



## **TITLE: Advancing Otorhinolaryngology through Flexible EMI Shielding Materials: A comprehensive review**

**Name:** Feba Anna John, Ajith James Jose

**Affiliation:** Post Graduate and Research Department of Chemistry, St Berchmans Autonomous College,

Affiliated to Mahatma Gandhi University, Kottayam, Kerala, India

**Country:** India

**Email ID:** febanna@gmail.com

### **ABSTRACT**

The increasing prevalence of electronic devices in healthcare sectors has led to concerns regarding electromagnetic interference, necessitating effective shielding strategies. Here, we explore the potential of EMI shielding materials to revolutionize otorhinolaryngology, offering insights into their applications, benefits and challenges. The betterment of the field of otorhinolaryngology with effective EMI shielding materials is vital because it encompasses diagnoses and treatments related to the head and neck.

Electromagnetic radiation sometimes interferes with the performance of therapeutic devices (cochlear implants and hearing aids) and diagnostic imaging devices (MRI, CT and X-ray), which is undesirable. Effective shielding materials can mitigate electromagnetic interference by reflecting or absorbing the radiation, thereby enhancing the performance of devices. Moreover, they offer protection against external electromagnetic fields, safeguarding patients and medical professionals.

Here, we emphasise the pitfalls of employing conventional EMI shielding materials like metal in medical implants and medical devices. We also highlight the advancement of polymer-based EMI shielding materials over this. Explain the cases of various biocompatible polymers like polyvinylidene fluoride (PVDF), polyurethane (PU), polypropylene (PP), polyethylene (PE), polyimide (PI), poly (methyl methacrylate) (PMMA), biopolymers etc., in medical implants.

The enhancement of EMI shielding effectiveness of polymers with suitable fillers like MXenes, carbon-based materials and metals has a pivotal role in advancing otorhinolaryngology. Challenges such as biocompatibility, durability, and integration into the existing medical devices of shielding materials are addressed critically.

The technological evolution with 5G networking and modern electronic devices unfolds the demand for better shielding materials, providing avenues for future research and development in otorhinolaryngology.



**Presenter Name:** Feba Anna John

**Mode of Presentation:** Oral

**Contact number:** +91 9747707033



## BIOGRAPHY

Feba Anna John is a committed PhD student in chemistry under the guidance of Dr. Ajith James Jose at St Berchmans Autonomous College, affiliated with Mahatma Gandhi University, Kerala, India.

Before transitioning to her doctoral studies in 2022, she earned an MPhil in Environmental science from the same university.

She brings a wealth of experience to her academic pursuits, having served as an editor for an educational magazine and spent four years as an assistant professor in Chemistry. Her expertise extends to mentoring graduate-level student projects, showcasing her commitment to nurturing the next generation of scientists.

She has contributed significantly to her field, presenting original research at international conferences and publishing works on polymer-based energy materials, including two book chapters.

Her doctoral research focuses on developing electromagnetic interference shielding materials from polymer nanocomposites, poised to benefit sectors such as medicine, construction, research, telecommunication, etc.

Despite her academic and professional achievements, Feba prioritizes her role as a mother of two, balancing her family responsibilities with her scholarly endeavours.

With her diverse background, extensive experience, and unwavering dedication, Feba Anna John is optimistic about making further strides in advancing scientific knowledge and inspiring future generations in the field of Chemistry.