



AN *IN VITRO* 3D BONE METASTASIS MODEL BY USING A HUMAN BONE TISSUE CULTURE AND HUMAN SEX-RELATED CANCER CELLS

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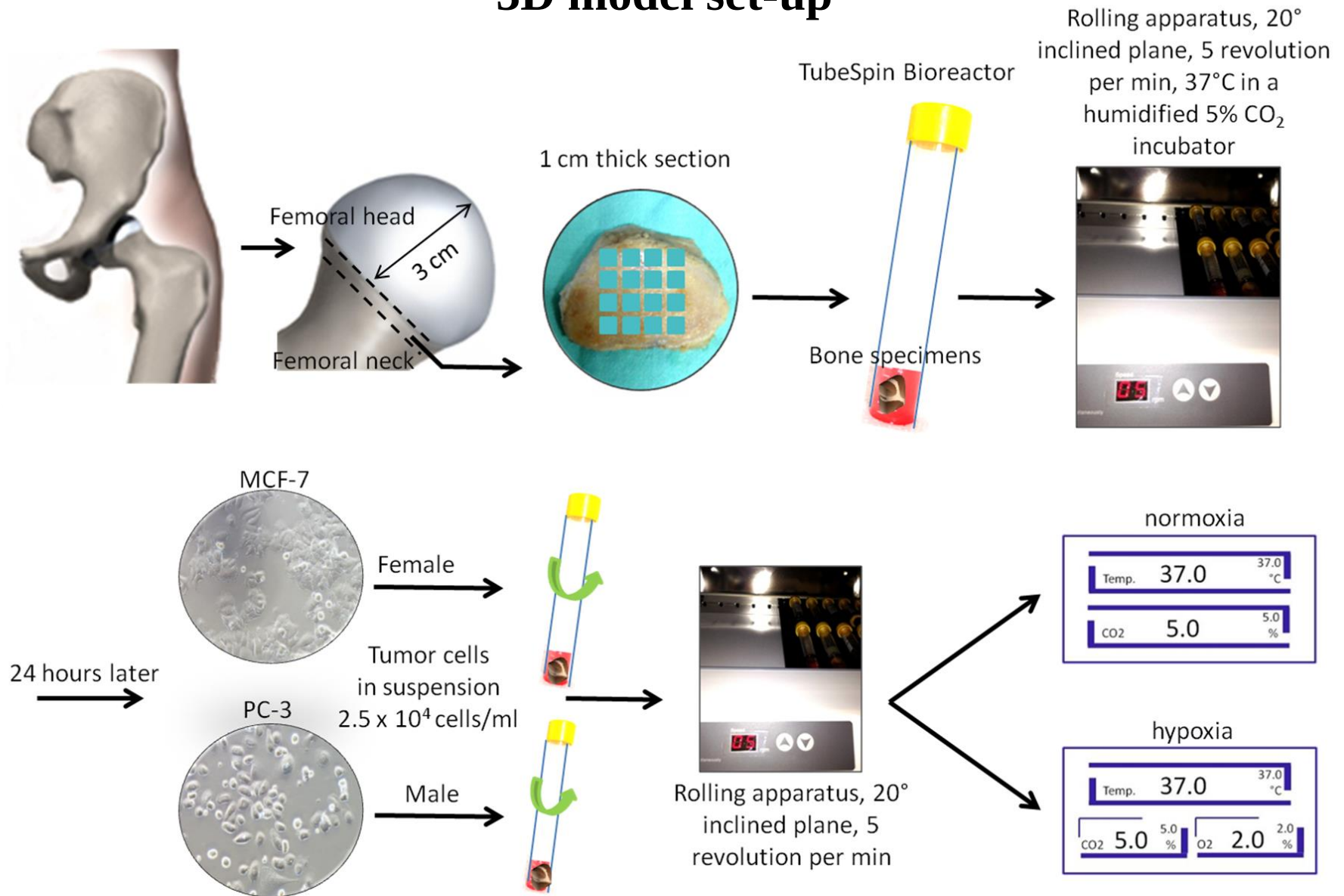
Laboratory of Preclinical and Surgical Studies, Rizzoli Orthopaedic Institute, Bologna, Italy.

