Modelling metastatic melanoma in zebrafish

Groenewoud, A.

Chapter 8 List of publications

Original publications (*: shared first author)**:**

1. **Groenewoud A**, Forn-Cuní G, Engel F.B, Snaar-Jagalska B. E. XePhIR: The zebrafish Xenograft Phenotype Interactive Repository
2. **Groenewoud A**, Yin J, Snaar-Jagalska BE 'Ortho- and ectopic zebrafish xeno-engraftment of ocular melanoma to recapitulate primary tumor and experimental metastasis development. ***J Vis Exp.*** **2021**; (in press: https://www.jove.com/de/t/62356/ortho-ectopic-zebrafish-xeno-engraftment-ocular-melanoma-to)
3. Chen Q, Ramu V, Aydar Y, **Groenewoud A**, Zhou XQ, Jager MJ, Cole H, Cameron CG, McFarland SA, Bonnet S, Snaar-Jagalska BE. TLD1433 Photosensitizer Inhibits Conjunctival Melanoma Cells in Zebrafish Ectopic and Orthotopic Tumour Models. ***Cancers (Basel).*** **2020**; 12(3):587. doi: 10.3390/cancers12030587.
4. Chen L, De Menna M, **Groenewoud A**, Thalmann GN, Kruithof-de Julio M, Snaar-Jagalska BE. A NF-κB-Activin A signaling axis enhances prostate cancer metastasis. ***Oncogene*****. 2020**; 39(8):1634-1651. doi: 10.1038/s41388-019-1103-0.
5. Heitzer E*, **Groenewoud A***, Meditz K, Lohberger B, Liegl-Atzwanger B, Prokesch A, Kashofer K, Behrens D, Haybaeck J, Kolb-Lenz D, Koefeler H, Riedl S, Schaider H, Fischer C, Snaar-Jagalska BE, de'Jong D, Szuhai K, Zweytick D, Rinner B. Human melanoma brain metastases cell line MUG-Mel1, isolated clones and their detailed characterization. ***Sci Rep*****. 2019**; 9(1):4096. doi: 10.1038/s41598-019-40570-1.
6. Tulotta C, Groenewoud A, Snaar-Jagalska BE, Ottewell P. Animal Models of Breast Cancer Bone Metastasis. ***Methods Mol Biol*****. 2019**; 1914:309-330. doi: 10.1007/978-1-4939-8997-3_17.
7. van der Helm D, **Groenewoud A**, de Jonge-Muller ESM, Barnhoorn MC, Schoonderwoerd MJA, Coenraad MJ, Hawinkels LJAC, Snaar-Jagalska BE, van Hoek B, Verspaget HW. Mesenchymal stromal cells prevent progression of liver

fibrosis in a novel zebrafish embryo model. ***Sci Rep*. 2018**; 8(1):16005. doi: 10.1038/s41598-018-34351-5.

8. Paauwe M, Schoonderwoerd MJA, Helderman RFCP, Harryvan TJ, **Groenewoud A**, van Pelt GW, Bor R, Hemmer DM, Versteeg HH, Snaar-Jagalska BE, Theuer CP, Hardwick JCH, Sier CFM, Ten Dijke P, Hawinkels LJAC. Endoglin Expression on Cancer-Associated Fibroblasts Regulates Invasion and Stimulates Colorectal Cancer Metastasis. ***Clin Cancer Res*. 2018**; 24(24):6331-6344. doi: 10.1158/1078-0432.CCR-18-0329.

9. Cao J, Pontes KC, Heijkants RC, Brouwer NJ, **Groenewoud A**, Jordanova ES, Marinkovic M, van Duinen S, Teunisse AF, Verdijk RM, Snaar-Jagalska E, Jochemsen AG, Jager MJ. Overexpression of EZH2 in conjunctival melanoma offers a new therapeutic target. ***J Pathol*. 2018**; 245(4):433-444. doi: 10.1002/path.5094.

10. Pontes KCS, **Groenewoud A**, Cao J, Ataide LMS, Snaar-Jagalska E, Jager MJ. Evaluation of (fli:GFP) Casper Zebrafish Embryos as a Model for Human Conjunctival Melanoma. ***Invest Ophthalmol Vis Sci*. 2017**; 58(14):6065-6071. doi: 10.1167/iovs.17-22023.

11. Liverani C, La Manna F, **Groenewoud A**, Mercatali L, Van Der Pluijm G, Pieri F, Cavaliere D, De Vita A, Spadazzi C, Miserocchi G, Bongiovanni A, Recine F, Riva N, Amadori D, Tasciotti E, Snaar-Jagalska E, Ibrahim T. **CORRECTION**: Innovative approaches to establish and characterize primary cultures: an ex vivo 3D system and the zebrafish model. ***Biol Open*. 2017**; 6(2):309. doi: 10.1242/bio.023911.

12. Liverani C, La Manna F, **Groenewoud A**, Mercatali L, Van Der Pluijm G, Pieri F, Cavaliere D, De Vita A, Spadazzi C, Miserocchi G, Bongiovanni A, Recine F, Riva N, Amadori D, Tasciotti E, Snaar-Jagalska E, Ibrahim T. Innovative approaches to establish and characterize primary cultures: an ex vivo 3D system and the zebrafish model. ***Biol Open*. 2017**; 6(2):133-140. doi: 10.1242/bio.022483.

