"Osteosarcoma, I have a bone to pick with you!" Small molecules for osteogenic differentiation of MSCs and the treatment of osteosarcoma.

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Making new bone Synthesised analogues can be used to induce osteogenic differentiation of MSCs for use in the treatment of damaged bones and osteodegenerative conditions like osteoporosis



Assessment of its biological activity in both breast and bone cancer cell lines indicate to its controlled ability to decrease cell viability with improved potency compared to Irosustat

Our findings Dexamethasone Bone cancer cells (MG63) Breast cancer cells (MCF7) What does this mean for patients? 140-140 rosustat (0.1µM) Cholesterol-based Drug repurposing – iability 120 120 cell viability inhibitor (0.1µM) Novel therapies which aim to a faster solution? 100 drive bone cancer cells to Apoptosis 100 Cell death death via the osteogenic % ~ 80 nmature Unprecedently, Irosustat is shown differentiation pathway)steoblast Osteoblast to be active in bone cancer cell 60 → Limit number of side effects lines Days of treatment Days of treatment → More effective and potent treatments Control Irosustat Cholesterol-based inhibitor will require lower dosage Can reduce drug development timelines → Non-invasive approach \rightarrow faster access to treatments for patients Breast cancer cells (MCF7) Targeted delivery of drug molecules to tumours

References: **1**. https://www.bcrt.org.uk/information/, **2**. Hodgkinson, T. *et al.* (2021), *Science Advances*, 7(9), p. eabb7921. **3**. Palmieri, C.; Stein, R. C et al. (2017), Breast Cancer Res Treat, 165 (2), 343–353. Acknowledgments: We thank EPSRC and SFI for funding the lifETIME Centre for Doctoral Training (EP/S02347X/1). We also thank Dr. Zoe Davison, the Bone Cancer Research Trust, the France Group, CeMi and the Chemical Biology lab at the University of Glasgow.