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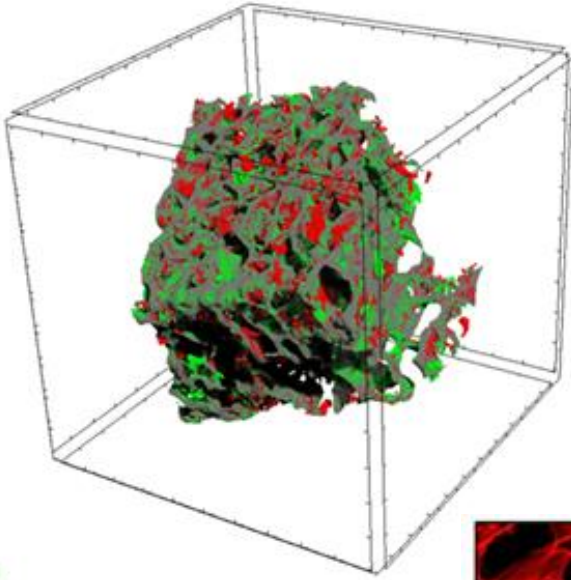
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3D model set-up



Micro-CT

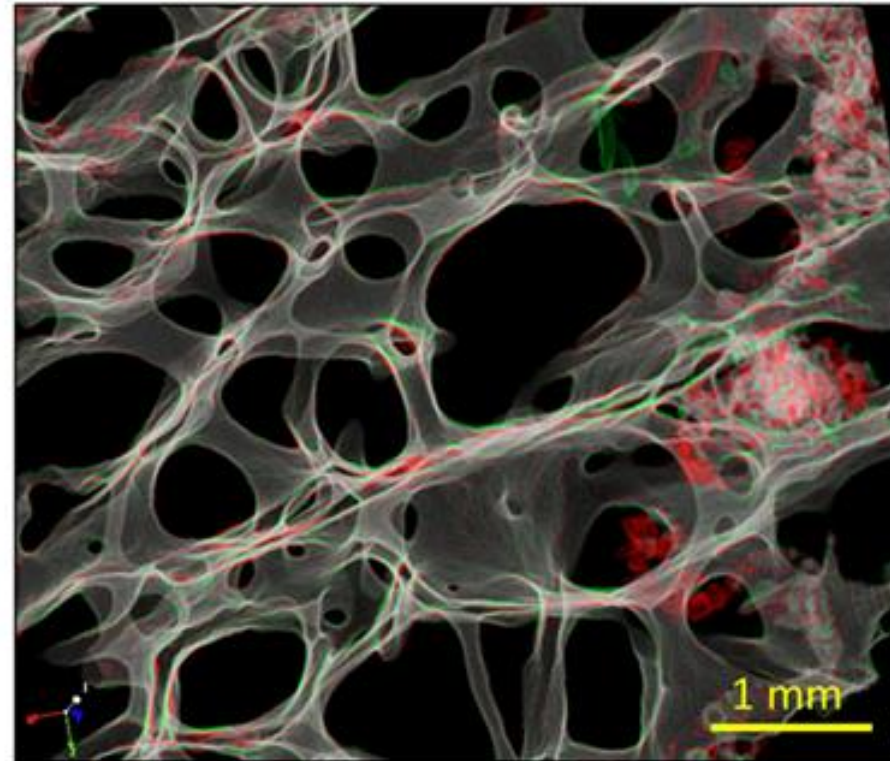
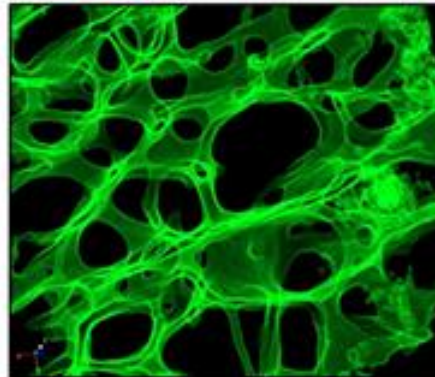
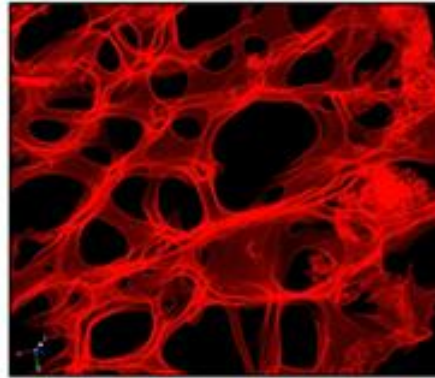


