

Chemically induced tumor model in C57BL/6 WT and LAIR-1 deficient mice

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Introduction

Skin cancer is one of the most common malignancies affecting humans worldwide, and its incidence is rapidly increasing. Mouse models of skin carcinogenesis remain one of the most commonly available and cost-effective animal models. The DMBA/TPA model is the most commonly used chemically induced model and has been illustrated to closely mimic human squamous cell carcinoma. Tumor formation is induced in this model by applying chemicals **DMBA** (7,12-dimethylbenz[a]anthracene) which causes mutations in the epidermal cells (and a continuous application leads to general growth of cells) and **TPA** (12-O-tetradecanoyl phorbol-13-acetate) which accelerates skin papilloma formation. One of the features of tumors is increased fibroblast proliferation and collagen deposition which was also observed in this model. LAIR-1 is an immune inhibitory receptor that recognizes collagen as its main ligand. In this project we want to make use of the DMBA/TPA skin carcinogenesis model, where changes in collagen expression has been reported to compare tumor development in WT and LAIR-1 deficient mice (LAIR-1^{-/-}).

Hypothesis: Since DMBA/TPA induced tumor progression is accompanied by increased collagen deposition, and collagen is the main ligand for the inhibitory receptor LAIR-1, we hypothesize that LAIR-1^{-/-} mice would develop less tumors or are able to clear them more efficiently.

Results



Figure 2 Mice with papilloma's after 20 weeks of DMBA/TPA treatment.

Conclusion

Both LAIR-1^{-/-} and WT mice developed papilloma's starting after 8 weeks of DMBA/TPA application. However, contrary to our hypothesis LAIR-1^{-/-} mice develop more papilloma's than WT mice. Further research is necessary to understand the mechanism behind increased papilloma formation in LAIR-1^{-/-} mice.

Methods

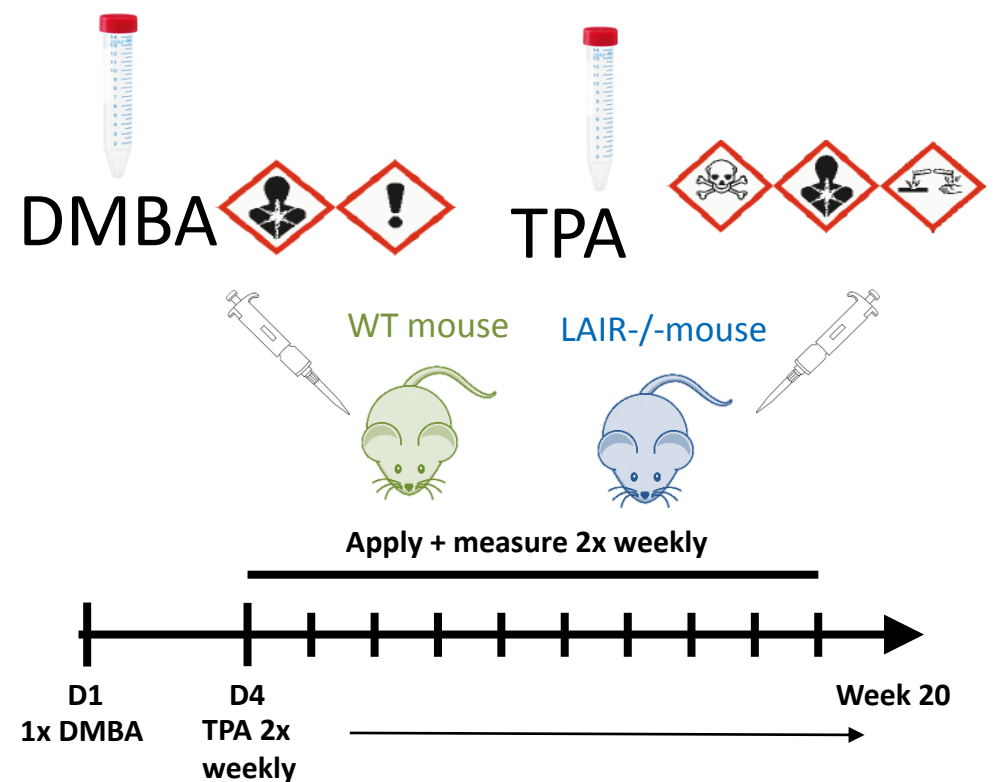


Figure 1 We used 10 female WT mice and 10 female LAIR-1^{-/-} mice (randomized per cage). DMBA (25 mg in 200 ml acetone; Sigma) was applied at day 1 and from day 4 TPA (200 ml of 10⁻⁴M solution in acetone; Sigma) was applied 2x weekly for 20 weeks.

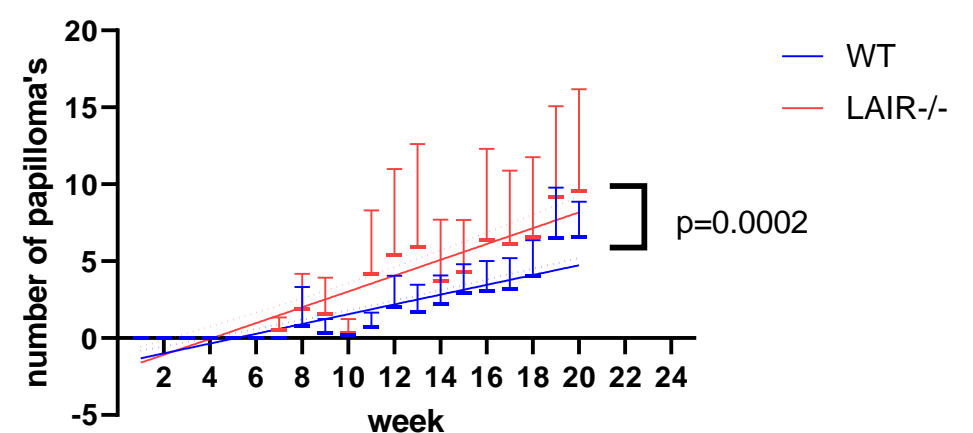


Figure 3 Number of papilloma's shown per week.

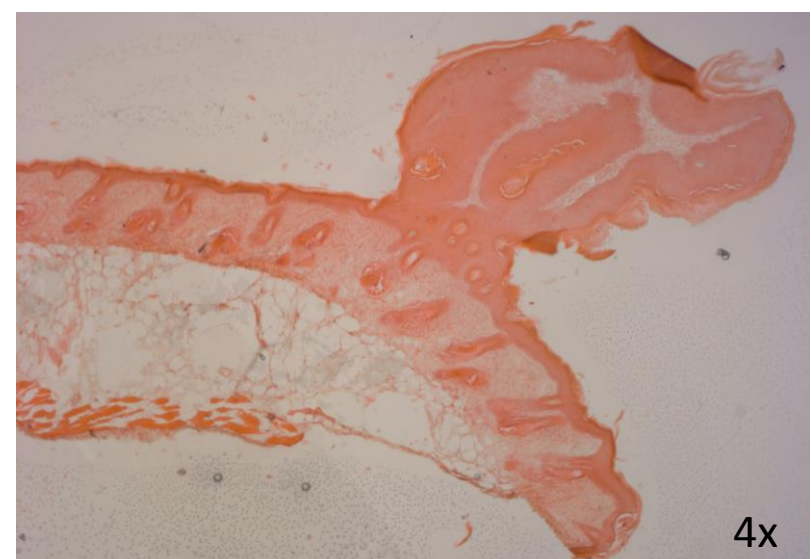


Figure 4 Representative image of H&E staining on frozen papilloma sections.