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A silky idea drives innovation

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Maumita Bhattacharjee and Sannidhi Jhala, winners of the Young Innovator prize, receiving a cheque of Rs. 10 lakh from Rajeev A. Vaidya, DuPont president for South Asia and ASEAN

Using silk fibres, two young women have devised a method to regenerate vertebral discs, thus providing a cheaper remedy for back pain

A silky idea promises to provide a smooth way out for lower-back pain. A student of IIT Delhi has come up with a novel idea of using silk fibres, developed through a silk-winding machine, to regenerate the Inter Vertebral Disc (IVD) in the spinal column, thus bringing huge relief to the rapidly growing tribe of patients suffering from back pain.

What differentiates fibres produced through this machine from existing treatment modalities is that these fibres restore the normal biological and mechanical properties of the human spine, says Maumita Bhattacharjee, a Ph.D from IIT Delhi and one of the two who came up with the idea.

Along with Sannidhi Jhala, a management student at ISB Mohali and hailing from Hyderabad, Maumita submitted the idea at a Young Innovator competition organised by DuPont recently, in the process winning a cash prize of Rs. 10 lakh. The duo also got an opportunity to visit the DuPont Headquarters in Wilmington, Delaware, USA.

The competition attracted the best young minds from science, technology and business schools of India to come together and showcase ground-breaking innovations and their go-to-market strategies across key sectors like energy, safety and sustainability, food and agriculture, healthcare, nutrition and infrastructure and presented business plans on these ideas.

“Several attempts were made to engineer the IVD tissue using a variety of chemical compositions and scaffold architectures but the silk-fibre based bio-materials produced by my machine simulate the precise anatomical orientation of fibres in outer IVD layer and match its stiffness,” claims Maumita.

“We sold the idea to several orthopaedics and they are pretty excited about it. It is much cheaper than the present alternatives where ceramic and metallic prosthetic discs are used in the surgery,” says Sannidhi, who designed the marketing strategy for the product.

“The metal disc costs about Rs. 4 lakh while silk disc will cost around Rs. 30,000,” she says.

Maumita designed the winding machine using stepper motors and decks from old broken tape recorder.

“The machine facilitated alignment of silk fibre at an angle of approximately 30 degree in one layer and oriented in opposite direction in successive layers that represent orientation of fibres in the IVD layer.”

The young researcher points out that the biomaterials developed by this machine mimic the natural body mechanism with regard to flexibility and is a better solution compared to the current treatment modalities. The results in the lab conditions have been highly successful and the effort is on to test it on the animals.

“We need at least two years for the idea to become operational,” she says and sounds quite confident of changing the lives of people suffering with lower back pain.