4D computational methodology



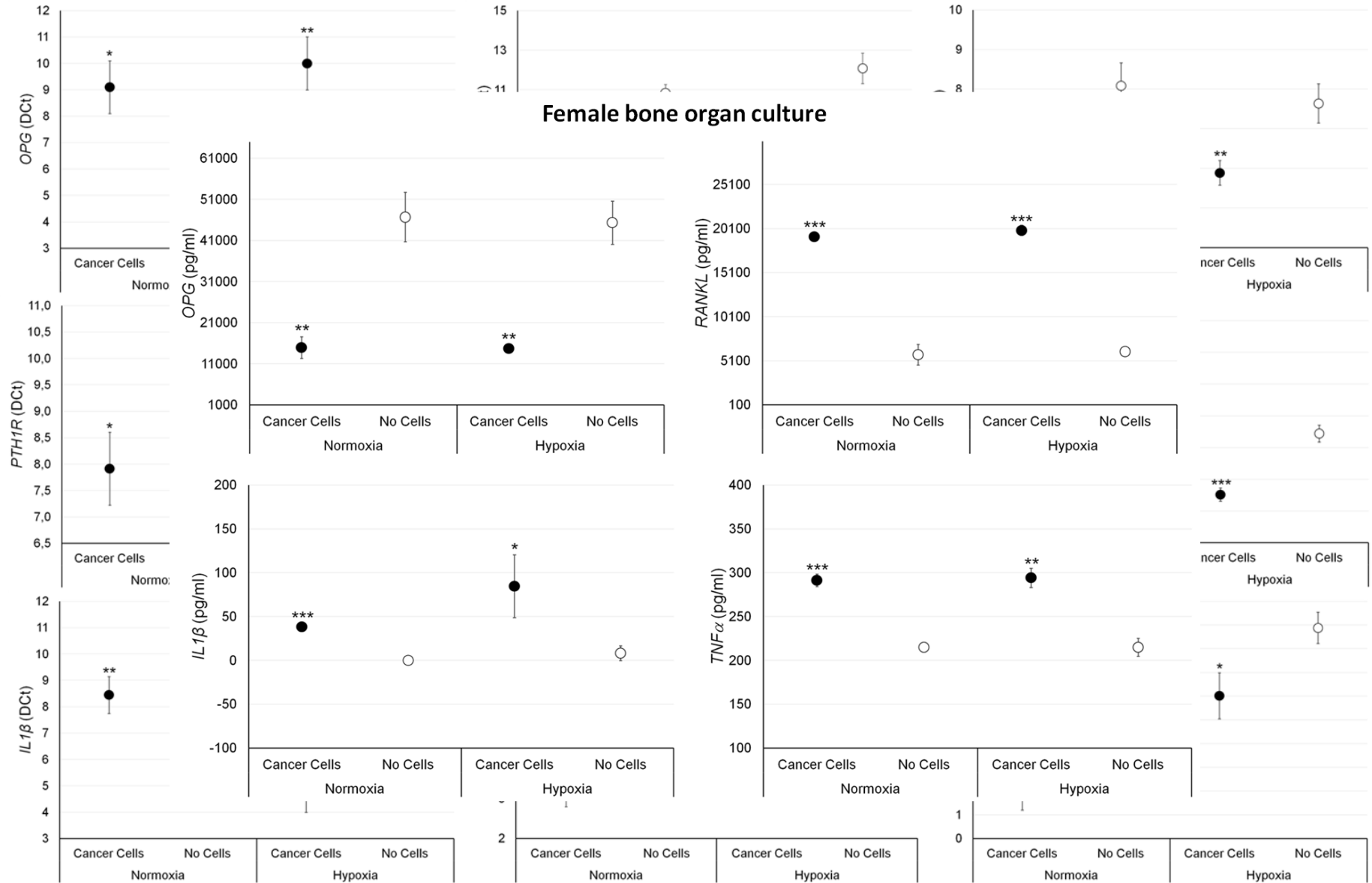
✓ Bone Mineral Density (BMD)

