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Sami Labs Ltd

Integrating traditional knowledge with technology

Remedies from nature play a significant role to curb and regulate changes because of the ever-increasing irregular lifestyle. Sami Labs Ltd incorporated in Bengaluru is among the country's few indigenous companies accenting the use of Ayurvedic medicines globally. Delve deeper to understand the workings, processes, developments and innovations formulated at the R&D wing of Sami Labs.



On entering the premises of the Sami's R&D center, one can find how several advanced technologies such as High Performance Liquid Chromatography (HPLC), Gas Chromatography (GC), Mass Spectrometry (MS), Nuclear Magnetic Resonance (NMR) etc, are being deployed to formulate and validate claims of India's 5,000-year old traditional medicine. "Ayurveda has long been rooted in India but was neglected in R&D. We believe in 'do no harm' studies. We began research and came up with formulations to convince the world that the Ayurvedic products are non-toxic," says Dr Muhammed Majeed, Founder and Managing Director, Sami Labs Ltd.

Sami Group began its journey in 1988 with establishment of Sabinsa Corporation by Dr Majeed in New Jersey, US. The company was established with an objective of importing and marketing generic drugs into the US market. The corporation was later made as the American arm of the Sami Labs headquartered in Bengaluru. For over two decades, the group has been unlocking the mystery of herbs by extracting their goodness and offering the world a means to good health, the nature's way.

Strong focus on research

With photochemistry and nutraceutical products at the heart of its business, Sami Labs is among a few of the research oriented organisations in the country, which is in a constant phase of innovation and discovery of novel products. Standardised herbal extracts, specialty chemicals and phytochemicals are continuously updated in the list of products of the company. "The phytochemistry division is one of the

major contributors to the growth of this company. It has all the capability of developing a new product," explains Dr Majeed. Identification, isolation, characterisation of the bioactives and optimisation of the extraction methods form the core activities of this department.

The strength of the R&D phytochemistry is its rich intellectual manpower. "We believe in our people, they form the company," says Dr Majeed. The plant extracts are standardised against specific chemical markers, which are at several instances reported for the first time. This also contributes to the large list of patents that the group has acquired.

A range of supercritical extracts for several phytoactive constituents have been developed using super critical carbon dioxide. The aim is to avoid the use of organic solvents in plant extraction. The methodology of research and innovation involves different stages with emphasis on scale up and commercialisation. The stages include:

- » Extraction of appropriate plant material/plant part with suitable solvent or solvent mixture.
- » Purification and identification of unknown compounds.
- » Isolation of pure compounds and determination of their structure by spectroscopic methods.
- » Biological efficacy and safety efficacy study of the isolated pure molecule, if required.
- » Developing standardised extracts and formulating them in a suitable marketable form as an active ingredient.
- » Optimising the extraction technology, suitable for commercial scale.

All-round development

The biotechnology R&D is an integral part of the core R&D of Sami Labs. "The current focus of research is on probiotics, prebiotics and synbiotics products," avers Dr Majeed. The group also has a synthetic chemistry division that encompasses a wide range of highly practical, economically driven, bulk preparation of chemicals and very elegant enantiomer specific synthesis of a complex natural product. This department has developed and commercialised a number of molecules of pharmaceutical, nutraceutical and cosmeceutical importance in the last 20 years. The characterisation of synthetic compounds is supported by state-of-the-art analytical facilities such as HPLC, GC,

Infrared spectroscopy (IR), NMR, Liquid Chromatography–Mass Spectrometry (LC-MS), Gas Chromatography–Mass Spectrometry (GC-MS) and Carbon, Hydrogen, and Nitrogen (CHN) analysers. Until now, more than 50 compounds have been scaled up in the pilot plant.

The laboratory focuses on the development of new processes for the target molecule (natural or designed) from readily available, inexpensive starting material in simple, safe and resource effective operation that proceeds quickly for quantitative yields. The process also involves development of new reaction and methodologies for efficient synthesis of bioactive molecules, discovery of practical routes to compounds of value from readily available natural products and synthetic analogs of already existing natural products for improved biological activity.

The microbiology division is an integral part of the Analytical R&D of Sami Labs. The lab has been assessed by the National Accreditation Board for Testing and Calibration Laboratories (NABL). It is also being certified with the ISO/IEC 17025: 2005 standard. The lab provides microbiological analytical support to the R&D with complete assistance for troubleshooting technical issues for quality control and quality assurance unit.

Formulation R&D department develops different dosage forms. The various dosage forms designed here include oral tablets, sustained release tablets, multiple layered tablets, dispersible tablets, effervescent tablets, stick pack powders, medicated tooth paste, topical gels, ophthalmic drops, nasal drops, medicated candies, pelletised capsules are just a few to name. The formulation R&D division is involved in the development of final products for customer use. It receives raw materials from other divisions of Sami Labs for formulation. Pre-formulation as well as formulation studies are carried out to aid the design of various dosage forms. Formulation R&D has state-of-the-art pilot scale manufacturing facility for trial and scaling up the products in a pilot batch. Once the formulation is done, it is scaled up to pilot batch followed by production. Anti-obesity, anti-hypertensive, pre-probiotics, anti-diabetics, liver supports, anti-glaucoma, joint health, prostate care, eye health,



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revitalisers, rejuvenators and many such products are developed here.

Staying abreast of scientific trends

Nanoscience and nanotechnology has been the focus of research institutions world over. Nanomaterials find application in pharmaceuticals, specialty chemicals, cosmetic ingredients and healthcare arena. With a view to improve the activity of nutraceutical and cosmeceutical products, Sami Labs recently established nanoscience division. "Activities of the research department here, have already selected a few key products for development," reveals Dr Majeed. The primary function of this division is to take the active ingredients and convert them to nanomolecules (about 100 to 150 nm particle size) retaining activity and improvising efficacy with least toxicity. The company has received several awards, and as a matter of fact to be noted here, is the 'Nutra Excellence Award' for the best company in the field of research and development at the 8th Nutra Summit, held earlier this year. **MR**



Nuclear Magnetic Resonance (NMR) used for analysis at R&D centre