

Review Report on PhD Thesis

Faculty: **Central European Institute of Technology**
Brno University of Technology in Brno

Academic year: **2017/2018**

Student: **Ing. Lukáš Zubal**

Doctoral study program: **Advanced Materials and Nanosciences**

Field of study: **Advanced Materials**

Supervisor: **Doc. Ing. Lucy Vojtová, Ph.D.**

Reviewer: **Prof. Claudio Migliaresi**

PhD thesis title: **Atelocollagen processing, gelation and characterization**

Topicality of doctoral thesis:

The thesis discusses the dissolution of atelocollagen in low pressure CO₂ water solutions, and its assembling with the formation of gels. Structure and properties of the dissolved and regenerated collagen are deeply examined and discussed.

Meeting the goals set:

Sorry, this question is not clear to me, and my comments could be not appropriate or the required ones.

The declared goal of the thesis is the optimization of a method to dissolve soluble collagen in water/carbon dioxide solution at low temperature, without inducing its denaturation and with the preservation of its microfibrillar structure. The goal has been fully achieved.

Problem solving and dissertation results:

The scientific results of the thesis are undoubted, and this is confirmed by the fact that the thesis originated to papers in major scientific journals. The thesis is full of results, tables, figures, references from the literature, and this evidences the interest of the candidate as well his acquired knowledge of the field.

Some sentences of the introduction should be better clarified (scaffolds or transplants, interaction between cells and materials at the surface or inside or with micro-nanofibers, the possible applications of the investigated material for TE).

Very accurate and outstanding is the part that refers to dissolution, to the characterization and to the regeneration of collagen gels from solutions. Many techniques have been used, and their results well discussed and compared.

Importance for practice or development of the discipline:

Use of the regenerated gels for TE is theoretically possible, however biological and also commercial advantaged should be proved.

The scientific impact or relevance of the achieved results is well proved in the second part of the thesis, and many theoretical basic concepts are recalled and well linked with the experimental results.

Formal adjustment of the thesis and language level:

The language is not always perfect, the syntax is in some parts a bit convoluted.

Questions and comments:

Make specific examples of potential applications of the regenerated gels.

Do soluble and insoluble collagen have specific different biological or physical roles in the body?

How the results could be transferred to practical use

Conclusion:

In my opinion, the reviewed thesis fulfills all requirements posed on theses aimed for obtaining PhD degree. This thesis is ready to be defended orally, in front of respective committee.

In Trento, May 29th, 2018

Prof. Claudio Migliaresi