


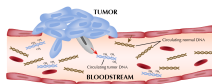


# Liquid Biopsy IRIS

Prof. Dr. Pauwels  
 Prof. Dr. Christian Roth  
 Dr. Karen Zwaenepoel – Dr. Vanessa Deschoolmeester  
 Laure Sorber

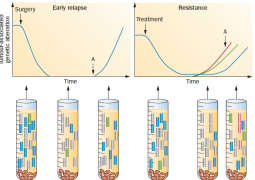




## Liquid Biopsy: ctDNA



### Uitdagingen ctDNA

- Lage hoeveelheid ctDNA  
 → ctDNA = 50% – 1/0,01% cfDNA
- Accurate kwantificatie mutante fragmenten



## Liquid Biopsy: ctDNA

### 1. Lage hoeveelheid ctDNA

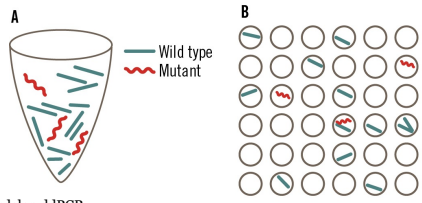
| Technique                         | Sensitivity    | Optimal Application                  |
|-----------------------------------|----------------|--------------------------------------|
| Sanger sequencing                 | > 10%          | Tumor tissue                         |
| Pyrosequencing                    | 10%            | Tumor tissue                         |
| Next-generation sequencing        | 2%             | Tumor tissue                         |
| Quantitative PCR                  | 1%             | Tumor tissue                         |
| ARMS                              | 0.10%          | Tumor tissue                         |
| BEAMing, PAP, Digital PCR, AM-Seq | 0.01% or lower | ctDNA, rare variants in tumor tissue |

### 2. Accurate kwantificatie

Digital droplet PCR → absolute kwantificatie  
 → # kopieën / staal  
 → Opvolging

## Liquid Biopsy: ctDNA

### Digital Droplet PCR (ddPCR)

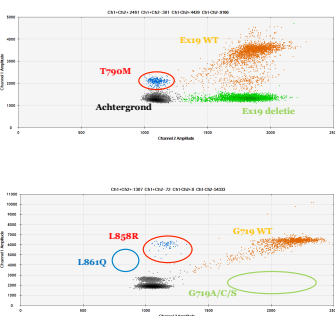


#### Voordelen ddPCR

- Hoge sensitiviteit
- Mogelijkheid tot multiplexen
- Absolute kwantificatie

- Detectie: genamplificatie, deletie, translocaties & genmutaties

## EGFR multiplex assays



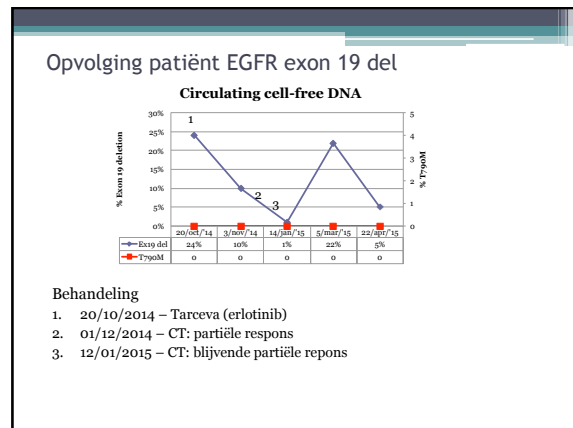
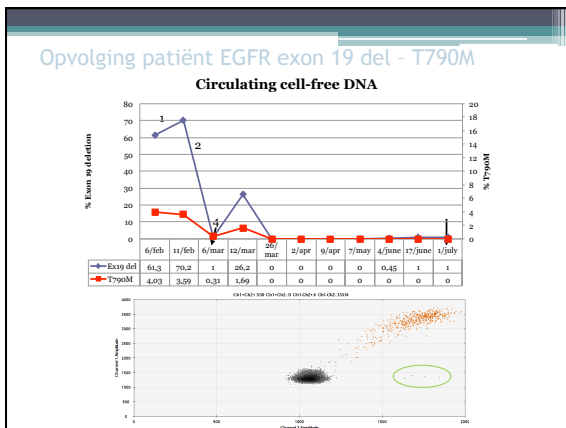
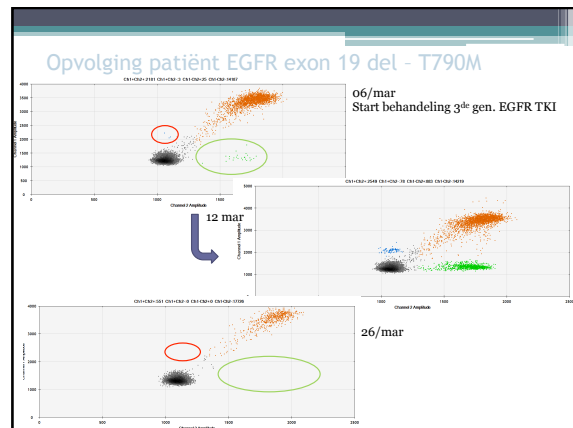
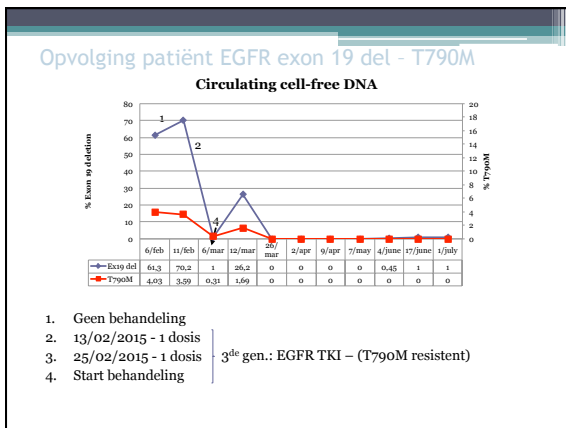
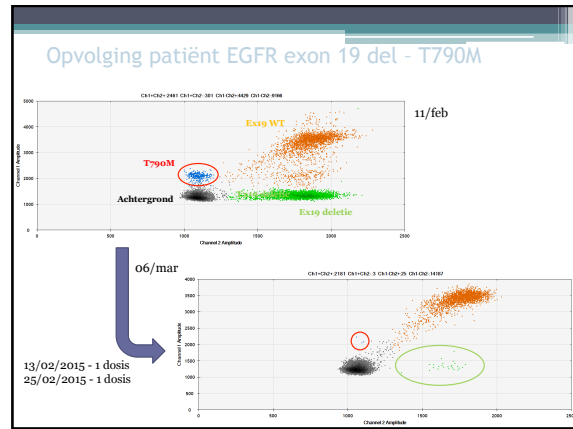
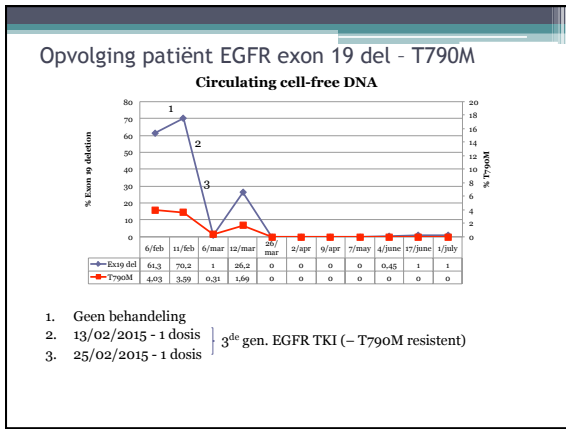
**MP1**  
 - Exon 19 deletie  
 - T790M

