TBIS

Topic of the Speech:
Piezoelectric Poly-L-Lactic Acid Film-based Wearable Sensors

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Dr. Lu Jin is an Associate Professor at Yiwu Research Institute of Fudan University in China. He received his Ph.D. degree from the Department of Materials at The University of Manchester, which he pursued with the support of a CSC scholarship. Prior to this, he completed his M.S. degree at Dankook University in South Korea. After his master's graduation, he accumulated research experience at several institutions, including the Personal Protective Equipment Center in South Korea, The Hong Kong Polytechnic University in China, and Kyung Hee University in South Korea, actively participating in various international scientific research projects.

His research interests lie in the piezoelectric thin-film materials and their novel applications, with a primary focus on the utilization of piezoelectric poly-L-lactic acid (PLLA) materials in wearable sensors for air flow detection, strain sensing, and motion recognition. The main research achievements include the design and development of the first generation of wearable piezoelectric airflow transducer, which has proven effective in measuring human respiratory flow and metabolism in complex environments. Based on the unique piezoelectric properties of uniaxially stretched PLLA films, he invented the world's first wearable unimodal strain sensors and integrated them with artificial intelligence to demonstrate finger-air-writing applications. His research findings have been published in international SCI journals, including npj Flexible Electronics, ACS Sensors, Advanced Functional Materials, ACS Applied Materials & Interface, etc.

ABSTRACT SUBMISSION
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Piezoelectric Poly-L-Lactic Acid Film-based Wearable Sensors

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ABSTRACT

In 1992, Japanese scientist Dr. Eiichi Fukada discovered the piezoelectric properties of uniaxially stretched poly-L-lactic acid (PLLA) films, laying the foundation for the study of piezoelectric PLLA films. Unlike most piezoelectric materials, piezoelectric PLLA films only have a shear piezoelectric coefficient (i.e., d14) and do not exhibit a pyroelectric effect. This means that its signal is not affected by temperature fluctuations, thereby improving the stability and practicality of wearable sensors. The presenter will first briefly review the development history of piezoelectric polylactic acid films and then introduce the latest progress in piezoelectric PLLA film research in recent years, including the presenter's scientific achievements in this field, such as wearable piezoelectric airflow transducers, wearable unimodal strain sensors, etc.