Short summary

Organotypic *in vitro* models of human cutaneous squamous cell carcinoma

Skin cancer is the most common type of cancer in fair-skinned populations. Cutaneous squamous cell carcinoma (SCC) comprises about 15% of all skin cancer diagnoses. Treatment associated with the high and rising prevalence of cutaneous SCC puts an increasingly high financial burden on society, marking a pressing need for advancements in skin cancer drug development. For screening of novel therapeutic compounds, representative models of human cutaneous SCC are required.

The aim of the research described in this thesis was to develop a representative *in vitro* model of human SCC for screening potential therapeutic compounds, without the unnecessary use of animals. To this end, we generated several three-dimensional *in vitro* SCC models in which the malignant epidermal cancer cells were either represented by intact primary human cutaneous or by established, spontaneously immortalized human cutaneous SCC cell lines. The dermal microenvironment in our models was seeded with either primary normal human dermal fibroblasts or primary fibroblasts associated with SCCs. In verifying human cutaneous SCC representation in these *in vitro models*, we focused on hyperproliferation, cytological and architectural atypia and invasion as three main features of primary SCC.

The *in vitro* skin cancer models presented in this thesis add to the spectrum of available *in vitro* models for therapeutic screening.