**Suppl 1.** Histologic and molecular characteristics of the tumors

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **HER2** | | | ***ERBB2*** | | **HR status** | | **Additional gene mutations** | | | |
| **IHC (4B5)** | **FISH** | **Status** | **CNA (FC)** | **Mutation** | **ER IHC** | **PgR IHC** | ***ESR1*** | ***PIK3CA*** | ***AKT1*** | ***PTEN*** |
| #1 | 0 | nega | nega | 0.57 |  | nega | nega |  |  |  |  |
| #2 | 0 | nega | nega | 0.71 |  | nega | nega |  |  |  |  |
| #3 | 0 | nega | nega | 1.00 |  | nega | nega |  |  |  |  |
| #4 | 0 | nega | nega | 1.00 |  | posi | posi |  |  |  |  |
| #5 | 0 | nega | nega | 1.00 |  | nega | nega |  |  |  | p.Y138C, p.Y311C |
| #6 | 0 | nega | nega | 1.00 |  | posi | posi |  |  |  | p.C218Wfs\*25 |
| #7 | 0 | nega | nega | 1.00 |  | posi | posi | p.F461V |  |  | p.T319\* |
| #8 | 0 | nega | nega | 1.00 |  | posi | posi | p.D538G |  | p.L52R |  |
| #9 | 0 | N/A | nega | 1.00 | p.R143Q | nega | nega |  |  |  |  |
| #10 | 0 | N/A | nega | 1.00 | p.R143Q | nega | nega |  |  |  |  |
| #11 | 0 | N/A | nega | 1.00 | p.R143Q | nega | nega |  |  |  |  |
| #12 | 0 | N/A | nega | 1.00 | p.D1144H | nega | nega |  |  |  |  |
| #13 | 0 | N/A | nega | 1.00 | p.R143Q | nega | nega |  |  |  |  |
| #14 | 1 | nega | low | 1.00 |  | posi | nega |  |  |  |  |
| #15 | 1 | nega | low | 1.00 | p.D769Y | posi | posi |  | p.E542Q |  |  |
| #16 | 1 | nega | low | 1.00 |  | nega | nega |  |  |  |  |
| #17 | 1 | nega | low | 1.00 |  | posi | posi |  | p.H1047L |  |  |
| #18 | 1 | nega | low | 1.00 |  | posi | posi | p.G145S | p.E542K |  |  |
| #19 | 1 | nega | low | 1.00 |  | posi | posi |  | p.E545K |  |  |
| #20 | 1 | nega | low | 1.00 |  | posi | posi |  | p.H1047R, V344M |  |  |
| #21 | 1 | nega | low | 1.00 |  | posi | posi |  |  |  |  |
| #22 | 1 | N/A | low | 1.00 |  | nega | nega |  |  |  |  |
| #23 | 1 | N/A | low | 1.00 |  | nega | nega |  |  |  | p.K128E |
| #24 | 2 | nega | low | 1.00 |  | nega | nega |  |  |  |  |
| #25 | 2 | nega | low | 1.20 |  | posi | posi |  |  |  |  |
| #26 | 1 | nega | low | 1.25 |  | posi | posi |  |  |  |  |
| #27 | 0 | N/A | nega | 1.32 |  | nega | nega |  |  |  |  |
| #28 | 0 | N/A | nega | 1.33 |  | nega | nega |  | p.E542K |  |  |
| #29 | 1 | N/A | low | 1.44 |  | nega | nega |  |  |  |  |
| #30 | 1 | nega | low | 1.45 |  | posi | posi |  |  |  |  |
| #31 | 1 | N/A | low | 1.67 |  | nega | nega |  |  |  |  |
| #32 | 1 | nega | low | 1.70 |  | posi | nega |  |  |  |  |
| #33 | 3 | posi | posi | 1.73 |  | posi | nega |  |  |  |  |
| #34 | 2 | posi | posi | 1.79 |  | nega | nega |  |  |  |  |
| #35 | 2 | posi | posi | 1.81 | p.R143Q | posi | posi |  |  |  |  |
| #36 | 3 | posi | posi | 2.36 |  | posi | posi |  |  |  |  |
| #37 | 3 | posi | posi | 4.09 |  | posi | posi |  |  |  |  |
| #38 | 3 | posi | posi | 4.82 |  | nega | nega |  |  |  |  |
| #39 | 3 | posi | posi | 5.57 |  | nega | nega |  |  |  | p.A103V |
| #40 | 3 | posi | posi | 8.68 |  | nega | nega |  |  |  |  |
| #41 | 3 | posi | posi | 14.03 |  | posi | posi |  |  |  |  |

HER2, human epidermal growth factor receptor 2; ERBB2, erb-b2 receptor tyrosine kinase 2; HR, hormone receptor; IHC, immunohistochemistry; FISH, fluorescence in situ hybridization; CNA, copy number alteration; ER, estrogen receptor; PgR, progesterone receptor; posi, positive; nega, negative; AMP, amplification; DEL, deletion; AKT1, serine/threonine kinase 1; ESR1, estrogen receptor 1; PIK3CA, phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha; PTEN, phosphatase and tensin homolog; VUS, variant of unknown significance.