

## Supplementary material – Table S2

Table S2. Demographic and clinicopathological information cancer associated, from the patients included in the study stratified by (A) body mass index (BMI), molecular subtype (MS), and (B) BMI and molecular subtype (mBMI).

(A)

|  | Normal weight<br>(18.5 – 24.9<br>Kg/m <sup>2</sup> ) | Obese<br>(> 30.0 Kg/m <sup>2</sup> ) | Total         | p-value | Luminal A    | Luminal B    | Triple<br>Negative | HER2+         | Total         | p-value           |
|--|--|--------------------------------------|---------------|---------|--------------|--------------|--------------------|---------------|---------------|-------------------|
| n (%)                                  | 32 (51.6%)   | 30 (48.4%)                           | 62 (100.0%)   |         | 16 (25.8%)   | 16 (25.8%)   | 16 (25.8%)         | 14 (22.6%)    | 62 (100%)     |                   |
| <b>Age at diagnosis</b><br>(Mean ± SD) | 56.88 ± 11.15  | 58.13 ± 9.98                         | 57.48 ± 10.53 | 0.480   | 53.44 ± 8.76 | 58.38 ± 9.11 | 57.19 ± 13.07      | 61.43 ± 10.06 | 57.48 ± 10.53 | 0.218             |
| <b>Topographic localization</b>        |  |                                      |               |         |              |              |                    |               |               |                   |
| CQ                                     | 2 (6.3%)   | 1 (3.3%)                             | 3 (4.8%)      | 0.680   | 0 (0.0%)     | 3 (18.7%)    | 0 (0.0%)           | 0 (0.0%)      | 3 (4.8%)      | 0.052             |
| IOQ                                    | 1 (3.1%)   | 3 (10.0%)                            | 4 (6.5%)      |         | 0 (0.0%)     | 1 (6.3%)     | 2 (12.5%)          | 1 (7.1%)      | 4 (6.5%)      |                   |
| SOQ                                    | 13 (40.6%)   | 8 (26.7%)                            | 21 (33.9%)    |         | 5 (31.2%)    | 1 (6.3%)     | 9 (56.3%)          | 6 (42.9%)     | 21 (33.9%)    |                   |
| SIQ                                    | 2 (6.3%)   | 2 (6.7%)                             | 4 (6.5%)      |         | 0 (0.0%)     | 2 (12.5%)    | 1 (6.3%)           | 1 (7.1%)      | 4 (6.5%)      |                   |
| Multiple                               | 12 (37.5%)   | 15 (50.0%)                           | 27 (43.5%)    |         | 11 (68.8%)   | 8 (50.0%)    | 3 (18.7%)          | 5 (35.7%)     | 27 (43.5%)    |                   |
| Other                                  | 2 (6.2%)   | 1 (3.3%)                             | 3 (4.8%)      |         | 0 (0.0%)     | 1 (6.3%)     | 1 (6.3%)           | 1 (7.1%)      | 3 (4.8%)      |                   |
| <b>Laterality</b>                      |  |                                      |               |         |              |              |                    |               |               |                   |
| Right                                  | 17 (53.1%)   | 15 (50.0%)                           | 32 (51.6%)    | 0.806   | 10 (62.5%)   | 7 (43.8%)    | 7 (43.8%)          | 8 (57.1%)     | 32 (51.6%)    | 0.632             |
| Left                                   | 15 (46.9%)   | 15 (50.0%)                           | 30 (48.4%)    |         | 6 (37.5%)    | 9 (56.2%)    | 9 (56.2%)          | 6 (42.9%)     | 30 (48.4%)    |                   |
| <b>Pathological stage</b>              |  |                                      |               |         |              |              |                    |               |               |                   |
| Stage I                                | 16 (50.0%)   | 20 (69.0%)                           | 36 (59.0%)    | 0.321   | 11 (68.8%)   | 14 (87.5%)   | 6 (40.0%)          | 5 (35.7%)     | 36 (59.0%)    | <b>0.037*</b>     |
| Stage II                               | 14 (43.8%)   | 8 (27.6%)                            | 22 (36.1%)    |         | 5 (31.2%)    | 2 (12.5%)    | 8 (53.3%)          | 7 (50.0%)     | 22 (36.1%)    |                   |
| Stage III                              | 2 (6.2%)   | 1 (3.4%)                             | 3 (4.9%)      |         | 0 (0.0%)     | 0 (0.0%)     | 1 (6.7%)           | 2 (14.3%)     | 3 (4.9%)      |                   |
| <b>Histological grade</b>              |  |                                      |               |         |              |              |                    |               |               |                   |
| Grade II                               | 17 (53.1%)   | 20 (66.7%)                           | 37 (59.7%)    | 0.227   | 16 (100.0%)  | 16 (100.0%)  | 2 (12.5%)          | 3 (21.4%)     | 37 (59.7%)    | <b>&lt;0.001*</b> |
| Grade III                              | 15 (46.9%)   | 10 (33.3%)                           | 25 (40.3%)    |         | 0 (0.0%)     | 0 (0.0%)     | 14 (87.5%)         | 11 (78.6%)    | 25 (40.3%)    |                   |
| <b>Carcinoma <i>in situ</i></b>        |  |                                      |               |         |              |              |                    |               |               |                   |
| Presence                               | 11 (34.4%)   | 13 (43.3%)                           | 24 (38.7%)    | 0.469   | 9 (56.3%)    | 4 (25.0%)    | 5 (31.3%)          | 6 (42.9%)     | 24 (38.7%)    | 0.282             |
| Size. Cm (Mean ± SD)                   | 1.16 ± 2.02  | 1.55 ± 2.91                          | 1.35 ± 2.47   | 0.649   | 1.70 ± 1.99  | 0.99 ± 1.95  | 1.61 ± 3.79        | 1.04 ± 1.63   | 1.35 ± 2.47   | 0.798             |
| Extensive                              | 9 (28.1%)  | 11 (36.7%)                           | 20 (32.3%)    | 0.472   | 8 (50.0%)    | 4 (25.0%)    | 4 (25.0%)          | 4 (28.6%)     | 20 (32.3%)    | 0.367             |
| Microcalcifications                    | 14 (43.8%)   | 14 (46.7%)                           | 28 (45.2%)    | 0.818   | 9 (56.3%)    | 9 (56.3%)    | 4 (25.0%)          | 6 (42.9%)     | 28 (45.2%)    | 0.236             |

