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INST develops low cost method for producing antiepileptic drug Rufinamide

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The new method promises to overcome many of the current challenges in the synthesis of Rufinamide drug



Scientists at Mohali based Institute of Nano Science & Technology (INST), an autonomous institute of the Department of Science and Technology (DST), Govt. of India, have developed a nanotechnology-based industry-friendly and low-cost method for the production of antiepileptic drug ‘Rufinamide’.

Dr. Jayamurugan Govindasamy and his co-workers from INST have developed a new recyclable copper-oxide catalyst, which plays a crucial role in the key reaction for producing the Rufinamide drug.

The existing technology for producing the drug has an inherent selectivity issue, which often leads to unwanted non-drug isomer ---1, 5-regioisomer.

This necessitates the use of organic solvent, high temperature, and the need to purify and separate the soluble catalyst and so on, leading to unfriendly reaction conditions and high production costs.

In the new production method published in the journal Chemical Communications, unlike the traditional $CuSO_4$ catalyst, the newly designed catalyst comprising of very small-sized (3-5 nm) Cu^{I} and Cu^{II} is so reactive that the reaction can be conducted efficiently under the aqueous condition and at room temperature. Since the catalyst is coated with slightly modified natural bio-polymer, they are biocompatible and can be separated just by filtration technique.

The new method promises to overcome many of the current challenges in the synthesis of Rufinamide drug such as high cost, the formation of unwanted 1,5-regioisomer in addition to the required 1,4-regioisomer, limited choice of starting materials (propiolic acid derivatives) leading to multistep synthetic sequences, and poor yields due to use of organic solvents and overheating of the reagents.