**Supplementary Table 1** Standardized IHC staining procedures of RCs

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | Monoclonal Primary Antibody (Clone) | Incubation | Immunostainer | Antigen Retrieval | 2nd antibody | Incubation | Solution of chromoge | Incubation |
| ER | Ventana  | SP1 | RTU | 37℃ x 24min | BenchMark Ultra | CC1（pH8.2） x 36min | Ventana Multimer | 37℃ x 8min | DAB | 37℃ x 8min |
| DAKO | EP1 | RTU | 37℃ x 36min | DAKO Omnis | Target Retrieval Solution (pH6.1) x 64min | DAKO Envision+ Dual link system-HRP | 37℃ x 20min | DAB | 37℃ x 10min |
| Leica | 6F11 | RTU | 37℃ x 15min | Leica Bond III | ER2 x 25min | Leica Polymer | 37℃ x 8min | DAB | 37℃ x 10min |
| PR | Ventana  | 1E2 | RTU | RT x 24min | BenchMark Ultra | CC1（pH8.2） x 41min | Ventana Multimer | 37℃ x 8min | DAB | 37℃ x 8min |
| DAKO | PgR636 | RTU | RT x 20min | DAKO Omnis | Target Retrieval Solution (pH6.1) x 70min | DAKO Envision+ Dual link system-HRP | 37℃ x 20min | DAB | 37℃ x 10min |
| Leica | 16 | RTU | 37℃ x 15min | Leica Bond III | ER2 x 20min | Leica Polymer | 37℃ x 8min | DAB | 37℃ x 10min |
| Ki-67 | Ventana  | 30-9 | RTU | 37℃ x 16min | BenchMark Ultra | CC1（pH8.2） x 36min | Ventana Multimer | 37℃ x 8min | DAB | 37℃ x 8min |
| Maxim | MIB-1 | RTU | 37℃ x 20min | BenchMark Ultra | Target Retrieval Solution (pH6.1) x 36min | Ventana Multimer | 37℃ x 8min | DAB | 37℃ x 8min |
| Leica | K2 | RTU | 37℃ x 15min | Leica Bond III | ER2 x 10min | Leica Polymer | 37℃ x 8min | DAB | 37℃ x 8min |

RTU: Ready to use; RT: Room temperature.

**Supplementary-Fig 1** Observed agreement by different antibodies among 3 RCs and the reference value. The y-axis represents the percentage of positively stained tumour cells. RCs: Revising centres

