



JNANA CHETANA

Where Science meets Innovation



Message



It gives me great pleasure to introduce *Jnana Chetana*, the inaugural issue of the official newsletter of Shriram Institute for Industrial Research, Bengaluru. Launched on the occasion of India's 79th Independence Day, this issue embodies our commitment to scientific excellence, innovation, and collaboration. I commend the *Jnana Chetana* team and wish them continued success.

Smt. Urvashi Tilak Dhar, President

It is my pleasure to extend warm greetings to the Shriram Institute for Industrial Research, Bengaluru, on the release of the first Issue of *Jnana Chetana*. The title signifying the Awakening of Knowledge reflects India's rich scientific heritage and spirit of inquiry. As we celebrate Independence Day, it is also a time to honor the freedom to innovate and build a sustainable future. Shriram Institute has played a vital role in advancing research and supporting national growth. I congratulate the editorial team for this initiative and wish *Jnana Chetana* continued success in inspiring knowledge, innovation, and collaboration.



Shri. Akshay Dhar, Governor

It gives me great pleasure to present the inaugural issue of *Jnana Chetana*, the newsletter of our Institute which is being launched on our Independence Day. It reflects the spirit of intellectual freedom, our ability to think independently, explore boldly and share openly. This platform will highlight our research, achievements and the people behind it. Let us continue to uphold our values, strive for excellence and work together to drive innovation for the betterment of industry, society and the nation.



Shri. S. Manicka Vasagam, Director

About us

The Shriram Institute for Industrial Research (SRI), founded in 1947 by Sir Shriram a noted Industrialist and Philanthropist, envisioned the institute to advance India through research in science & technology. The SRI Bengaluru (SRI-B) was established in 1984 and relocated to its present campus, with the foundation stone laid by Prof. M. G. K. Menon on 24 July 1989 and inaugurated by Prof. C. N. R. Rao on 26 June 1992. SRI- B is known for its contributions to science & technology development, innovation and applied research for industries and government bodies in Southern India. Equipped with modern laboratories and skilled experts, the institute focuses on delivering innovative, reliable and sustainable solutions tailored for Industrial and client needs.

Through its commitment to quality, scientific excellence and industry collaboration, SRI-B plays a vital role in supporting industrial competitiveness and fostering technological progress in the region.



HIGHLIGHTS

- First time SRI-B team conducted “Founder Memorial Lecture” on 03.05.2025, which became a Phenomenal and memorable day for SRI-B. To mark this event Dr. C. G. Krishnadas Nair delivered lecture on “The role characterization and testing of materials in aerospace Industries”.
- Shri Tilak Dhar Ji’s memorial day was observed on 01.07.2025 at SRI-B, by paying floral tributes.
- First "Shriram Tilak Dhar Memorial Cricket Tournament" was held on 05.07.2025 marked a memorable day, with enthusiastic participation across the Institute.
- In parallel, SRI-B made significant strides in business and academic collaborations. MoUs were signed between institutions including Indian Academy Degree College, CSIR-CFTRI, Surana College, Biosustains Pvt. Ltd., Hycons Pvt. Ltd., and SANF Greenmens Pvt. Ltd. for joint research and product development.
- The Director and team engaged with key industry players such as Airbus, Boeing, ITC and Heritage Foods, fostering potential partnerships and business expansion.
- Collaborative visits to institutes like IISc, CSRTI, UPASI and PII further strengthened R&D initiatives.



