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BACKGROUND

Despite medical advances that contributed to the decline of prostate's cancer (PCa) mortality, it still remains incurable in advanced stages.

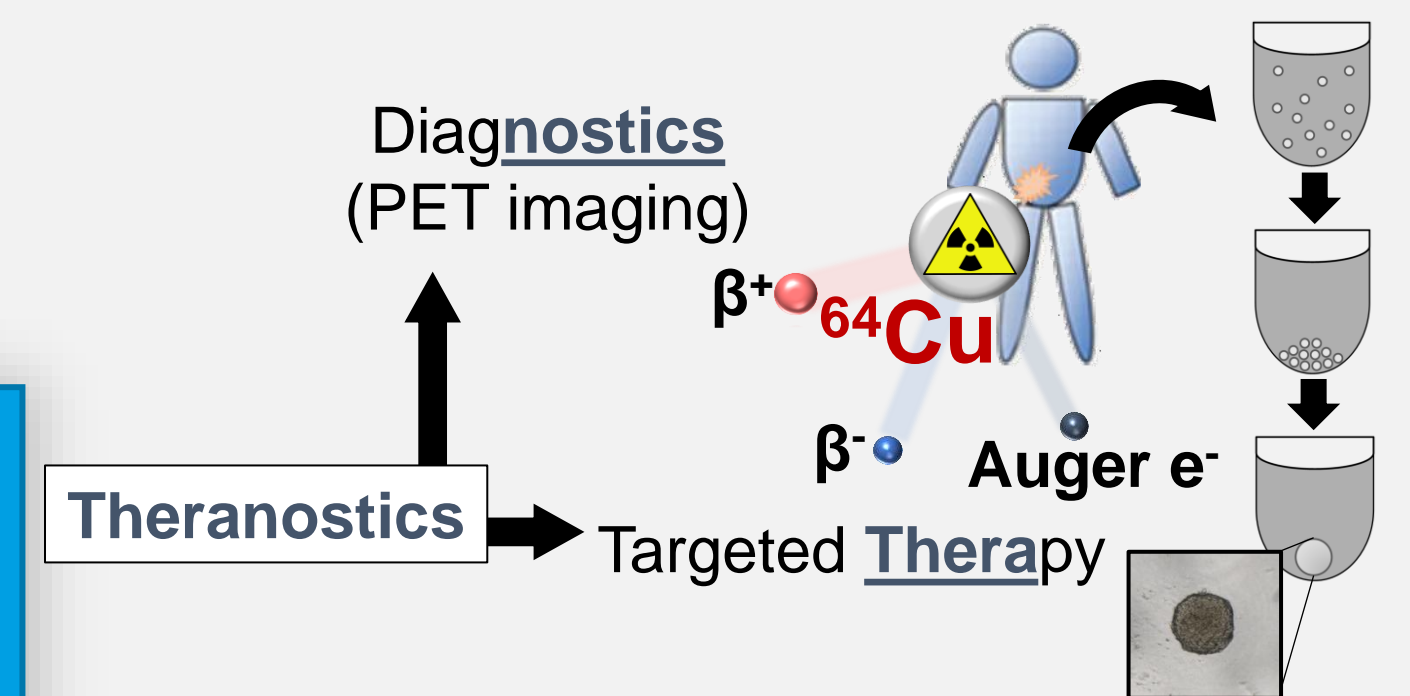
Important to develop new approaches to ensure early diagnosis and treatment of chemoresistant tumours.

Radiopharmaceuticals have the potential to be used in diagnosis, therapy or simultaneously for both purposes – theranostics.

