Dr.N. Kalaiselvi

First woman Director-General of the CSIR

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सीएसआईआर
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When a person believes in learning from every interaction and every environment, it is certain that one day they will become a leader! This is what the life of Dr. Kalaiselvi, the first woman DG of the CSIR (Council of Scientific and Industrial Research) shows us.

Hailing from Tamil nadu, young Kalaiselvi went to a Tamil medium school at Ambasamudram, a small town with cultural heritage and historical significance. While studying B.Sc. Chemistry at the Government Arts College for Women, Tirunelveli, her hard work and consistency in learning earned her University rank from Madurai Kamaraj University. She completed her postgraduate studies at Government Arts College, Coimbatore. She saw her teachers as a great motivation and inspiration who showed her the path. Intellectual thirst combined with an inquiring mind made her pursue research leading to a Ph.D. in synthetic organic chemistry, specialising in the area of heterocyclic compounds.

After a short stint of teaching in a college, Dr.Kalaiselvi began her research career in 1997, by joining CSIR-Central Electrochemical Research Institute (CSIR-CECRI) at Karaikudi in Tamil nadu. There, she focused on electrochemistry research, mainly on developing lithium batteries.

In her career spanning more than 25 years, she has addressed problems on electrochemical power systems, development of electrode materials, custom designed synthesis methods, optimisation

of reaction parameters and electrochemical evaluation of in-house prepared electrode materials for their suitability in energy storage device assembly.

"In 1997-1998, India's Lithium-Ion Batteries (LIBs) technology was in its infancy. It was a new area that offered an enormous opportunity to do R&D at the electrode level. This turned out to be an exciting area. Today, 80% of Indians have mobile phones, which are powered by LIBs. In the future, we shall witness a revolution in e-mobility, in which different kinds of batteries will power them. So research in this area is fascinating and will radically change the way we generate and use energy," she says.

Her research interests include super capacitors and waste-to-wealth driven electrodes and electrolytes for energy storage and electro catalytic applications. With consistent contributions for more than two decades in developing indigenous approaches as well as creating materials and transferable technologies, she became the first woman director of the CECRI in 2019. **With this visionary's team efforts, CECRI has been setting up indigenously-developed first-of-its-kind lithium-ion battery manufacturing plants in Chennai with a capacity of producing 1,000 batteries a day.**

Highlights

- More than 125 research papers; 6 patents
- MRSI medal,
- CSIR Raman Research Fellowship,
- INSA-NRF Exchange award,
- Brain Pool Fellowship of Korea

Dr.Kalaiselvi has successfully executed numerous collaborative and sponsored research projects funded by DST, MNRE, DRDO and CSIR. She served as a nodal scientist for MULTIFUN (Multifunctional Electrodes and Electrolytes for Futuristic Technologies) project to the tune of ₹ 68.54 crore with CSIR-CECRI as the nodal lab and 6 other CSIR Institutes as participating labs during 2012-2017.

She has been involved in the development of practically viable Sodium-ion/Lithium-sulphur batteries and super capacitors. Her farsightedness has accelerated our country's growth through the Ministry of Non Renewable Energy (MNRE) for the implementation of e-mobility in India, with indigenous technological support in a major way. She coordinated the preparation of the Technical Report on National Mission for Electric Mobility (NMEM). As a part of TIFAC, the think tank of Government of India, Dr.Kalaiselvi has played a crucial role in planning and executing our government's response to the fast changing technological scenario globally fostering collaboration among academic, research and industrial partners. She was the theme director of Energy and Energy Devices (E2D) of CSIR.

In August 2022, Dr. Kalaiselvi was appointed as the DG of CSIR & Secretary of DSIR, leading the network of 38 national laboratories across our country, developing cutting edge technology. She is at the helm, steering activities to achieve the plan CSIR in 2030 laid out for Amrit Kaal (India's vision for 2047) and then extend or leverage the progress achieved to meet India's 2047 goals. The first step towards fulfilling this promise is towards realising the UN Sustainable Development Goals (SDGs) by 2030.

She highlights that one of CSIR's highest priorities is to steer the country's missions as an empowered leader of global South for a sustainable future. Dr.N.kalaiselvi who spearheads the institution where she started her career as an entry-level scientist emphasises the importance of societal missions. She reiterates, "Through CSIR 800, we are aiming to reach the "unreached" parts of the country, where almost 800 million people live. The goal is to understand the problems faced by individuals in remote areas and address them by employing technologies". **This mission aims to improve quality of life by providing technical assistance for low cost housing, affordable health care, potable water supply, sustainable energy and protecting the environment.**

In this regard, societal programmes like CSIR-HARIT (**Harnessing Appropriate Rural Interventions and Technologies**) are designed to focus on enhancing quality of lives of rural communities, helping socio-economic development through CSIR interventions and innovative technologies.

One of the biggest triumphs of CSIR-HARIT is the development of blight-resistant **Samba Masuri** (an important rice variety), which has almost doubled the farmers' income and better yield. Dr Kalaiselvi practises open conversations, transparency during interactions and reinforces the need to have faith in oneself and others.

This exemplary leader believes that the next 20-25 years are crucial for India. "India has entered a phase of *Amrit Kaal*. During this period,

the country's youth population will increase. **Our performance in the coming two decades will have a bearing on India's long-term future. We must work towards self-reliance and achieve Atmanirbharata in all sectors.** We must sustainably use our available resources and leave a better planet for our future generations, because we have only one earth on which we can all have only one future."