**Table S1. Summary of clinical characteristics of patients with breast cancer in IHC study.**

|  |  |
| --- | --- |
| **Characteristics** | **Number of Patients** |
| **Training cohort** | **Validation cohort** | **Independent cohrot** |
| **Age (year)** |  |  |  |
| ＜50≥50 | 7991 | 5674 | 4357 |
| **T** |  |  |  |
| T≥3cm | 103 | 77 | 45 |
| T<3cm | 67 | 53 | 55 |
| **Lymph nodes involvement** |  |  |  |
| + | 90 | 80 | 45 |
| - | 80 | 50 | 55 |
| **ER statue** |  |  |  |
| + | 76 | 104 | 65 |
| - | 94 | 26 | 35 |
| **PR statue** |  |  |  |
| **+** | 71 | 104 | 74 |
| - | 99 | 26 | 26 |
| **HER2** **overexpression** |  |  |  |
| + | 39 | 33 | 31 |
| **-** | 131 | 97 | 69 |
| **Ki67 index** |  |  |  |
| >30% | 90 | 55 | 63 |
| ≤30% | 80 | 75 | 37 |
| **Pathological grade** |  |  |  |
| I-II | 107 | 77 | 62 |
| III | 63 | 53 | 38 |
| **Clinical stage** |  |  |  |
| 1-2 | 70 | 81 | 69 |
| 3 | 100 | 49 | 31 |