

## **Declaration by Research Scholar Originality of Research Work**

I declare that thesis entitled “*Attenuation of drug induced liver toxicity by targeted therapy*” is my own work conducted under the supervision of **Dr. Debashis Banerjee**. at Department of **Biotechnology**, Faculty of Science, Atmiya University, Rajkot, Gujarat, India and approved by the Director of Research.

I further declare that to the best of my knowledge the thesis does not contain any part of any work which has been submitted for award of any degree either in this University or any other University without proper citation.

Date:

Place:

**Signature of the Candidate**

(Brijesh Kumar Verma)

## Certificate of Supervisor

This is to certify that work entitled “*Attenuation of drug-induced liver toxicity by targeted therapy*” is a piece of research work done by **Brijesh Kumar Verma** under my supervision for the degree of Doctor of Philosophy in Department of **Biotechnology**, Faculty of Science, Atmiya University, Rajkot, Gujarat, India

To the best of my knowledge and belief the research work and thesis

- I. Embodies the work of candidate himself / herself,
- II. Has duly been completed,
- III. Fulfils the requirement of ordinance related to Ph.D. degree of the University &
- IV. is up to the standard both in respect of content and language for being referred to the examiner.

Date:

Place:

Signature of Research Supervisor

(Dr. Debashis Banerjee)

## Thesis Approval Form

The Viva-Voce of the Ph.D. thesis entitled “*Attenuation of drug-induced liver toxicity by targeted therapy*” submitted by Brijesh Kumar Verma (Enrolment No.: 210681004) was conducted on \_\_\_\_/\_\_\_\_/\_\_\_\_ (\_\_\_\_\_) at Atmiya University, Rajkot, Gujarat

Based on the Performance of the Candidate, We, the panel of examiners, recommend that

(Please tick any of the following)

1. He / She be awarded Ph.D. Degree
2. The following modifications are to be incorporated in the thesis within one month and viva-voce be re-conducted by the same panel of examiners

Please Suggest Modification

3. He / She should not be awarded Ph.D. Degree

Please mention Reason for Rejection

Date:

Place:

|           |                     |                    |                   |
|-----------|---------------------|--------------------|-------------------|
| Signature |                     |                    |                   |
|           | Research Supervisor | University Nominee | External Examiner |

## **Declaration by Research Scholar**

### **Submission of Thesis**

I declare that the submitted thesis entitled “*Attenuation of drug-induced liver toxicity by targeted therapy*” incorporates

1. All the suggestions / directions / modifications / additions / deletions received from the supervisor and the external examiners through their thesis evaluation reports.
2. All the suggestions / directions / modifications / additions / deletions received from the panel of examiners during the public viva-voce (Open Defence) conducted on \_\_\_\_/\_\_\_\_/\_\_\_\_.

Date:

Place:

Signature of the Research Scholar

(Brijesh Kumar Verma)

## Acknowledgement

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This thesis not only represents academic achievement but also the collective efforts of everyone who has been a part of this journey.

Thank you all for your contribution to my academic growth.

Signature of the Research Scholar  
(Brijesh Kumar Verma)

## Abbreviations

| Abbreviation |   | Full Form                                |
|--------------|---|--|
| ALT          | : | Alanine Aminotransferase                 |
| AST          | : | Aspartate Aminotransferase               |
| AXN          | : | Astaxanthin                              |
| CMP          | : | Chloramphenicol                          |
| DILI         | : | Drug-Induced Liver Injury                |
| GSH          | : | Glutathione                              |
| HepG2        | : | Human Hepatocellular Carcinoma Cell Line |
| MD           | : | Mitochondrial Dysfunction                |
| MDA          | : | Malondialdehyde                          |
| NO           | : | Nitric Oxide                             |
| QRN          | : | Quercetin                                |
| RNS          | : | Reactive Nitrogen Species                |
| ROS          | : | Reactive Oxygen Species                  |
| SOD          | : | Superoxide Dismutase                     |
| TFAM         | : | Transcription Factor A, Mitochondrial    |
| UCP2         | : | Uncoupling Protein 2                     |
| WHO          | : | World Health Organization                |