IASST designs new smart sensor for adjusting drug dosage to manage Parkinson's Disease

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Sensor is made by coating a silk-fibroin protein nano-layer, derived from Bombyx mori silk cocoons

Scientists at Guwahati-based Institute of Advanced Study in Science and Technology (IASST), an autonomous institute of the Department of Science and Technology, have developed an affordable, user-friendly, portable smartphone-based fluorescence turn-on sensor system that can assist in managing Parkinson's disease.

The sensor would help in accurately detecting the concentration of L-dopa in the body, thereby helping to determine the precise dosage required for effective control of the disease.

Parkinson's disease is marked by a continuous decrease in neuron cells, which leads to a significant reduction in dopamine (neurotransmitter) levels in our body. L-dopa is a chemical which is converted to dopamine in our body and so act as anti-Parkinson's drugs.

It helps in compensating the deficiency of dopamine. As long as the correct amount of L-dopa is administered, the disease remains manageable. However, due to the progressive nature of Parkinson's, as the patient ages, more L-dopa is needed to compensate for the ongoing loss of neurons.

However too much of the L-Dopa can cause serious side effects like dyskinesia, gastritis, psychosis, paranoia, and orthostatic hypotension, while too little can lead to the return of Parkinson's symptoms.

Considering the critical role of optimum level of L-dopa in therapy, it is essential to develop a simple, cost-effective, sensitive, and quick method for monitoring L-dopa in biological fluids.

The sensor made by coating a silk-fibroin protein nano-layer, derived from Bombyx mori silk cocoons, onto the surface of reduced graphene oxide nanoparticles.