Development of novel anti-cancer strategies utilizing the zebrafish xenograft model

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Stellingen behorend bij het proefschrift getiteld

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1. Macrophages are attracted to lactic acid, secreted by glycolytic melanoma cells, and promote the angiogenic process (Chapter 2).
2. Zebrafish embryos provide a fast vertebrate cancer model that can be used to test the administration regimen, toxicity and anti-cancer efficacy of PDT and PACT drugs against conjunctival melanoma (Chapter 3 and 4).
3. Injection of malignant cells into the retro-orbital site of eye of zebrafish embryos provides a new orthotopic model for studying conjunctival melanoma (Chapter 3 and 4).
4. Upon green light activation, the Ru-based PDT sensitizer TLD1433 inhibits growth of tumour cells *in vitro* and in zebrafish orthotopic and ectopic models for conjunctival melanoma (Chapter 3).
5. The ruthenium-based PACT compound ([2]$(PF_6)_2$) acquires anti-tumour efficacy in a zebrafish orthotopic model for conjunctival melanoma after retro-orbital administration and light irradiation (Chapter 4).
6. Light-triggered liposomal delivery of doxorubicin to engrafted breast cancer cells in zebrafish embryos enhances the targeting of cancer cells and improves the reduction of cancer cell burden (Chapter 5).
7. Zebrafish embryo is valid translational model for human diseases as these embryos share a functional homology with 84% of human disease genes (Kerstin Howe, Nature. 2013 Apr 25; 496(7446): 498–503).
8. Cell-specific and inducible drug delivery remains a major unsolved challenge for cancer nanomedicine (Jinjun Shi, Nat Rev Cancer. 2017,17: 20–37.
9. Increasing our understanding of tumour metabolism is crucial to advance therapy development (Adrian L. Harris, British Journal of Cancer. 2020, 122: 1–3).
10. The ability to predict and guide immunotherapeutic responsiveness againt tumours is an unmet clinical need (Mikhail Binnewies, Nat Medicine. 2018, 24: 541-550.
11. Successful treatment of cancer without side effects is a dream of any oncologist.
12. Fundamental research training of medical doctors improves their clinical performance.

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