Inviting
Expression of Interest (EoI)

No. TBD/5/2020 8th September 2020

Sree Chitra Tirunal Institute for Medical Science and Technology (SCTIMST), an Institute of National Importance under Department of Science & Technology, Government of India is engaged in Research and Development of Medical Devices and Biomaterials. SCTIMST has a track record of transferring technologies to industries that have become commercial successes.

SCTIMST is now seeking Expression of Interest from companies which are interested in technology transfer/ collaborating with Institute to further develop and commercialize the following :

1. **FIBRIN WAFER for local delivery of Curcumin (US Patent Granted)**
2. **MECHANICAL VENTILATOR**

The current status of the projects are given as follows:

1. FIBRIN CURCUMIN WAFER (FCW) *for* local delivery of Curcumin

Granted US Patent No. 10004698 in the name of SCTIMST and ICMR

Anti Cancer and anti-inflammatory properties of curcumin are well established and published in literature. Curcumin delivery in tissue could prevent cancer metastasis and inflammation. Local curcumin delivery can prevent side effects of cytotoxic curcumin from causing damage to other healthy tissues.

Intended Application: Fibrin curcumin wafer (FCW) is intended for sustained local delivery of curcumin into the surrounding tissues after surgical removal of tumor.

Product Description: It is freeze dried fibrin wafer loaded with curcumin and fabricated in ready-to use form. Freeze dried fibrin induces hemostasis and prevents excessive bleeding from surgical injuries. It adheres to surgical tissues and gets degraded in few days/weeks depending on the wafer density. As fibrin degrades, sustained release of curcumin causes apoptosis of cancer cells in the surrounding tissue. The curcumin dose is variable, based on loading concentration per unit volume and size of wafer. Alternatively, the composed fibrin curcumin hydrogel (FCH) can be delivered in tissues by injection and the curcumin can undergo sustained release from the clot.

FIBRIN CURCUMIN WAFER (FCW) *for* local delivery of Curcumin

Novelty of the product:

It is a product with dual functions: (i) Induce hemostasis and (ii) Facilitate sustained release of a proven drug in soluble form. It is fabricated using clinical grade human proteins in a stable, ready-to-use form; therefore, the drug carrier is safe for human use.

Status of Patent:

U S Patent Granted with Number 10,004,698, Fibrin wafer/disc as a biological carrier for sustained delivery of curcumin on June 26, 2018

Applicants: SCTIMST and Indian Council of Medical Research (ICMR), New Delhi

Indian patent Application filed No 1516CHE-2013

FIBRIN CURCUMIN WAFER (FCW) *for* local delivery of Curcumin

Current Stage of Development

- Standardized the fabrication process of the product in variable size and dose.
- Proven curcumin release into cancer cell culture medium and apoptotic action
- Established safety and immunomodulation upon local implantation (IP) in mice
- Established effective prevention of tumor (DLA -Ascites) progression upon IP delivery in tumor induced mice
- Established effective reduction of developed tumor (DLA- Ascites); both volume and tumor cell numbers upon IP implantation
- Technology Readiness Level- 4 (Proof of Concept stage)

Further work to be carried out:

- Pharmacokinetics in animal models to demonstrate bioavailability in solid tissues upon surgical implantation of FCW and upon injecting FCH (Fibrin Curcumin Hydrogel)
- Evaluate effectiveness of both FCW and FCH in suitable cancer models
- Identify the dose requirement for specific cancer type
- Obtain Test License for product/package validation
- Obtain Regulatory approvals for clinical trials
- Conduct clinical trial
- Obtain regulatory approval for manufacturing and marketing

2. MECHANICAL VENTILATORS (Turbine based)

- The current COVID 19 pandemic has highlighted the need for large number of mechanical ventilators worldwide. In spite of several initiatives in this regard, there is an opportunity for developing a well designed, tested, reliable yet affordable ventilator for use beyond COVID 19
- Therefore, SCTIMST has initiated development of two models of ventilators to meet the above objectives
- These are turbine-based mechanical ventilators
- First model is a handy, portable ventilator for emergency use in ambulances, public places etc. The features include TFT display, variable tidal volume, respiratory rate-control, SIMV respiratory rate, PEEP, pressure support/PC level, breath cycle time (SIMV), I:E ratio, O2 concentration, pressure trigger etc.
- The second model is a more sophisticated, general purpose ICU ventilator with all essential features like variable tidal volume, respiratory rate-control, SIMV respiratory rate, PEEP, pressure support/PC level, breath cycle time (SIMV), I:E ratio, O2 concentration, pressure trigger etc. for both adult and paediatric use. This will have touch screen display, validated software, trolley for mounting etc.
- Both are in early stages of development and likely to complete Proof Of Concept (TRL-3) by end of 2020.

Expression of Interest (EoI) is invited from Indian companies /startups who are interested in technology transfer/ collaborating with Institute to further develop and commercialise the products.

Applicants are expected to have relevant technical team and ability to invest in the projects or raise funds, carry out further evaluations, produce prototypes, conduct testing and evaluations, obtain regulatory approvals, set up manufacturing with ISO 13485 quality system and marketing capabilities.

For further information,

Please write to Technology Business Division on email: **tbd@sctimst.ac.in**

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The last date for submission of EOI is 30 September 2020