✓ Tissue Mineral Density (TMD)



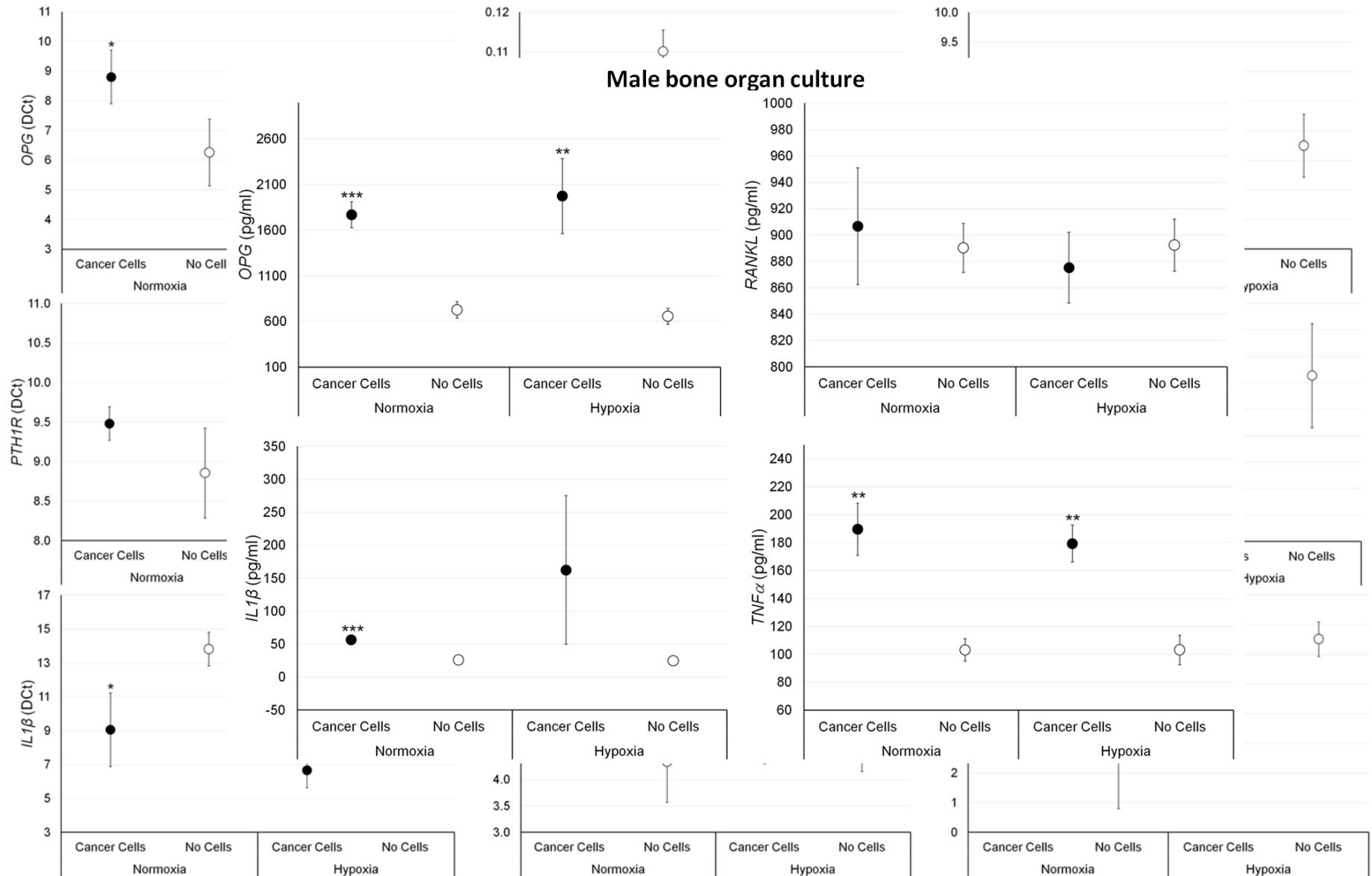
Gene and protein expression

Female bone organ culture



