IDENTIFICATION OF NOVEL BREAST CARCINOMA AND MELANOMA AVID PEPTIDES FOR IMAGING

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ABSTRACT

During the last decade, peptides and their derivatives have been employed as effective cancer imaging agents. We aimed to identify new peptides probes specific for melanoma and breast carcinoma by phage display technology. Phage libraries were pre-cleared of peptides that bound normal vasculature and tissues in mice and peptides that bound nonmalignant human cells and then selected against human cancer cells.18 positive phage clones were biotinylated for a cell based ELISA or conjugated with near-infrared fluorescent dye Alexa Fluor 680 for in vivo optical imaging. In the cell based ELISA, two clones bound melanoma cells and one clone bound breast carcinoma cells exhibiting a 8-40 fold increase in signal strength compared to wild-type phage. In mice melanoma models injected with Alexa Fluor 680 conjugated phage, three clones showed at least a two-fold increase in tumor of fluorescence postinjection compared to the pre-injection levels. Injection of 6 of the selected phage clones resulted in upregulated fluorescence in breast carcinoma models. 5 peptides were synthesized and radiolabelled by In111. The cancer cells had reduced radioactivity absorption when competed by the non-radioactive In-DOTA-peptide complex. In conclusion, the modified phage display affinity selection procedure resulted in the identification of peptides that specifically targeted melanoma or breast carcinoma in vitro, two of which possessed affinity in vivo to melanoma/breast carcinoma in the respective mouse model.