Wearable Sensor for Long-Term EKG and EMG Monitoring [1]

North Carolina State University researchers have developed a wearable sensor [2] capable of detecting electrophysiological signals such as electrocardiography (EKG) or electromyography (EMG). These detection methods are typically used in a hospital setting to monitor the electrical activity of a patient’s heart and skeletal muscles respectively. Traditional sensors [3] with these functions in hospitals use wet electrodes that improve the strength of the electrical signal through an electrolytic gel placed between the sensor [2] and the patient’s skin [4]. These wet electrodes are not ideal for long-term monitoring because the conductive gel dries out, a patient’s skin [4] can get irritated, and the accuracy of the sensor [2] is reduced. The NC State researcher’s new technology utilizes silver nanowires to monitor electrophysiological signals as accurately as wet electrodes, and even more accurately when the patient is moving, providing an alternative long-term monitoring technique.

Dr. Yong Zhu of NC State previously created highly conductive and elastic conductors using silver nanowires. The technology consists of nanowires integrated into a stretchable polymer, and are utilized in this application in the form of a wristband to be worn by the patient. The stretchable nanowire [5] polymer conforms to the patient’s skin [4], providing even and accurate sensing when the patient is in motion. Additionally, the nanowires are highly conductive, which is why they are able to maintain such a high signal quality without the use of wet electrodes. These nanowire [5] sensors [3] are fully compatible with standard EKG and EMG reading devices, making their implementation easy. The material used in these sensors [3] is comparable in price to the currently used wet electrodes; however, the cost of manufacturing remains a constraint. Cost reducing improvements to the process would put this technology on track to be highly competitive with the currently used devices.

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Development Stage:
• Off-Market [7]
Mechanism:

- Passive Nanostructure [8]

Material:

- Silver [9]

Risk Characterization:

- Uncertain [10]

Risk Assessment:


Challenge Area:

- Health [12]

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Terms and Conditions

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Links:
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