Gene and protein expression

Male bone organ culture

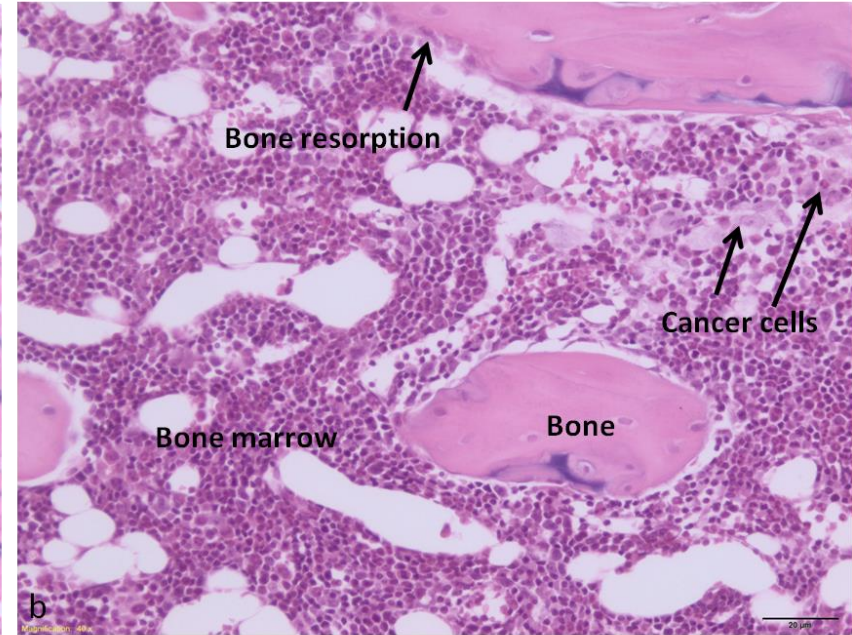
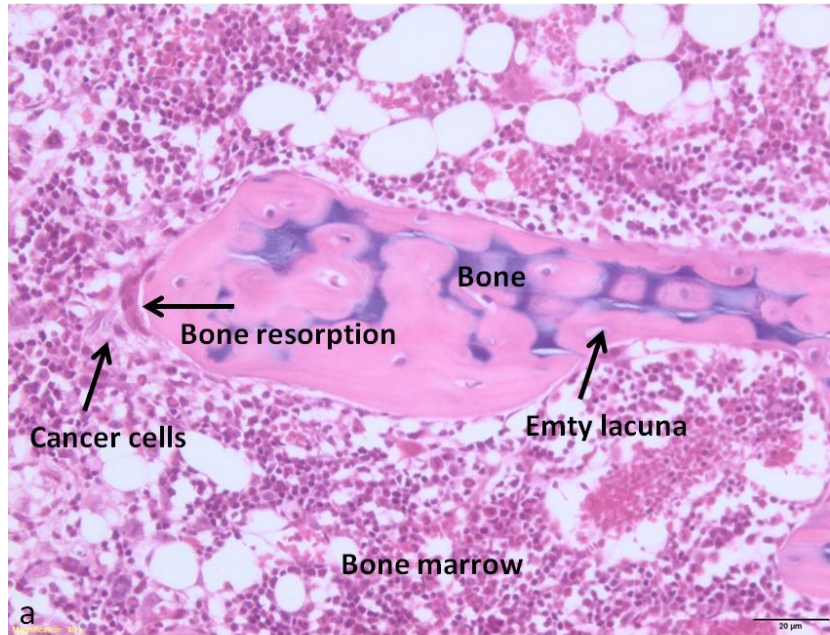


