

*Confidential***Review of USB RIFCH PhD Thesis**

Surname of the PhD student: Ing. Martin Pšenička	Name of supervisor: prof. Ing. Otomar Linhart, DrSc.
Title of PhD thesis: Ultrastructure of spermatozoa and fertilization process in sturgeon	
<b>REVIEWER:</b>	
Surname: Pěkníková	Institution: Institute of Biotechnology AS CR, v. v. i. Videnska 1083 142 20 Prague 4
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Please describe your professional relationship to the PhD student: He visited our laboratory within frame of cooperation.	Please describe your field of expertise: Reproductive biology, mammalian fertilization, role of selected sperm proteins in sperm/zona pellucida binding

**QUESTIONNAIRE*****Originality, scientific importance, prospects of the PhD thesis and benefits for basic or applied research***

Evaluate its competitiveness in the international context and compare its level with the current state of the art in the field:

The aim of PhD Thesis was to characterize spermatozoa and fertilization process in sturgeon. Sturgeon spermatozoa differ from other sperm fish mainly by the presence of acrosome in spermatozoa. The acrosome is important part of head sperm in mammalian spermatozoa, so it was interesting compare ultrastructure of fish and mammalian sperm. The results in PhD Thesis are important not only for detailed study of sturgeon sperm but also for the importance of this vesicle in the phylogenesis.

The results are in the context of the global science and are essential for basic scientific knowledge.

***Preparation of the PhD thesis, targets of the work and deliverables***

Evaluate the overall level of preparation of the PhD thesis and the originality of the selected approaches; evaluate publications and whether the targets set in the PhD thesis correspond with the declared purpose of the thesis:

The PhD thesis is standard structured on Introduction, specific chapters (describing morphology and ultrastructure of sturgeon sperm, acrosome localization, detection of acrosome and sperm motility after cryopreservation, fertilization process and prevention of polyspermy) and at last General Discussion.

The aims of work are brightly defined, experiments attentively performed and results are precise documented.

All aims are detailed discussed in the General Discussion.

PhD thesis is in context with 68 references in the Introduction and 57 in the General Discussion and other references are in the own publications.

I advise this PhD thesis to affiliation, therefore is satisfactory for the conferment of the title PhD.

**OVERALL COMMENTARY ON THE PhD THESIS**

The overall aim of present PhD thesis submitted by Martin Pšenička, was describe ultrastructure of sturgeon spermatozoa, function of their acrosome and process of fertilization. Specific objectives describe the ultrastructure of sturgeon spermatozoa, monitor of acrosome reaction, test influence of cryopreservation on viability, motility and acrosome integrity of sturgeon spermatozoa and study of the acrosome in fertilization process and prevence of polyspermy.

My questions concern the function of acrosome, acrosomal proteins and methods of cryopreservation.

1. Do you know if acrosomal proteins involved in the process of fertilization?
2. They have proteins sturgeon acrosome same function as mammalian acrosome proteins in the process of fertilization?
3. Do it exist acrosin-like protein in the sturgeon fish acrosome?
4. Can you explain the loss of acrosome in Teleostei?
5. Can you explain the differences in cryopreservation between methanol and DMSO?
6. Why DMSO induces acrosome reaction in contrast to methanol?

In the end, important comments. Martin Pšenička is author or co-author of 18 publications, other two are submitted and has two publications in the Bulletin (RIFCH).

The PhD thesis exceeds the requirements for the submission of work for a PhD degree.

**FINAL RECOMMENDATION**

- can be recommended for defence of PhD Thesis  
 can be recommended with reservations for defence of PhD Thesis  
 can not be recommended for defence of PhD Thesis

2009-07-08, Prague

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Date and place

  
Pěkníková Jana

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surname and signature