

# APPLICATION FOR TECHNOLOGY TRANSFER

University of Kerala  
Thiruvananthapuram

Name of the inventor(s): Dr. Josna Joseph

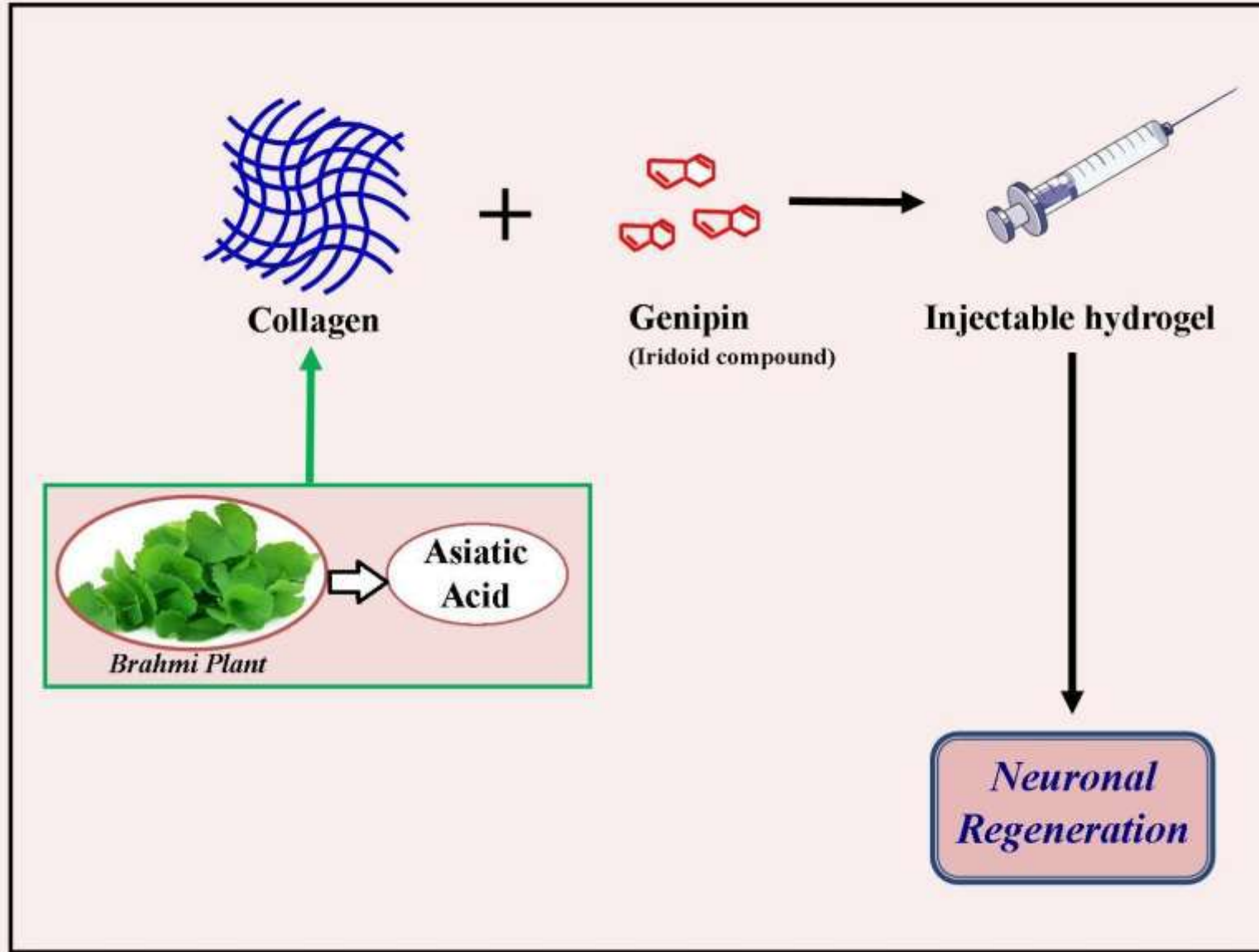
Name of the invention: **ASIATIC ACID LADEN HYDROGELS FOR NEURAL TISSUE ENGINEERING**

