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Affibody technology targeting cancer: Imaging and therapy applications

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Affibody molecules constitute a class of engineered affinity proteins with potential in biotechnological, diagnostic and maybe also biotherapy applications. Affibody molecules are small (6.5 kDa) single domain proteins that can be isolated for high affinity and specificity to given protein targets. Fifteen years after its discovery, the affibody technology is gaining use in many groups with an interest in small affinity proteins. The generation and use of affibody molecules binding with high affinity to the human epidermal growth factor receptors, EFGR, HER2 and HER3 and their use for medical imaging applications as well as efforts towards future tumor biotherapy applications will be addressed. High contrast PET and SPECT imaging in mouse xenografts as well as data on complete eradication of small HER2-expressing tumors in mice will be shown. The first human studies for affibody-mediated imaging of HER2-expressing metastatic lesions in recurrent breast cancer patients will be presented. A picomolar HER3-binding affibody molecule has been generated that shows antiproliferative capacity in cell assays, and therapy applications can thus be considered. The small affibody molecules are also well suited for creating bispecific tumor targeting reagents, and our efforts in this area will be described.

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Page 127