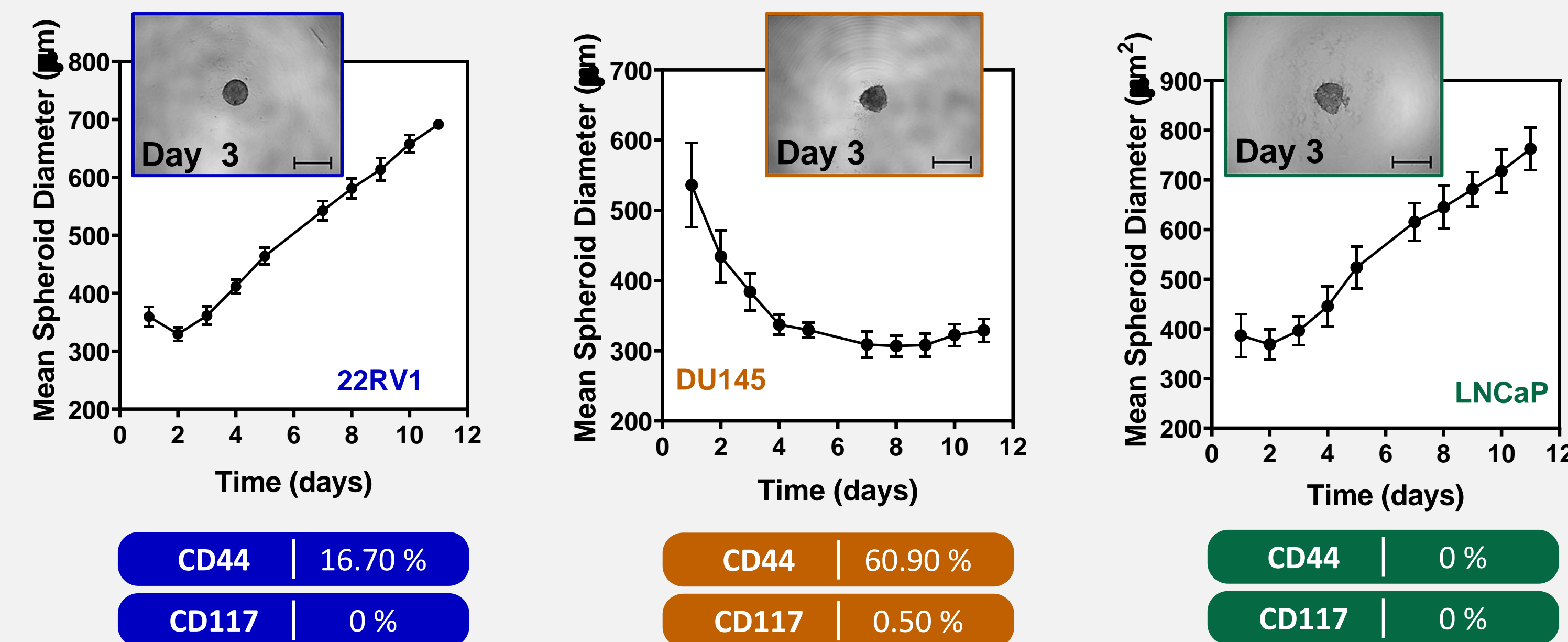
⁶⁴CuCl₂ has the potential to induce damage in monolayer cultured PCa cell lines, while bearing minimal side effects in non-tumoral cells. [1]

Need to use more sophisticated culture models, such as multicellular tumor spheroids, that better replicate the metabolic and proliferative gradients of tumors, with enriched populations of cancer stem cells (CSCs), involved in treatment failure and cancer relapse. [2]

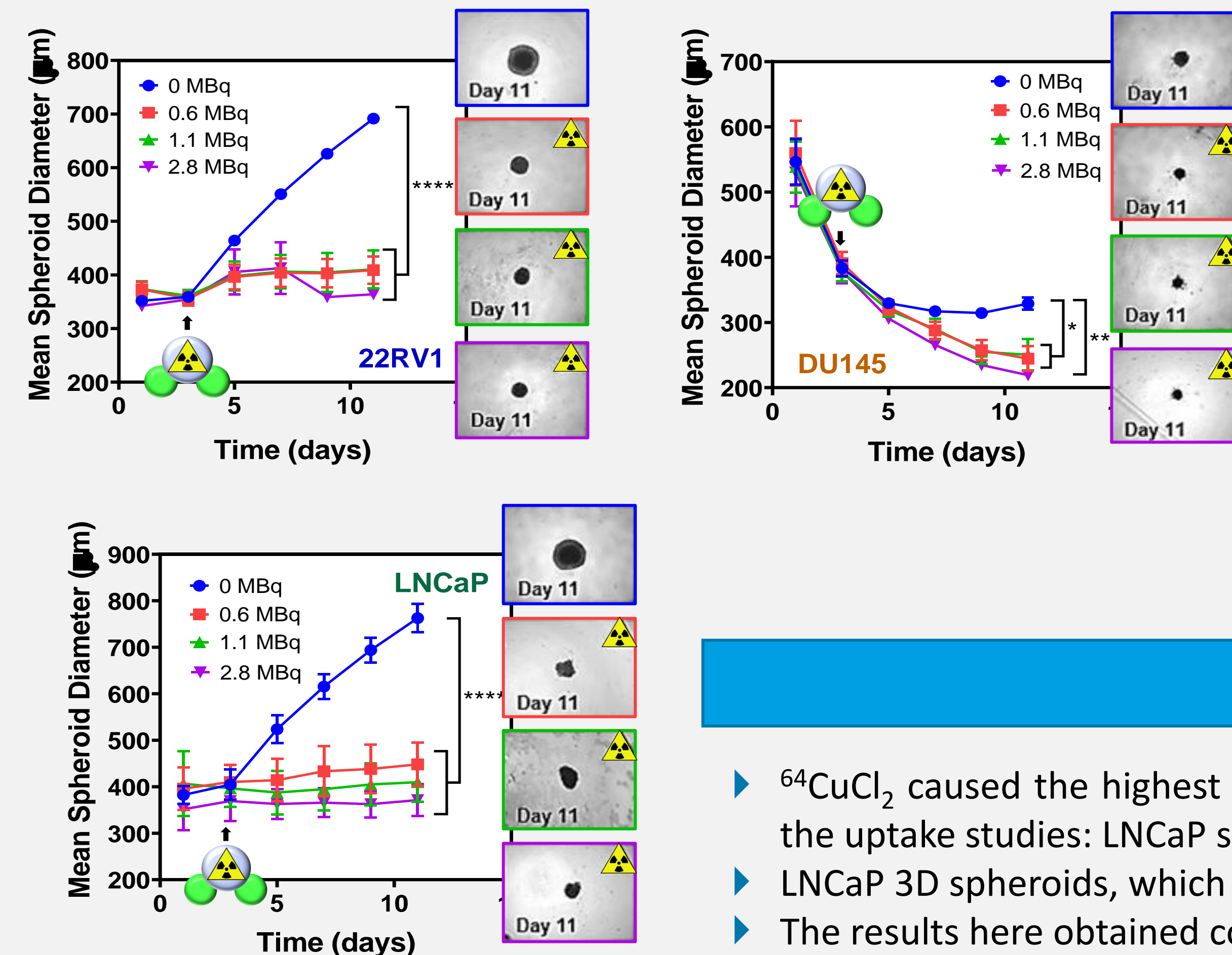
GOAL: To assess the theranostic potential of ⁶⁴CuCl₂ through the evaluation of the radiobiological effects of exposure of PCa spheroids from 3 cell lines (22RV1, DU145 and LNCaP) to this radionuclide