Patent Application & priority date : 201941053472 dtd. 23-12-2019  
/ Patent Number & date of patent: NA

## Brief description of the invention (Abstract): (1-2 sentences)

- In this study we are proposing a combinatorial approach of co-administering phytochemical with neuroregenerative potential (Asiatic Acid) along with injectable biopolymer hydrogels to the site of injury.
- The proposed phytochemical incorporated hydrogels, with their inherent capacity for directing stem cells to sites of nerve damage would be efficient tools in the hands of neurosurgeons.
- This study employing injectable hydrogels along with easily available, economic, non-toxic formulation of phytochemical component, is a confluence of indigenous resource with cutting edge technology.

# Graphical abstract:



## Novelty of the invention:

- The process is unique by exploiting the abundantly available extra cellular matrix material, collagen and by the adaptation of eco-friendly synthesizing method (plant irridoid, genipin as the cross- linking agent) and by the choice of traditionally well-effective phytochemical, Asiatic Acid for incorporation in the hydrogel.
- attempt to incorporate the standardized phytochemical to injectable in-situ gelling hydrogels in the application of Tissue Engineering is a novel concept in Indian biomedical field.

## Utility of the invention:

An ideal biomaterial matrix was developed for *in situ* drug delivery and endogenous stem cell recruitment.

**This technology, utilizing neurogenic phytochemical incorporated in situ-gelling injectable hydrogels, could lead to the development of economic indigenous treatment modalities for millions of stroke and spinal cord injury patients in India.**



## Non-obvious nature of the invention:

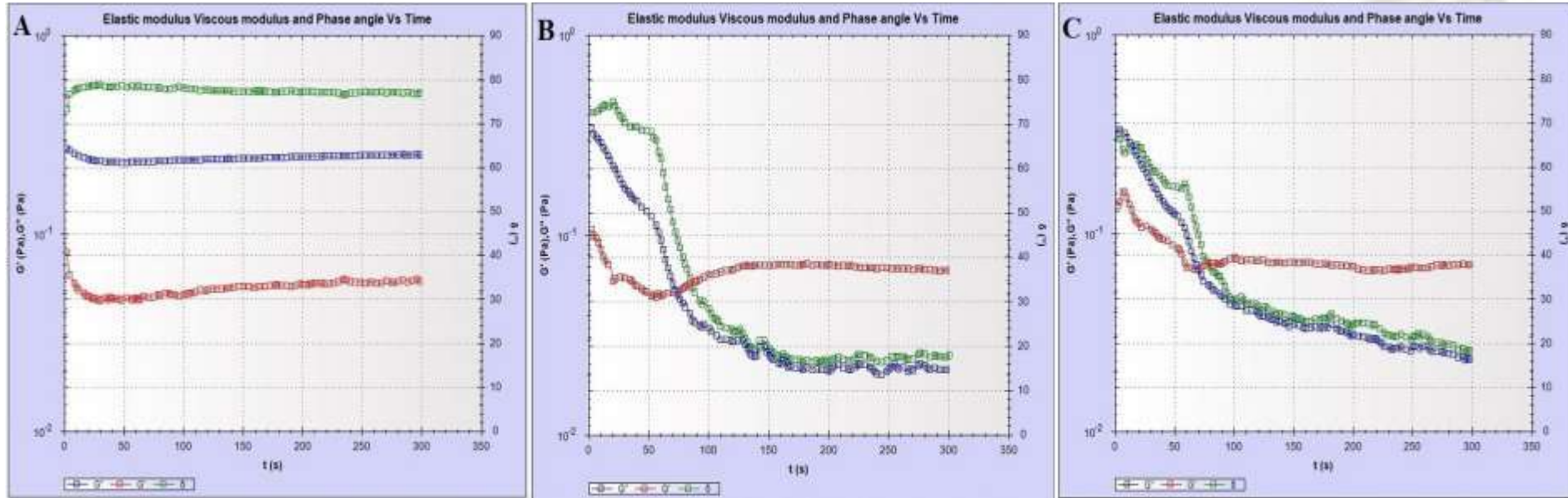
We claim:

1. The local functional moiety, Asiatic acid laden hydrogels could replace growth factor laden injectable hydrogels for neural tissue engineering, as bioavailability and cost-effectiveness of the Asiatic Acid, a compound derived from a local medicinal plant, *Centella Asiatica* is more.