|  |               |               |               |       |               |               |             |             |               |               |
|--|---------------|---------------|---------------|-------|---------------|---------------|-------------|-------------|---------------|---------------|
| Necrosis                                   | 20 (62.5%)    | 19 (63.3%)    | 39 (62.9%)    | 0.946 | 10 (62.5%)    | 9 (56.3%)     | 7 (43.8%)   | 13 (92.9%)  | 39 (62.9%)    | <b>0.042*</b> |
| <b>Invasive carcinoma</b>                  |               |               |               |       |               |               |             |             |               |               |
| Size. Cm (Mean ± SD)                       | 1.94 ± 0.71   | 1.57 ± 0.75   | 1.76 ± 0.75   | 0.465 | 1.54 ± 0.34   | 1.58 ± 0.45   | 1.97 ± 0.78 | 1.97 ± 1.16 | 1.76 ± 0.75   | 0.197         |
| Multifocality                              | 7 (21.9%)     | 7 (23.3%)     | 14 (22.6%)    | 0.891 | 5 (31.3%)     | 3 (18.8%)     | 2 (12.5%)   | 4 (28.6%)   | 14 (22.6%)    | 0.564         |
| Invasion                                   | 11 (34.4%)    | 8 (26.7%)     | 19 (30.6%)    | 0.511 | 5 (31.3%)     | 6 (37.5%)     | 3 (18.8%)   | 5 (35.7%)   | 19 (30.6%)    | 0.661         |
| <b>Metastatic nodes</b>                    |               |               |               |       |               |               |             |             |               |               |
| 0  | 20 (62.5%)    | 21 (70.0%)    | 41 (66.2%)    | 0.364 | 9 (56.3%)     | 11 (68.8%)    | 13 (81.3%)  | 8 (57.1%)   | 41 (66.2%)    | 0.144         |
| 1-3  | 10 (31.3%)    | 8 (26.7%)     | 18 (29.0%)    |       | 7 (43.7%)     | 5 (31.2%)     | 2 (12.5%)   | 4 (28.6%)   | 18 (29.0%)    |               |
| 4-9  | 0 (0.0%)      | 1 (3.3%)      | 1 (1.6%)      |       | 0 (0.0%)      | 0 (0.0%)      | 1 (6.2%)    | 0 (0.0%)    | 1 (1.6%)      |               |
| >10  | 2 (6.2%)      | 0 (0.0%)      | 2 (3.2%)      |       | 0 (0.0%)      | 0 (0.0%)      | 0 (0.0%)    | 2 (14.3%)   | 2 (3.2%)      |               |
| Size cm (Mean ± SD)<br>(Larger metastasis) | 12.66 ± 33.16 | 10.23 ± 30.11 | 11.48 ± 31.49 | 0.764 | 18.83 ± 39.78 | 24.77 ± 44.26 | 0.54 ± 1.22 | 0.41 ± 0.64 | 11.48 ± 31.49 | 0.056         |