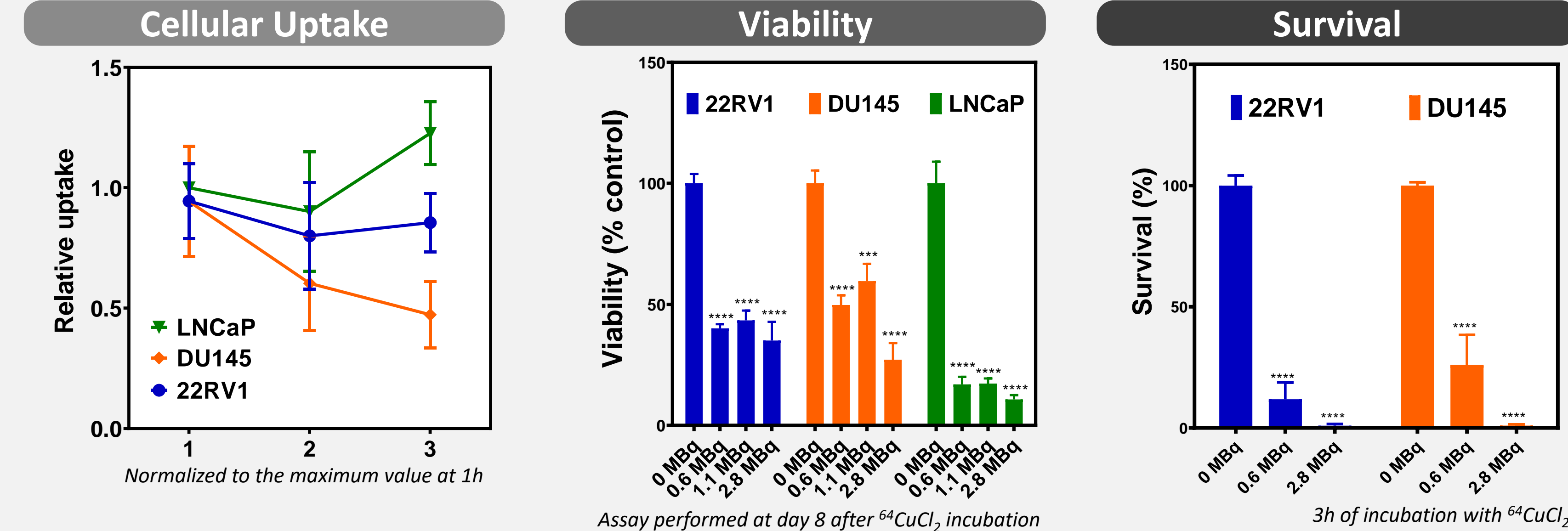
PCa spheroids were fully established at day 3, with a mean diameter from 350 to 400 μm, and had distinct populations of CSCs



⁶⁴CuCl₂ significantly inhibits the growth of PCa spheroids



⁶⁴CuCl₂ decreases PCa spheroids' viability and exerts an anti-proliferative activity, in agreement with the cellular uptake



CONCLUSIONS

- ⁶⁴CuCl₂ caused the highest cytotoxicity in LNCaP spheroids, followed by 22RV1 and DU145 spheroids. A similar trend was observed in the uptake studies: LNCaP spheroids had the highest uptake, followed by 22RV1 and DU145, as previously described for 2D cultures. [1]
- LNCaP 3D spheroids, which have the smallest population of CSCs, are more damaged by ⁶⁴CuCl₂ than spheroids from the other cell lines.
- The results here obtained confirm the **high potential of ⁶⁴CuCl₂ as a theranostic agent for PCa.** [3]

REFERENCES

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