TOP NEWS

- The Director represented SRI-B as a keynote speaker at NSAT-2025, on 09.05.2025, reinforcing the institute’s leadership.
- Strategic industry engagements continued with a meeting with Airbus on 15.05.2025, followed by discussions with ITC on 19.05.2025, opening new avenues for innovation.
- Academic collaboration was emphasized through a visit to IISc on 27.05.2025 and a high-level meeting with Boeing and TASL on 28.05.2025.
- A significant milestone was reached on 29.05.2025, with the signing of a Memorandum of Understanding (MoU) with CFTRI. Later, on 20.06.2025, the team explored joint research with UPASI.
- Garden City University students from Master’s program visited SRI-B on 16.05.2025, for an industrial visit.
- The SRI-B Team, in association with Indian Academy Degree College - Autonomous, conducted HPLC Techniques and Application training on 30.04.2025 and 09.05.2025.
- On 25.06.2025 and 26.06.2025, SRI-B engaged with Heritage Foods, Indian Agro Exports Pvt. Ltd., Sri Sri Tattva LLP, Sri Varsha Food Teams, Leon Food Products, Jadli Global Farms, Foods & Inns Ltd., Jyothir Aditya BioSolutions Ltd., STS Biotech Pvt. Ltd., EagleEye Drones, IAPMO R&T Centre, TUV Rheinland, Cropnosys India Pvt. Ltd., and Galla Family Pvt. Ltd.
- Oxford College of Science students from Master’s program visited SRI-B on 25.06.2025, for an industrial visit.
- Crowning the quarter, SRI-B prioritized employee well-being by enrolling in a Group Medical Policy on 28.07.2025.

Important Events

The 2nd RAC meeting was held on 03.04.2025 at SRI-B. The key outcomes highlighted the potential to enhance impact through strengthened auditing capabilities, sustainable campus initiatives, employability-oriented training and youth skill development. Priority areas for research include wellness foods, EV battery recycling and biodegradable plastics.

The meeting emphasized the importance of collaborations with start-ups and academic institutions, scalable research models, improved knowledge dissemination and a strong focus on digital knowledge. Management, intellectual property protection in publications and prompt meeting documentation will strengthen institutional growth, visibility and innovation.



On 09.04.2025, our RAC member Dr.CGK.Nair former Chairman, HAL visited our Institute and new Instrumentation Lab alongwith Mr. Prajwal & Mr. Chamarajendra and had Discussion with our Team SRI-B

ITC Team (Mr. Patchaimuthu, Mr. Bisvaranjan Rout, Mr. Ujjal Kumar Datta and Mr. Rahul Sisdia) visited our Institute on 19.05.2025 to understand the infrastructure & Technical Capability of institute for their requirements. ITC need regular Analysis of raw materials and end product for there outsource manufacturing facility at Hoskote and Guntur.



On 29.05.2025, a significant milestone was achieved as SRI-B signed an MoU with CFTRI, Mysore. This MoU marks the beginning of a collaborative partnership between the two prestigious institutes. The agreement aims to foster mutual cooperation in areas of research, development and innovation, paving the way for shared expertise and joint initiatives. This event is seen as a 'red-letter day' in the journey of both institutions, signifying a promising future of academic and scientific collaboration.

VIJNANA LOKA

Know Your Scientist: Homi Jehangir Bhabha

“INSTITUTES ARE BUILT AROUND OUTSTANDING INDIVIDUALS.”

Homi Jehangir Bhabha: Pioneer of India’s Nuclear Program and a Man of Many Interests

Homi Jehangir Bhabha is widely known as the architect of India’s nuclear efforts. Born in 1909 into a Parsi family, he went to Cambridge University and became a respected theoretical physicist. His early research on how electrons - positrons interact and on cosmic rays, won him international recognition.

In the 1940s he returned to India and worked to build a strong scientific base for the newly independent country. With support from the Tata Trust and government backers, he founded the Tata Institute of Fundamental Research (TIFR) in Mumbai in 1945. He later set up the Atomic Energy Establishment at Trombay, which was renamed the Bhabha Atomic Research Centre (BARC) and which became central to India’s atomic energy work.



Bhabha’s most notable technical idea was a three-step plan for nuclear power designed for India’s resources. Because India had little uranium but plenty of thorium, his plan began with reactors using natural uranium to make plutonium, moved on to fast breeder reactors and aimed ultimately to use thorium-based reactors. The goal was long-term energy security and technological independence for India.

Bhabha was also interested in the arts and nature. He painted, enjoyed classical music and liked botany. His offices and surroundings reflected these interests he mixed scientific tools with art and plants. He believed that science and the arts complemented each other and helped human creativity.

Known for his dedication to public service, Bhabha declined a government salary and focused on building institutions. He never married, explaining that his life was devoted to science and creative work. He died mysterious plane crash in 1966 — an event that sparked speculation, given his key role in India’s nuclear program. Despite his early death, the institutions he founded and the plans he set in motion remain an important part of India’s scientific legacy.