Histology

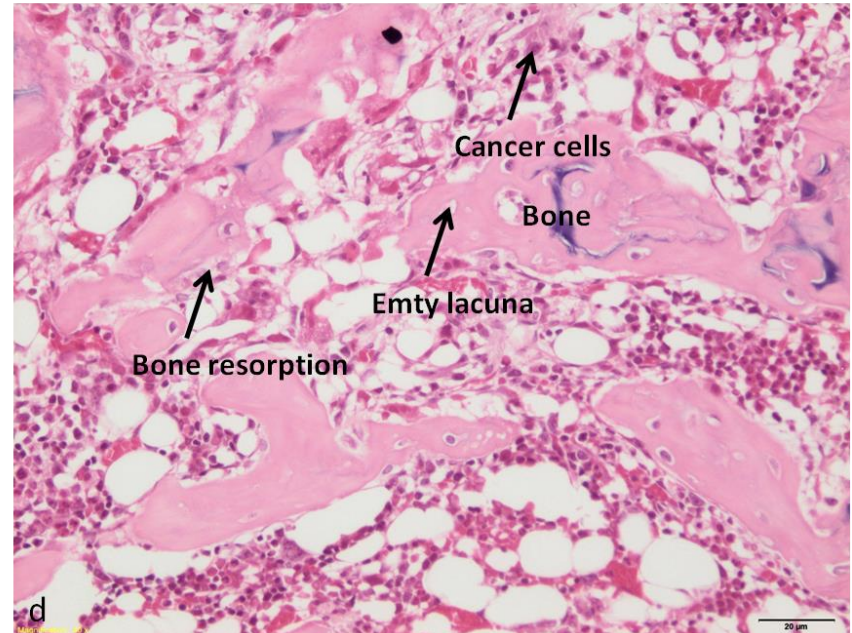
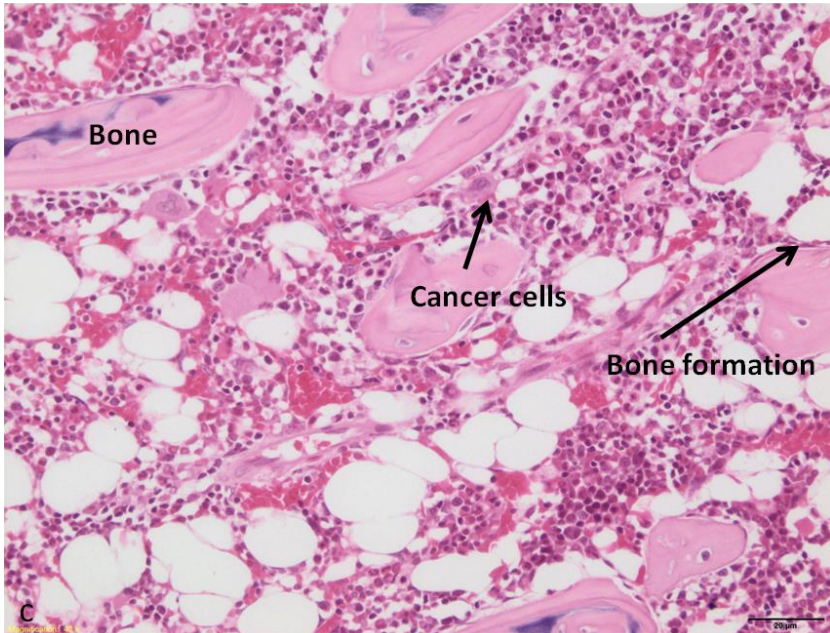
Normoxia