13. Mercatali L, La Manna F, **Groenewoud A**, Casadei R, Recine F, Miserocchi G, Pieri F, Liverani C, Bongiovanni A, Spadazzi C, de Vita A, van der Pluijm G, Giorgini A, Biagini R, Amadori D, Ibrahim T, Snaar-Jagalska E. Development of a Patient-Derived Xenograft (PDX) of Breast Cancer Bone Metastasis in a Zebrafish Model. ***Int J Mol Sci*. 2016**; 17(8):1375. doi: 10.3390/ijms17081375.

14. Tulotta C, He S, Chen L, **Groenewoud A**, van der Ent W, Meijer AH, Spaink HP, Snaar-Jagalska BE. Imaging of Human Cancer Cell Proliferation, Invasion, and Micrometastasis in a Zebrafish Xenogeneic Engraftment Model. ***Methods Mol Biol*. 2016**; 1451:155-69. doi: 10.1007/978-1-4939-3771-4_11.

15. Riaz M, Berns EM, Sieuwerts AM, Ruigrok-Ritstier K, de Weerd V, **Groenewoud A**, Uitterlinden AG, Look MP, Klijn JG, Sleijfer S, Foekens JA, Martens JW. Correlation of breast cancer susceptibility loci with patient characteristics, metastasis-free survival, and mRNA expression of the nearest genes. ***Breast Cancer Res Treat*. 2012** Jun;133(3):843-51. doi: 10.1007/s10549-011-1663-3.

Reviews and Editorials:

1. Chen L*, **Groenewoud A***, Tulotta C, Zoni E, Kruithof-de Julio M, van der Horst G, van der Pluijm G, Ewa Snaar-Jagalska B. A zebrafish xenograft model for studying human cancer stem cells in distant metastasis and therapy response. ***Methods Cell Biol*. 2017**; 138:471-496. doi: 10.1016/bs.mcb.2016.10.009.

2. van der Ent W, Veneman WJ, **Groenewoud A**, Chen L, Tulotta C, Hogendoorn PC, Spaink HP, Snaar-Jagalska BE. Automation of Technology for Cancer Research. ***Adv Exp Med Biol*. 2016**; 916:315-32. doi: 10.1007/978-3-319-30654-4_14.

3. Tulotta C, He S, van der Ent W, Chen L, **Groenewoud A**, Spaink HP, Snaar-Jagalska BE. Imaging Cancer Angiogenesis and Metastasis in a Zebrafish Embryo Model. ***Adv Exp Med Biol*. 2016**; 916:239-63. doi: 10.1007/978-3-319-30654-4_11.

Research monographs, chapters in collective volumes:

1. **Groenewoud A**, Mathijs Kint, B. Ewa Snaar-Jagalska , Anne-Marie Cleton-Jansen, PhD. Zebrafish models for studying bone tumors. ed. Heymann D. *Bone Cancer: Bone Sarcomas and Bone Metastases - From Bench to Bedside*. Academic Press Inc., San Diego, USA, **2021**. ISBN 978-0-12-821666-8, pp. (in press).

Submitted manuscripts:

1. Varela M, Flier A, Lamers G, van der Vaart M, **Groenewoud A**, Meijer AH. Gasdermin D pore formation in bacterial phagosomes 2 initiates macrophage pyroptosis.
2. **Arwin Groenewoud**, Jie Yin, Maria-Chiara Gelmi, Samar Alsafadi, Fariba Nemati, Didier Decaudin, Sergio Roman-Roman, Helen Kalirai, Sarah E. Coupland, Aart G. Jochemsen, Martine J. Jager, Ewa Snaar-Jagalska
   Patient-derived zebrafish xenograft models reveal ferroptosis as a fatal and druggable weakness in metastatic uveal melanoma

Chapter 9 Curriculum vitae

Arwin Groenewoud was born in Heerjansdam the Netherlands on April 2nd, 1988. In 2005 he completed Walburg college Zwijndrecht and started his studies as lower-level laboratory technician (MLO) at Zadkine, Rotterdam. As part of his MLO education, he performed an internship in the department of medical oncology, under the supervision of Anieta Sieuwerts, in the group of John Foekens on SNP profiling in breast cancer, finishing in 2009. Subsequently he continued with his BSc degree in biotechnology and medical research at Avans applied science university, Breda the Netherlands, where he performed two internships. The first in the department of molecular allergology of the Paul Ehrlich Institute, Langen, Germany under the supervision of Stefan Schülke in the group of Stephan Scheurer on TLR ligand-based allergy vaccines. His second internship was conducted in the department of experimental surgical oncology, in the Erasmus Medical Center in Rotterdam, the Netherlands. During this internship he worked on the development of cationic, temperature triggered release liposomes for the delivery of chemotherapeutics, under the supervision of Bilyana Dicheva in the group of Timo ten Hagen in the Erasmus Medical Center. He obtained his BSc with honors in 2012 and started a MSc program in molecular biology at Leiden University, where he performed and internship in the group of Ewa Snaar-Jagalska, working on modelling nascent breast cancer metastases in zebrafish, he finished his MSc in 2015. In the interim between his MSc and the start of his PhD he worked at Leiden University as a research and teaching assistant. He started his PhD in 2016, wherefrom the work outlined in this thesis was derived. In 2021 he moved to Germany to join the group of Prof Felix Engel, to continue his research on cancer using the zebrafish model.