Scientific Articles

GUT FEELING: THE SCIENCE BEHIND YOUR SECOND BRAIN

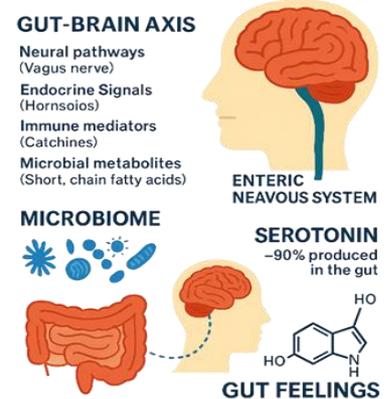
K. N. Chandrashekara

- The phrase “Gut Feeling” isn’t just a metaphor it’s backed by science. Our gut and brain are connected through a complex network called the gut-brain axis (GBA), which includes the vagus nerve, hormones, immune signals and microbial chemicals. At the center of this communication is the enteric nervous system (ENS), often called the "second brain", which contains over 100 million neurons and can operate independently of the brain.
- Interestingly, about 90% of the body’s serotonin a key neurotransmitter is produced in the gut by specialized enterochromaffin cells. While this serotonin does not cross the blood–brain barrier to directly influence mood, the gut still plays a major role in mental health through the GBA a complex communication network linking the gut, brain and immune system.
- The gut microbiome, consisting of trillions of microbes, can influence brain function, mood and behaviour by producing neuroactive compounds, regulating inflammation and interacting with the nervous system. Research has linked imbalances in gut bacteria to conditions such as anxiety, depression, autism spectrum disorders and Parkinson’s disease, although many of these findings are still under active investigation.

- Understanding this connection opens up new possibilities for treating mental and physical health issues through diet, probiotics and stress management. The gut is not just for digestion it’s a powerful player in how we think, feel and decide.

Gut Feeling

The Science Behind Your Second Brain

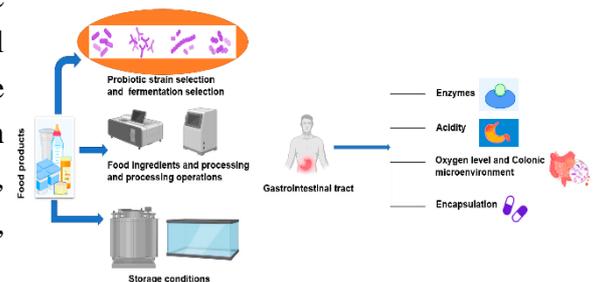


RECENT ADVANCES IN PROBIOTIC PRODUCTION AND APPLICATIONS

Microorganisms have long been harnessed for producing valuable metabolites that support human health and environmental sustainability. Among them, probiotics are particularly important due to their safety, health-promoting properties and adaptability in industrial biotechnology. Probiotics offer numerous benefits, including enhancing digestive health, correcting vitamin deficiencies, boosting immunity and detoxifying harmful substances.

They also show therapeutic potential in managing conditions such as constipation, inflammatory bowel disease (IBD), colon cancer, type 2 diabetes and obesity. However, comprehensive updates on their mechanisms and clinical applications remain limited. Recent biotechnological advancements have improved the identification and optimization of efficient probiotic strains, enabling their large-scale production and clinical use. Current research. With the integration of standardized tools and modern technologies, probiotics are emerging as reliable solutions for health and industrial applications. These developments play a crucial role in tackling global health issues and advancing sustainable bioproduction.

Guru Prasad V.



Scientific Articles

HUMAN METAPNEUMOVIRUS (HMPV) DISEASES, AND TRANSMISSION

First discovered in 2001, Human Metapneumovirus (HMPV) is a common and highly contagious respiratory virus that presents a significant public health challenge worldwide. As a relative of the more widely known RSV, HMPV is a major cause of both upper and lower respiratory tract infections, leading to a wide spectrum of illnesses from the common cold to serious conditions like bronchitis and pneumonia.

The virus is particularly dangerous for our community's most vulnerable: infants, young children, older adults and individuals with weakened immune systems. It is also a known trigger for worsening pre-existing conditions like asthma.

