

## Targeting EGFR for fluorescence optical imaging of cancer

**Haibiao Gong**

LI-COR Biosciences, USA

Dysregulation of epidermal growth factor receptor (EGFR) is associated with many types of cancers. It is of great interest to noninvasively image the EGFR expression *in vivo*. Among different modalities, fluorescence optical imaging has the advantage of low cost, easiness of handling and simplicity for multiplexing. Fluorescence in the near-infrared (NIR) spectral region is especially desirable due to its reduced background and high penetration capability. Various EGFR-targeting molecules have been studied for molecular imaging. These include antibodies, antibody fragments, natural ligand EGF, nanobody and affibody. A couple of examples will be discussed, with the focus on IRDye® 800CW labeled EGF (EGF800) and EGFR-specific affibody (Eaff800).

Both EGF800 and Eaff800 were characterized for binding/uptake using EGFR-overexpressing cells. When used for *in vivo* tumor imaging, the signal intensities of EGF800 had a good correlation with tumor sizes. In an orthotopic prostate tumor model, the tumor growth was successfully tracked by EGF800. *In vivo* imaging study of Eaff800 was conducted in A431 xenograft tumors. The accumulation of EGF800 in the tumor could be identified 1 hr post-injection, and became most prominent after 1 d. The specificity of Eaff800 was confirmed by its high level of binding/uptake by A431 cells and low binding/uptake by HER2-overexpressing cells. In combination with an HER2-specific probe Haff682, Eaff800 could be used to distinguish between A431 (EGFR-overexpressing) and SKOV3 (HER2-overexpressing) tumors. Interestingly, the organ distribution pattern and clearance rate of Eaff800 were different from those of Haff682. While Haff682 accumulated predominantly in the kidney, more Eaff800 was found in the liver.

### Biography

Haibiao (Herbert) Gong earned a Ph.D. degree in molecular biology at National University of Singapore. He did his postdoctoral research at University of Pittsburgh, School of Pharmacy, and joined LI-COR Biosciences as a research scientist in 2007. His research focus at LI-COR is near-infrared fluorescence imaging. He has published more than 30 papers in reputed journals.