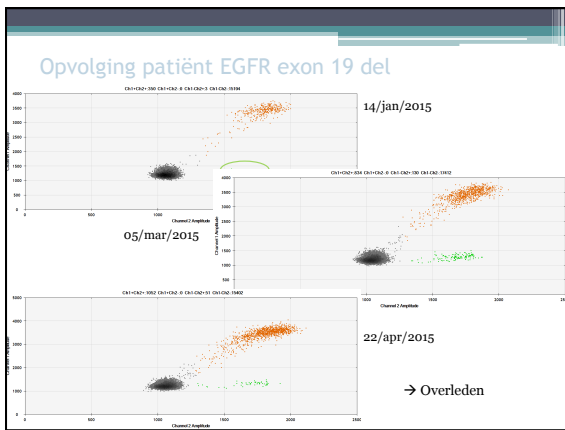
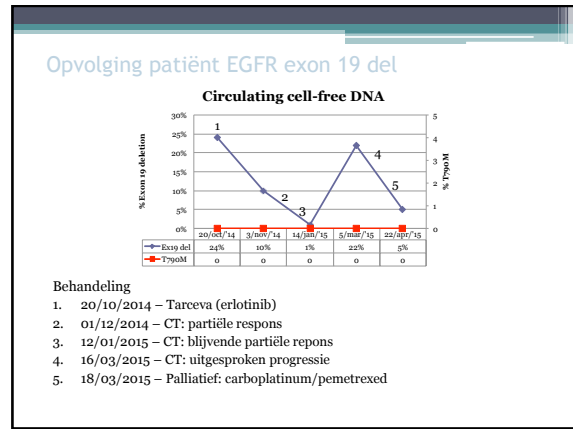
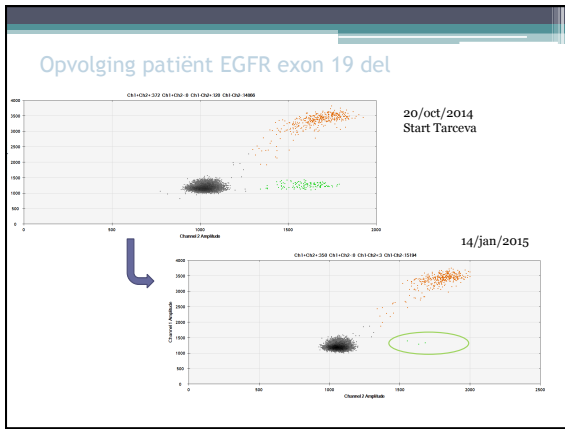
**cfDNA**  
 • Ex19 del: 70% - T790M: 3,59%

**MP2**  
 - L858R  
 - G719A/C/S  
 - L861Q

**cfDNA**  
 • L858R: 5,4%

## Preliminare resultaten





### Liquid Biopsy: ctDNA

#### Toepassingen Liquid Biopsy

- Identificatie van genetische markers voor specifieke therapie
- Evaluatie van “early” response op behandeling
- Opvolgen van tumordynamiek
- Beoordelen evolutie van resistentie in real-time
- Biopsie wanneer weefsel biopsie niet mogelijk/succesvol is
- ...

## IRIS studie

Universiteit Antwerpen

TOGA Thoracale Oncologie Groep Antwerpen

UZA