HMPV spreads easily through respiratory droplets from coughs and sneezes, close personal contact and by touching contaminated surfaces, allowing it to be transmitted in homes, schools and healthcare settings alike.

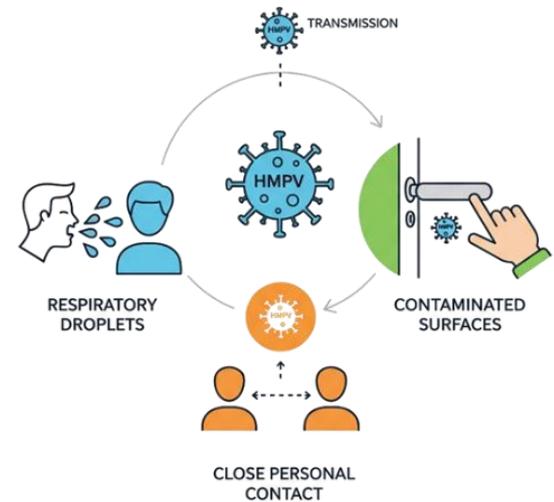
Following an incubation period of about 3 to 7 days, symptoms appear and can range from mild, cold-like signs to severe respiratory distress. Globally, the virus's impact is felt with seasonal peaks in late winter and spring, similar to influenza and RSV.

While researchers are actively prioritizing the development of vaccines and targeted therapies, there is currently no specific treatment. Therefore, public awareness and preventative measures like thorough and frequent hand hygiene remain our most critical and effective defences against its spread.

Source: WHO, CDC, The Lancet Microbe., various clinical infectious disease journals., NIH, Vaccines (MDPI Journal).

Asweshvaran R.

HOW HMPV SPREADS



KNOW YOUR CHEMICALS

Once celebrated in the 19th century as a revolutionary anesthetic and famously used by Queen Victoria during childbirth, chloroform is a colourless, sweet-smelling liquid that has since fallen from favour due to its significant health risks. Its use was discontinued after discovering its severe toxicity, including the potential for long-term liver, kidney and nervous system damage. It is now classified as a possible human carcinogen by the International Agency for Research on Cancer (IARC).

Today, chloroform's role is confined to heavily regulated laboratory settings where it serves as a solvent, especially for DNA extraction. However, it carries a unique chemical hazard: when exposed to heat or light, it can degrade into phosgene (COCl_2), a highly toxic gas once used as a chemical weapon. It is also crucial to note that contrary to its portrayal in movies, chloroform is not an instant "knockout drug." Inducing unconsciousness actually takes several minutes of inhalation and is extremely dangerous, carrying a high risk of overdose.



VIJNANA LOKA

A Success Story

Field Demonstration of SRI-B Formulation in Grapes

K. N. Chandrashekara, Sunitha C. and S. Satheesh Kumar

A field demonstration on a four-acre grape farm (Varieties: Sharad, Sonaka and Bangalore Blue), organized by Dr. Amar in collaboration with farm owner Shri. Murali, evaluated the formulation's impact on crop health and yield. Over 20 progressive farmers from nearby villages attended the event.

The application of SRI-B resulted in a 13–15% increase in chlorophyll content, indicating improved plant vigor and photosynthetic activity. Yield rose by 7 tons, with better fruit set, enhanced cluster compactness and improved fruit quality. Farmers observed the treated plots, learned about SRI-B's role in enhancing root zone activity, promoting beneficial microbial growth and improving nutrient uptake and heard Shri. Murali's firsthand account of notable improvements in vine health and productivity.

The demonstration served as a valuable platform for knowledge exchange, sparking strong interest among participants for adoption in their own farms. The results highlight SRI-B's potential as a sustainable and impactful solution for grape cultivation, setting a benchmark for future horticultural trials.

The SRI-B formulation trials and demonstration produced positive results. Treated grapevines showed:

- Enhanced vegetative growth with broader, dark green leaves.
- Improved berry size (length - 3 cm, width - 2 cm), deep black color on ripening, higher sweetness (TSS - 16–20° brix) and yield gains of 18–20% over control.
- Significant pest reduction - thrips (2% incidence) and mealy bugs (3% incidence).
- Tolerance to major diseases such as powdery mildew, downy mildew and anthracnose.
- Prolonged shelf-life (2 weeks) with minimal post-harvest losses (1–2%).

