BioSpectrum
the business of Bio & Health Sciences
ASIA EDITION

Korea develops world's first nanomesh structured electronic skin device

September 28, 2022 | News

DGIST developed the world's first electronic skin with a mesh structure that allows for long-term attachment with no discomfort



A research team led by professor Lee Sungwon from the Department of physics and chemistry at Daegu Gyeongbuk Institute of Science and Technology (DGIST) in South Korea has succeeded in developing the world's first ultrathin and breathable nanomesh (mesh) organic field-effect transistor (OFET) that can be applied to electronic skin devices.

Nanomesh OFET, in combination with various sensors, is expected to enable direct measurement of physiological data from the skin surface and optimize data processing.

Electronic skin refers to electronic wearable devices worn on the skin to collect biosignals, such as temperature, heart rate, electromyogram, and blood pressure, and transfer the data. Owing to the recent increase in interest in smart healthcare systems with wearable devices, related technologies are being actively developed.

A soft sensor that can attach to smooth and constantly moving skin surfaces is required to accurately measure physiological signals using a real-time health care system. As a result, most electronic devices worn on the skin surface have been manufactured using substrates with flat surfaces such as plastic and rubber.

However, long-term attachment of substrate with flat surface structure and low liquid and vapor permeability to biological skin can cause unexpected diseases to occur (such as atopy, metabolic disorders, among others). Hence, it is necessary for electronic devices that come in contact with biological tissues to achieve high permeability to ensure long-term use. Accordingly, research on polymer nanofiber-based nanomesh devices with good permeability has been attracting considerable attention.