

<b>Posudek na bakalářskou práci</b>	
<input type="checkbox"/> školitelský posudek <input checked="" type="checkbox"/> oponentský posudek	<b>Jméno posuzovatele:</b> Marketa Kaucka Petersen, PhD. <b>Datum:</b> 10.05.2022
<b>Autor: Andrea Burianová</b>	
<b>Název práce:</b> Genetic regulation of the cranial cartilage and bone development Genetická regulace vývoje hlavových chrupavek a kostí	
<input checked="" type="checkbox"/> Práce je literární rešerší ve smyslu zveřejněných požadavků (pravidel). <input type="checkbox"/> Práce obsahuje navíc i vlastní výsledky.	
<b>Cíle práce (předmět rešerše, pracovní hypotéza...)</b>  The thesis aimed to review the current knowledge in craniofacial development, focusing on skeletogenesis.	
<b>Struktura (členění) práce:</b> The author introduced the topic by acknowledging the complexity of craniofacial development and mentioned that tight regulation of genetic, molecular and cellular processes is required to build up the intricate structure of the head skeleton. Here, the author defined the goals: to review cellular sources, GRN/molecular machineries in the skeletogenesis, and pinpoint several inter-species differences. This is followed by a second chapter discussing the properties and behaviour of neural crest cells. The author continued with a short part discussing the boundaries of cell contributions of different embryonic origins. Subsequently, two more extensive chapters describe the steps of cartilage and bone formation and underlying molecular signaling. A short conclusion highlights the recent technological advances that contributed to this field's research achievements but again underlines the complexity and need for further investigations.	
<b>Jsou použité literární zdroje dostatečné a jsou v práci správně citovány? Použil(a) autor(ka) v rešerši relevantní údaje z literárních zdrojů?</b>  The author listed over 120 citations, most well-known in the field and published in respected scientific journals. The selection of literature is reasonably appropriate.	
<b>Pokud práce obsahuje (nadstandardně) i vlastní výsledky, jsou tyto výsledky adekvátním způsobem získány, zhodnoceny a diskutovány?</b>  The thesis does not contain any own results.	
<b>Formální úroveň práce (obrazová dokumentace, grafika, text, jazyková úroveň):</b>  The text is very well written and organized, the provided information is relevant to the topic, and the thesis contains nearly no mistakes. The author introduced eight figures: 3 adopted from other publications and five designed using Biorender. The figures are primarily simple schematics but complement the text well.	
<b>Splnění cílů práce a celkové hodnocení:</b> While the thesis topic is quite broad, the goals formulated in the beginning are	

achieved. I do not have any major objections to the text/format/figures, information content or the overall organization. The student effectively communicated the basic knowledge in the field of craniofacial development and managed to provide understandable insight in the complex developmental process.

I acknowledge that the topic is very difficult to understand and, in the framework of bachelor thesis, it is impossible to be aware of all new discoveries. Therefore, I recommend this thesis for acceptance (and suggest grade "A ").

Otázky a připomínky oponenta:

Minor comments: the majority of citations (over 70%) are published before 2010 (incl), numerous transformative discoveries originated in the last decade. These new publications should have formed the majority of literature sources – many aspects of craniofacial development have been revisited.

Also, many times it has not been cleared about which species the author writes about. While many GRNs/molecules/pathways/processes are fairly conserved, it is obvious that their regulation led to – among others – to heterochrony and heterotopy and significantly altered the programs to generate the fascinating array of craniofacial shapes (as an adaptations to feeding styles, ecology etc).

Several information has been somewhat twisted (not being completely uncorrect, rather slightly misleading). For instance, trunk NCCs have shown to have skeletogenic potential in vitro only. On top of that, it has not been proved that the "NCC-controbution "does not, in fact, originate from Schwann Cells in targeted recruitment. Also speaking about chondro/osteo progenitor is not very precise as the cells specify very early. The truly joint progenitor would then been a mesenchymal-prespecified NCC. The description of endochondral bone formation fits rather the long bones, the craniofacial bones are very thin, thus the hypertrophy does not originate "in the center ". Such minor discrepancies can be found few times throughout the text, nevertheless, they do not decrease the quality of the thesis.

The research of craniofacial development and skeletogenesis requires detailed knowledge of genomic, molecular, cellular and developmental programs. I consider this topic challenging to summarize in such a short format as the bachelor thesis. As such, the work does meet my expectations of content and quality of a literature review at this career stage.

**Návrh hodnocení školitele nebo oponenta** (bude zveřejněn)

výborně  velmi dobře  dobře  nevyhověl(a)

Podpis školitele/opponenta:

*Kaučka' Peterseu*