2. The active component, Asiatic Acid laden collagen- Genipin hydrogels have more efficacy in cell proliferation and differentiation than collagen-Genipin hydrogel alone, that this hydrogels be effective matrices for stem cell homing, proliferation and differentiation

As the biostability of growth factors are less, this much more stable phytochemical laden hydrogels products have more 'shelf life', when compared to its 'growth factor' counterpart.

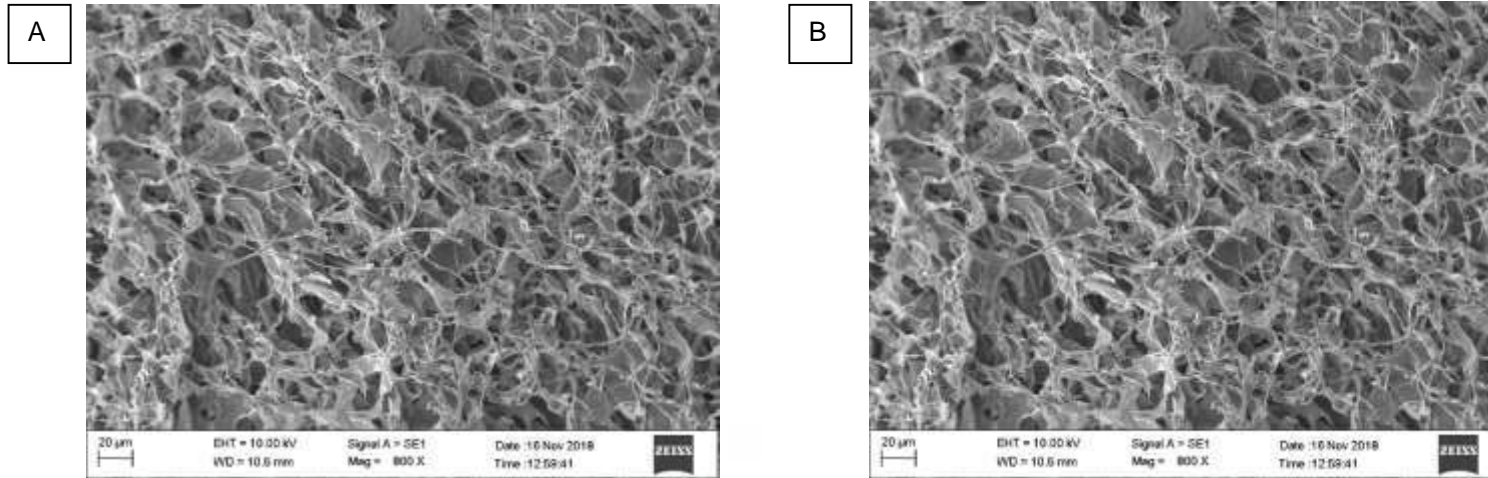
# Results: (proof for clause 1) Basic data only



**Fig.1. Rheological evaluation of initial gelation kinetics of Collagen-genipin hydrogels. A) Collagen solution alone B) Collagen- Genipin solution with gel point at 72 sec C) Collagen- Genipin solution with PC1 addition showing no significant change in gelation time after drug addition.**



# Results: (proof for clause 2) [Add more slides if required]



**Fig.2. Scanning Electron microscopy images of Collagen (A) and Collagen-Genipin(B) Hydrogels**

Clauses applied for /protected (for granted patents):  
NA



## Fields where the invention finds application:

- Post thrombectomy for neural regeneration in cerebral ischemia (stroke) patients
- Post spinal cord surgery in trauma patients

Whether the work has been published: **No**

(Authors, year, title of publication, Journal name, volume, page no)



Contact us @  
[tricku@keralauniversity.ac.in](mailto:tricku@keralauniversity.ac.in)

