

**Supplementary Table S8.** Repetitive tests with discordant results

Case <sup>a</sup>	Location	Site	Procedure	Material	Diagnosis	Test result	TKI Tx	Best response (TTD, mo)	Note
R1-1	Primary	Lung	PCNB	FFPE block	Adenocarcinoma	not identified			
R1-2	Primary	Lung	Lobectomy	FFPE block	Adenocarcinoma, acinar predominant	Exon19del	Gefitinib	SD (NR, 30+) <sup>b</sup>	
R2-1	Primary	Lung	Lobectomy	FFPE block	Adenocarcinoma, acinar predominant	G719X			
R2-2	Metastatic	Pleura	VATS Bx	FFPE block	Metastatic adenocarcinoma	not identified	Afatinib	PD (3)	Mutation not detected in an earlier biopsy
R3-1	Primary	Lung	PCNB	FFPE block	Adenocarcinoma with mucinous differentiation	not identified			
R3-2	Primary	Lung	PCNB	FFPE block	Adenocarcinoma, mucinous type	Exon19del	Erlotinib	SD (ND, 2)	Mutation not detected by NGS
R4-1	Primary	Lung (RUL)	Lobectomy	FFPE block	Adenocarcinoma, acinar predominant	L858R			
R4-2	Metastatic	Lung (LUL)	Wedge resection	FFPE block	Metastatic adenocarcinoma with solid and signet ring cell feature	not identified	Not done		ALK IHC+ (overexpression) observed in both specimens
R5-1	Metastatic	Lymph node	PCNB	FFPE block	Metastatic adenocarcinoma	Exon19del			
R5-2	Metastatic	Spine	Tumorectomy	FFPE block (decalcified)	Metastatic adenocarcinoma	not identified	Gefitinib	PR (6)	
R6-1	Metastatic	Lymph node	EBUS-TBNA Bx	FFPE block	Metastatic adenocarcinoma	Exon20ins L858R			
R6-2	Metastatic	Pleura	Pleurectomy	FFPE block	Metastatic adenocarcinoma	L858R	Gefitinib	PR (20)	L858R (only) detected in plasma test
R7-1	Metastatic	Pleura	VATS Bx	FFPE block	Metastatic adenocarcinoma	G719X S768I			
R7-2	Metastatic	Liver	PCNB	FFPE block	Metastatic adenocarcinoma	G719X	Afatinib	SD (7)	

TKI, tyrosine kinase inhibitor; Tx, therapy; TTD, time to treatment discontinuation; PCNB, percutaneous needle biopsy; FFPE, formalin-fixed paraffin-embedded; SD, stable disease; NR, not reached; VATS, video-assisted thoracoscopic surgery; Bx, biopsy; PD, progressive disease; ND, not detected; ALK, anaplastic lymphoma kinase; IHC, immunohistochemistry; PR, partial response; EBUS-TBNA, endobronchial ultrasound-transbronchial needle aspiration.

<sup>a</sup>Sub numbers in chronological order; <sup>b</sup>Gefitinib was used for diffuse pleural thickening with mild hypermetabolism which was not definite for metastasis.