Ning Deng, J Cancer Sci Ther 2018, Volume 10
DOI: 10.4172/1948-5956-C8-144

29th Euro-Global Summit on

Cancer Therapy & Radiation Oncology

July 23-25, 2018 | Rome, Italy

A new disulfide-stabilized diabody against bFGF and the inhibition of cancer

Ning Deng
Jinan University, China

Angiogenesis plays a critical role in tumor growth. Fibroblast growth factor-2 (FGF-2) is one of the most important angiogenic factors. The over-expression of bFGF plays a crucial role to promote tumor growth, progression and metastasis. Neutralizing antibodies against FGF-2 may suppress the growth of tumor cells by blocking the FGF-2 signaling pathway. In our lab, we scanned human anti-bFGF antibody from the phage antibody library. The results showed that the human anti-bFGF antibody could significantly inhibit the tumor angiogenesis and inhibit the tumor growth and migration. Based on this antibody, a newly small molecular antibody of disulfide-stabilized diabody (ds-Diabody) against bFGF was constructed by site-directed mutation and overlap extension PCR (SOE-PCR) at the position of VH44 and VL100 in the scFv. The ds-Diabody was expressed in *Pichia pastoris* system. We found that the ds-Diabody against bFGF could maintain good antigen binding activity and stability *in vitro* and *in vivo*. The ds-Diabody against bFGF could efficiently suppress the proliferation, migration and invasion of human lung cancer (A549 cells) and breast cancer (MCF-7 cells), inhibit bFGF-induced activation of downstream signaling regulators, phospho-Akt and phospho- MAPK. In the nude mouse xenograft model, the ds-Diabody against bFGF could significantly inhibit tumor growth, tumor angiogenesis and lymphangiogenesis. The ds-Diabody against bFGF showed stability *in vivo* and could more effectively suppress the tumor growth through blockade of bFGF signaling pathway and inhibition of tumor angiogenesis, which may make it a potential therapeutic candidate antibody drug for human lung cancer therapy.

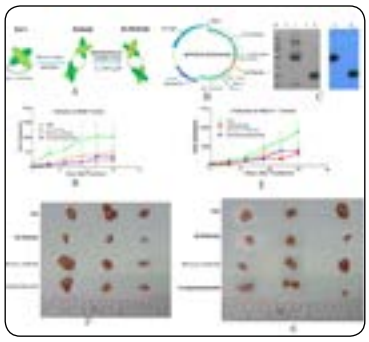

Figure 1: Construction and function of ds-Diabody against bFGF. A construction of ds-Diabody; B expression vector; C expression of ds-Diabody; D growth curve of lung cancer; F growth curve of breast cancer; F tumors of lung cancer; G tumors of breast cancer

Recent Publications:

1. Yaxiong Cai, Shuange Yao, Ning Deng, et al. (2017) Inhibition activity of a disulfide-stabilized diabody against basic fibroblast growth factor in lung cancer. Oncotarget 8(12): 20187–20197.

2. Yinghua Li, Zhengfang Lin, Ning Deng and Bing Zhu (2017) Delivery of VP1 siRNA to inhibit the EV71 virus using functionalized silver nanoparticles through ROS mediated signaling pathways. RSC Adv. 7:1453–1463.

3. Yaxiong Cai, Jinxia Zhang, Ning Deng (2016) Construction of a disulfide-stabilized diabody against fibroblast growth factor-2 and the inhibition activity in targeting breast cancer. Cancer Science 107(8):1141–1150.

4. Shoumei Bai, Patrick Ingram, Yu-Chih Chen, Ning Deng and Ronald J Buckanovich (2016) EGFL6 regulates the asymmetric division, maintenance, and metastasis of ALDH+ovarian cancer cells. Cancer Res. 76(21):6396–6409.

5. Chuping Zheng, Jinsheng Wang, Ning Deng and Jie Liu (2014) Functional selenium nanoparticles enhanced stem cell osteoblastic differentiation through BMP signaling pathways. AdvancedFunctional Materials 24(43):6872–6883.

Biography

Ning Deng has his expertise in antibody drug and tumor polypeptide vaccine around tumor angiogenesis inhibition. He has established antibody design and construction system, included the phage antibody library, affinity maturation and improvement based on antibody structural simulation, evaluation system for tumor peptide vaccine. He also researched on the mechanism of tumor angiogenesis in ovarian cancer and stem cell evaluation.

tdengn@jnu.edu.cn

Notes: