ANALYSIS OF CIRCULATING TUMOR EGFR-DNA IN PLASMA DURING EGFR-TKI THERAPY OF EGFR MUTATION-POSITIVE LUNG CANCER PATIENTS

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EGFR-TKI therapy for EGFR-mutation positive non-small lung cancer patient is already established for years. However, lung cancers always develop resistance during EGFR-TKI treatment, and half of them are due to T790M second mutation.

Re-treatment of EGFR-TKI when re-challenge or under flare-phenomenon with some response may imply some EGFR-TKI sensitive cancer cells remained after first EGFR-TKI treatment. Previously, our group showed the quantitative analysis of EGFR-TKI-resistance, by counting small amount of wild-type, active-mutation, and T790M-mutation EGFR-DNA fragments derived from plasma or other samples, utilizing BEAMing method or next generation sequencer. With these methods, we quantitatively measure circulating cancer EGFR-DNA, and lesion cancer EGFR-DNA in some cases, during EGFR-TKI therapy. We show the patients data obtained from EGFR-TKI treatments during June 2010 to March 2013. During EGFR-TKI treatment, circulating tumor DNA showed rapid decrease at first and gradual increase. The rate of T790M/active-mutation, which assumed resistant rate, showed gradual increase during EGFR-TKI treatments in some cases. After progression of EGFR-TKI therapy, our methods are expected to be convenient and less painful way of measuring EGFR-resistance.