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Title	Histological alteration of bone specific-blood vessels in murine long bones with intermittent PTH administration [an abstract of entire text]
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Description	この博士論文全文の閲覧方法については、以下のサイトをご参照ください。 https://www.lib.hokudai.ac.jp/dissertations/copy-guides/
Degree Grantor	北海道大学
Degree Name	博士(歯学)
Dissertation Number	甲第13877号
Issue Date	2020-03-25
Doc URL	https://hdl.handle.net/2115/78646
Type	doctoral thesis
File Information	Zhao_Shen_summary.pdf



学位論文内容の要約

Histological alteration of bone specific-blood
vessels in murine long bones with
intermittent PTH administration
(PTH 間歇投与によるマウス長管骨における
骨特異的血管の組織学的変化)

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Intermittent administration of parathyroid hormone (PTH) promotes preosteoblastic proliferation and differentiation into osteoblasts, which are coupled with osteoclasts, finally resulting in enhanced bone formation. Endomucin^{high}-positive bone-specific blood vessels have been reported to interact with osteoblastic cells to form new bones. However, it is still veiled whether PTH can affect the distribution of bone-specific blood vessels and other cell- types which surround the blood vessels. In this study, we have attempted to histologically examine bone-specific blood vessels after the intermittent PTH administration. Six weeks-old C57BL/6J mice received vehicle (control group) or 20 µg/kg/day of human PTH [1-34] (hPTH; PTH group) for 2 weeks. Mice were fixed with aldehyde solution, and the femora and tibiae were used for immunohistochemical analyses. Gene expression of the control and PTH-administered bone was examined by RT-PCR. In the control group, numbers of endomucin-positive/EphB4-positive blood vessels were observed, while few numbers of αSMA-reactive blood vessels were seen. After PTH administration, the numbers of endomucin-positive/EphB4-positive blood vessels increased, and the vascular diameters were markedly-expanded when compared to the control group. Of note, numbers of blood vessels which accompany αSMA-positive cells were increased in the PTH group, and were divided into two histologically distinct types: the blood vessels surrounded by ALP-reactive/αSMA-positive cells that were closed to the bone surface, and the blood vessels associated only with αSMA-positive cells that showed a long cell shape with extending thin cytoplasmic processes. To summarize, the intermittent administration of hPTH [1-34] may affect not only osteoblastic cells, but also bone-specific blood vessels.