Simultaneous Tissue and Liquid Next-generation Sequencing after First-line EGFR Tyrosine Kinase Inhibitors Resistance in Advanced Non-small Cell Lung Cancer

Yen Ting Lin1,2,3,4,5, Chao-Chi Ho1,6, Wei-Hsun Hsu1,6, Wei-Yu Liao2,7, Ching Yao Yang2,7, Kien Thiam Tan4, Wen Hsiao6, Jin Yuan Shih1,2

1Graduate Institute of Clinical Medicine, National Taiwan University College of Medicine, Taipei, Taiwan; 2Department of Internal Medicine, National Taiwan University Hospital and College of Medicine, National Taiwan University, Taipei, Taiwan; 3Department of Medicine, National Taiwan University Cancer Center, Taipei, Taiwan; 4Department of Medical research, National Taiwan University Hospital; 5ACT Genomics, Taiwan; 6Merck Sharp & Dohme, Novartis, Pfizer, Roche, Takeda and TTY Biopharm; and travel expense from AstraZeneca, Boehringer Ingelheim, Bristol-Myers Squibb, Chugai Pharmaceutical, Eli Lilly, Janssen, Merck Sharp & Dohme, Novartis, Pfizer, Roche, Takeda and TTY Biopharm; and travel expense from Pfizer.

Disclosure
This study is sponsored by ACTGenomics.

*First author’s email address: ytinglin@ntu.edu.tw

Abstract
We prospectively enrolled patients with resistance with first-line EGFR TKI. Paired tissue rebiopsy NGS and liquid biopsy NGS were performed simultaneously.

Method
Advanced NSCLC with activating EGFR mutations were enrolled. Tissue rebiopsy NGS (paired) was recommended after resistance to first or second-generation EGFR tyrosine kinase inhibitors (TKIs). We performed EGFR TKI progression detection more T790M mutation than tissue NGS or liquid NGS only.

Result
86 patients were enrolled, but 26 of them did not have adequate tissue for NGS. Among the 26 patients, 5 had T790M from cfDNA. Total 60 patients had pairs of tissue and cfDNA NGS were further analyzed.

Conclusion
• Simultaneous tissue rebiopsy NGS and liquid NGS at first-line first or second generation EGFR TKI progression detect more T790M mutation than tissue NGS or liquid NGS only.
• At first-line first or second generation EGFR TKI progression, patients with “no variant detected” in cfDNA NGS may have longer second-line osimertinib PFS and longer OS after cfDNA checkup.
• EGFR, HER2 and MET amplification might contribute to the vast majority of resistance in T790M negative patients.
• NGS at EGFR TKI progression provides more information for sequential anticancer therapy.

Reference

*First author’s email address: ytinglin@ntu.edu.tw

Presented at the ELCC 2022, 30 March – 02 April 2022