil & mustard oil is better than that of bio-diesel prepared from pongamia oil.**	**Completed**
8	**2018-19**	**Project on biosensors by Dr. P. Sivakumar**	**Fluorescent Silver Nanoparticles for dopamine sensing**	**Completed**
9	**2020**	**Project on biosensors by Dr. P. Sivakumar**	**Mass spectrometric detection of glutathione in brain extracts**	**Completed**
10	**2021**	**Project on waste water treatment by Dr. P. Sivakumar**	**Colorimetric Silver Nanoparticles for the detection of alkaline earth metals in tap water**	**Completed**
11	**2023**	**Dr.G.Govindarajan**	**COMPARATIVE STUDY OF BIOETHANOL FROM ELEPHANT FOOT YAM WITH VARIOUS FEEDSTOCKS**	**Completed**

Research Scholar: Full time 1: Title: “Green synthesis of Metal oxide nanoparticles for biological applications”

Chemistry R&D In charge

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