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Gene expression of extracellular matrix proteins in lung metastases of giant cell tumour of bone: tumour or location specific?

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BACKGROUND
Giant cell tumour of bone (GCTB) is a primary bone tumour with an unpredictable clinical behavior which could sometimes be worrisome. One of these features is its ability to metastasize to the lungs. The mechanisms of this phenomenon have not been well understood. Recent studies indicate that the extracellular matrix may play a pivotal role in the primary tumor location to enhance its metastatic potential. Three of these reported genes are lumican (LUM), decorin (DCN) and tenascin which are all involved in the delicate balance between mobility and crosslinking of diverse components in the extracellular matrix.
AIMS
To investigate whether the expression of two of these ECM components - LUM and DCN as an example - are truly location specific (lung vs. bone) or tumour specific (metastasis and its primary tumour vs. non-metastasazing tumours).
METHODS
In total 31 samples of GCTB were used (5 primary, 6 lung-metastatic and 20 non-metastasizing GCTB samples). RNA extraction with cDNA synthesis and qPCR was performed in duplicate. Reference genes were selected and primers were designed against Lumican and Decorin using Primer-Blast, Oligo7 and mFold. The data were analyzed and using qBaseplus (Biogazelle). Statistical analyses were performed using the unpaired and paired t-test.
RESULTS
Comparison of the different gene expression profiles of LUM and DCN in the different GCTB-groups exhibits following results:
• no significant differential gene expression between lung meta's and their primary located tumours (DCN: $p < 0,804$. LUM: $p < 0,283$).
• A significant lower differential gene expression in the lung meta's compared to the non-metastasizing tumour samples (DCN: $p < 0,002$. LUM: $p < 0,001$)
• A significant lower differential gene expression of the metastasizing primary tumours when compared to the non-metastasazing tumour (DCN: $p < 0,003$. LUM: $p < 0,001$).

CONCLUSION
As the gene expression of both extracellular matrix proteins differs significantly between meta's and non-metastasizing tumours and between primary tumours compared with the non-metastasizing groups, proves that the expression of LUM and DCN is tumour specific. Moreover, a lower differential gene expression of these ECM genes is a potential indicator and therefore an alarm for those tumours at risk to metastasize.

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