Hypoxia

MCF-7



PC-3

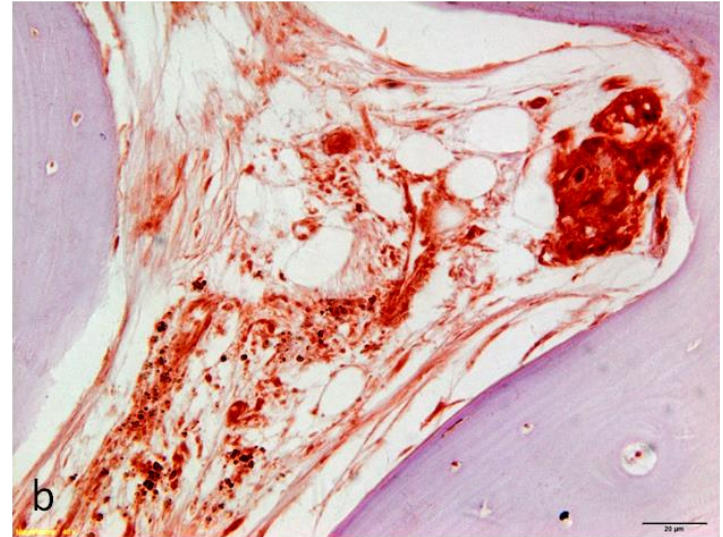
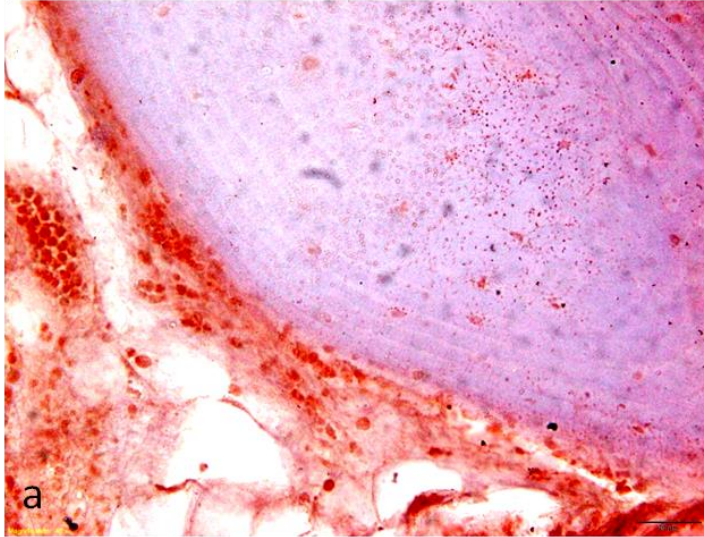


Immunohistochemistry

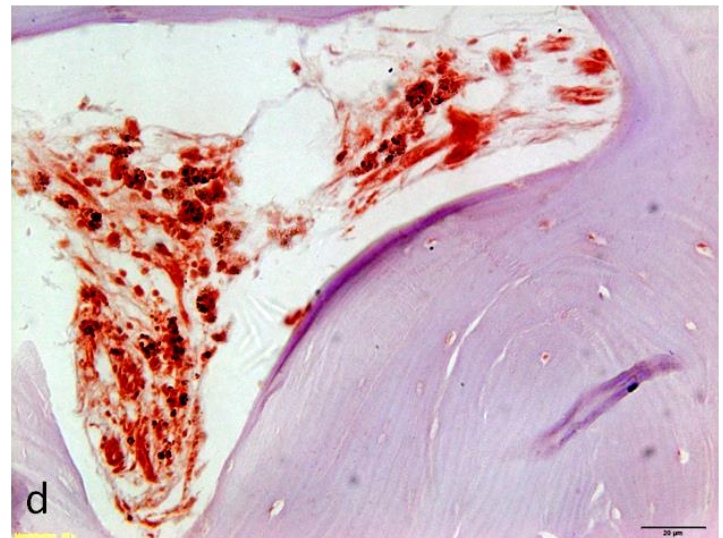
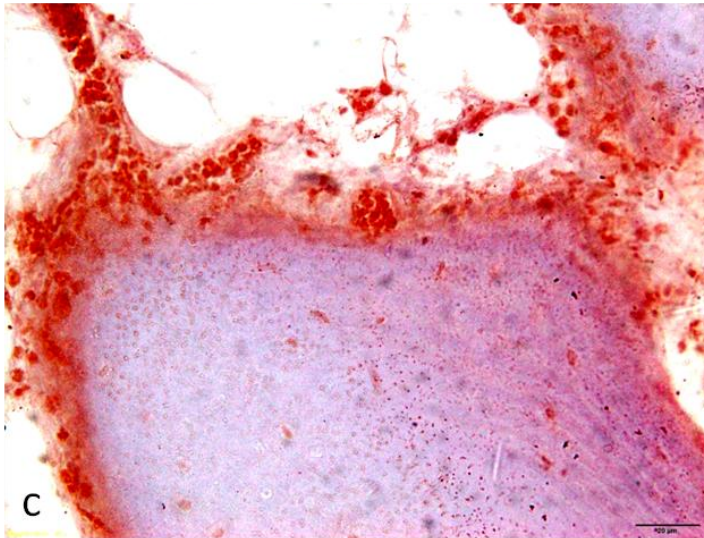
Normoxia

Hypoxia

MCF-7



PC-3



Conclusion

This dynamic 3D system supports the “*proof of concept*” for the application of this model for the recapitulation of *in vivo* cancer-bone metastasis spread, in particular monitoring and controlling hypoxia that seems to better mimic physiological tumors condition. In addition, this system also follow the 3R principles, the guiding principles, aimed at replacing/reducing/refining (3R) animal use and their suffering for scientific purposes.

