An EphA2 monobody as a probe for colorectal cancer

Akhil Venu[1], Ying Zhang[1], Jihyoung Seong[2], Yeongjin Hong[1], Wan-Sik Lee[2], and Jung-Joon Min[1]

[1]Chonnam National University Hwasun Hospital
[2]Chonnam National University Hospital

April 21, 2023

Abstract

Bakground Colorectal cancer (CRC) is the third most common cancer worldwide and the second most common cause of cancer-related death. Various molecular markers are used for early CRC diagnosis. Of these, human ephrin receptor family type-A 2 (hEphA2) oncoprotein is overexpressed significantly at the early, but not late, stages of CRC. Previously, we reported an E1 monobody that is specific for hEphA2-expressing cancer cells both in vitro and in vivo. Aim We aimed to use E1 monobody as a detection probe for hEPhA2 expressing colorectal cancer. In addition, we investigated the efficacy of E1 monobody to target on human colorectal cancer tissue. Method Here, we confirmed the expression of hEPhA2 on the surface of colorectal cancer cells by western blotting and flow cytometry. We evaluated the targeting efficacy of E1 monobody on colorectal cancer cells by flow cytometry and further confirmed with immunofluorescence staining. E1 conjugated to the Rluc8 reporter protein were used as imaging agent for in vivo imaging. Additionally, EGFP conjugated E1 monobody were used to check the targeting ability of E1 monobody on human colorectal cancer tissue. Result E1 bound efficiently to nine hEphA2-expressing CRC cell lines and E1 conjugated to the Rluc8 reporter protein targeted tumor tissues in mice transplanted with HCT115 CRC tumor cells. Finally, E1-EGFP stained tumor tissues from human CRC patients, showing a pattern similar to that of an anti-hEphA2 antibody. Conclusion These results suggest that the E1 monobody has utility as a probe to detect CRC.

Hosted file

`EphA2 monobody as a probe for colorectal cancer_Final V (2).docx` available at https://authorea.com/users/609859/articles/639045-an-epha2-monobody-as-a-probe-for-colorectal-cancer