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## CRUK Cambridge Centre MRes rotation project

Rotation Project Title	Differential gene expression in osteosarcoma
Head of Laboratory (PI) Name	<a href="#">Matthew Allen</a>
Second supervisor if applicable	N/A
Programme	<a href="#">Paediatric Cancers</a>
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Laboratory Location	<a href="#">Department of Veterinary Medicine</a>

<b>Project Outline</b>	<p><b><u>Aims and objectives</u></b></p> <p>The specific aim of this project is to develop <u>preliminary data</u> on the utility of a candidate “metastasis signature” to predict survival in osteosarcoma (OSA). Using a mouse model of canine OSA, we have identified 8 genes that appear to be associated with tumour metastasis to the lung. We hypothesise that this panel of 8 genes will allow us to discriminate between dogs that survived for &gt;12 months after diagnosis (“long-term survivors”) versus those that survived less than 12 months (“short term survivors”). These preliminary data will then be used to support an application for extramural funding to screen larger cohort of canine OSA cases (using tissues obtained from the <a href="#">Canine Comparative Oncology Genomics Consortium</a>) as well as human OSA specimens (to be obtained from clinical tissues collected from the 5 primary bone cancer surgical centres in England).</p>
<b>Experimental plan</b>	<p>This project will make use primary tumour material collected from 20 dogs with clinical OSA for which we have survival data. The expression of the 8 candidate genes will be quantified using real-time PCR and comparisons made between the two groups using supervised principal component analysis.</p>
<b>Main Techniques</b>	<ul style="list-style-type: none"> <li>• laser capture micro-dissection to isolate tumour tissue from FFPE sections of canine bone</li> <li>• isolation of RNA and synthesis of cDNA</li> <li>• real-time PCR using canine-specific primers</li> <li>• statistical analysis for compare expression patterns between the two groups</li> </ul>
<b>Key References</b>	<p><b>Margulies BS, DeBoyace SD, Damron TA, Allen MJ.</b> <i>Ewing's sarcoma of bone tumor cells produces MCSF that stimulates monocyte proliferation in a novel mouse model of Ewing's sarcoma of bone.</i> <i>Bone.</i> 2015;79:121-30.</p> <p><b>Chaffee BK, Allen MJ.</b> <i>A clinically relevant mouse model of canine osteosarcoma with spontaneous metastasis.</i> <i>In Vivo.</i> 2013;27(5):599-603.</p> <p><b>Lisle JW, Choi JY, Horton JA, Allen MJ, Damron TA.</b> <i>Metastatic osteosarcoma gene expression differs in vitro and in vivo.</i> <i>Clin Orthop Relat Res.</i> 2008;466(9):2071-80.</p>