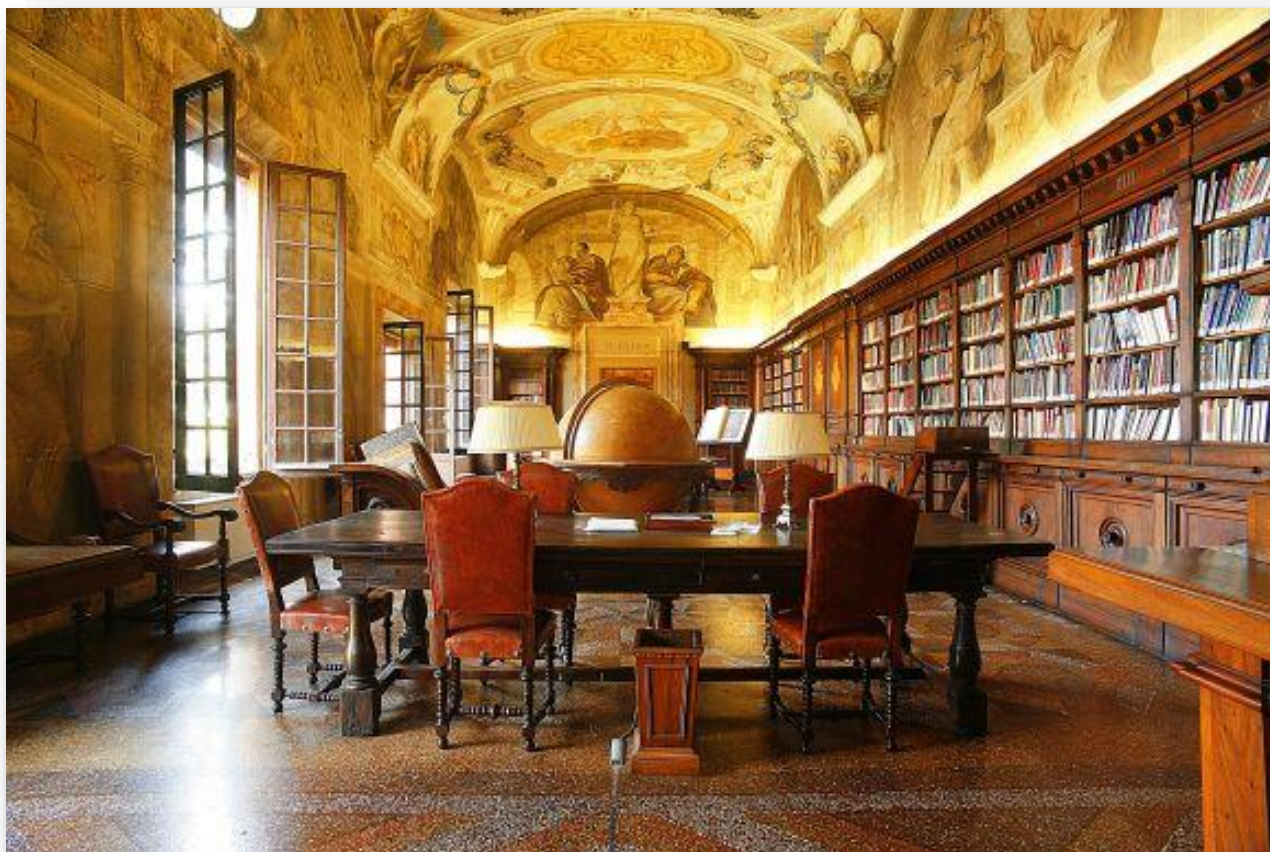




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thank you!

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