The study will be expanded to involve 20 progressive farmers, each conducting trials in their own fields. It will focus on two key horticultural crops Grapes and Pomegranates under diverse agro-climatic conditions. This farmer-participatory approach will enable real-world performance assessment of the SRI-B formulation across multiple locations. Findings from this expanded trial are expected to validate results, encourage wider adoption and guide future recommendations for sustainable crop management.

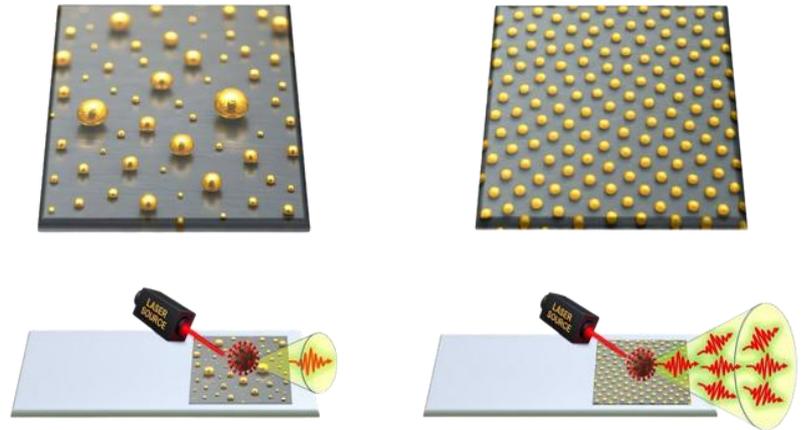


YUVA VICHARA

Scientists at IISER Pune and IIT Bombay have developed a ground breaking, low-cost technique called "confined dewetting" that could revolutionize diagnostics and environmental monitoring. This simplified method involves heating an ultra-thin metal film (like gold, silver, or copper) while it is sandwiched between a surface and a silicone layer. This process forces the metal to reorganize into a grid of perfectly uniform, densely packed nanoparticles.

Published in the journal Small Methods, this breakthrough offers a cost-effective and scalable alternative to complex, expensive manufacturing. The technique's precision paves the way for the next generation of ultra-sensitive sensors, capable of detecting faint disease signals like cancer biomarkers or minute environmental pollutants such as lead in water, marking a major leap forward in nanotechnology.

This schematic illustrates why "confined dewetting" is a breakthrough for sensor technology. Unlike the inconsistent particles created by ordinary dewetting (top left), the confined method (top right) produces smaller, highly uniform and densely packed nanoparticles. The direct result is a significantly more powerful Raman signal, which is crucial for building more sensitive and reliable detectors.



NAMMA NEW TEAM NAMMA PRIDE



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Project Trainee
Chemical Laboratory



Mr. Kiran Nayak M K

Project Trainee
Petroleum Laboratory



Mr. Abhishek V. A.

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Ms. Shobha Tonduru

Scientist C
Environment Laboratory



Mr. Arun

Project Trainee
Microbiology Laboratory

Jnana Chetana

Editorial Team

Science Quiz



What is the only letter not appearing in the periodic table?

- a) J b) Q c) X d) Z

- | | |
|----------------------------|------------|
| 1. Mr. S. Manicka Vasagam | : Chairman |
| 2. Dr. K.N. Chandrashekara | : Convener |
| 3. Mr. D. Nagaraj | : Member |
| 4. Mr. K.M. Nagendra Kumar | : Member |
| 5. Dr. Guru Prasad, V. | : Member |
| 6. Mr. Asweshvaran, R. | : Member |
| 7. Ms. Pooja, T. | : Member |
| 8. Mr. Jeevan, C. | : Member |

SRI-B Forthcoming Events



Customer Meet Program – Engaging with our valued customers to strengthen partnerships and explore future opportunities.

Brainstorming Session – With MoU-signed universities to discuss and initiate collaborative research projects.



Hands-on Training – For academia and industrial partners, focusing on their respective skill development.

Collaborative Seminars & Conferences – Jointly organizing with partners to share knowledge, innovation, and emerging technologies.

