THE USE OF FD-FILAMENTOUS BACTERIOPHAGE FOR THE *IN VIVO* IMAGING OF CANCER

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ABSTRACT

Improved diagnosis of cancer through targeted imaging of neoplasms is needed for early detection and treatment of cancer. We propose that the physical characteristics of filamentous bacteriophage (phage) are well suited for use in the targeted imaging of cancer. This study describes the development of two different phage-based cancer imaging agents. One is specific for prostate carcinoma, and the other specific for melanoma, with each utilizing different imaging modalities - optical imaging and radioimaging.

A human PC-3 prostate carcinoma was optically imaged using phage displaying a newly selected prostate homing peptide labeled with the near infrared fluorophore AF680, whereas, a mouse B16-F1 melanoma was radioimaged using single-photon-emission-computed-tomography through a two-step pretargeting procedure. This pretargeting strategy utilized bifunctional bacteriophage that were both biotin labeled and displayed α-melanoma stimulating hormone peptide analogs and included streptavidin-chelator complex radiolabeled with ^{111}In. The successful imaging of prostate carcinoma and melanoma with different strategies exhibits the versatility of phage and highlights their utility in the imaging of cancer.