(B)

|                                 | Luminal A<br>Normal<br>weight | Luminal A<br>Obese | Luminal B<br>Normal<br>weight | Luminal B<br>Obese | Triple<br>Negative<br>Normal<br>weight | Triple<br>negative<br>Obese | HER2+<br>Normal<br>weight | HER2+ Obese   | Total         | p-value |
|---------------------------------|-------------------------------|--------------------|-------------------------------|--------------------|--|-----------------------------|---------------------------|---------------|---------------|---------|
| n (%)                           | 8 (12.9%)                     | 8 (12.9%)          | 8 (12.9%)                     | 8 (12.9%)          | 8 (12.9%)                              | 8 (12.9%)                   | 8 (12.9%)                 | 6 (9.7%)      | 62 (100%)     |         |
| Age at diagnosis<br>(Mean ± SD) | 52.13 ± 8.71                  | 54.75 ± 9.19       | 59.25 ± 10.51                 | 57.50 ± 8.09       | 56.88 ± 14.93                          | 57.50 ± 11.95               | 59.25 ± 10.24             | 64.33 ± 10.09 | 57.48 ± 10.53 | 0.604   |
| Topographic localization        |                               |                    |                               |                    |  |                             |                           |               |               |         |
| CQ                              | 0 (0.0%)                      | 0 (0.0%)           | 2 (25.0%)                     | 1 (12.5%)          | 0 (0.0%)                               | 0 (0.0%)                    | 0 (0.0%)                  | 0 (0.0%)      | 3 (4.8%)      | 0.075   |
| IOQ                             | 0 (0.0%)                      | 0 (0.0%)           | 0 (0.0%)                      | 1 (12.5%)          | 0 (0.0%)                               | 2 (25.0%)                   | 1 (12.5%)                 | 0 (0.0%)      | 4 (6.5%)      |         |
| SOQ                             | 3 (37.5%)                     | 2 (25.0%)          | 0 (0.0%)                      | 1 (12.5%)          | 4 (50.0%)                              | 5 (62.5%)                   | 6 (75.0%)                 | 0 (0.0%)      | 21 (33.9%)    |         |
| SIQ                             | 0 (0.0%)                      | 0 (0.0%)           | 1 (12.5%)                     | 1 (12.5%)          | 1 (12.5%)                              | 0 (0.0%)                    | 0 (0.0%)                  | 1 (16.7%)     | 4 (6.5%)      |         |
| Multiple                        | 5 (62.5%)                     | 6 (75.0%)          | 4 (50.0%)                     | 4 50.0%)           | 2 (25.0%)                              | 1 (12.5%)                   | 1 (12.5%)                 | 4 (66.7%)     | 27 (43.5%)    |         |
| Other                           | 0 (0.0%)                      | 0 (0.0%)           | 1 (12.5%)                     | 0 (0.0%)           | 1 (12.5%)                              | 0 (0.0%)                    | 0 (0.0%)                  | 1 (16.7%)     | 3 (4.8%)      |         |
| Laterality                      |                               |                    |                               |                    |  |                             |                           |               |               |         |
| Right                           | 4 (50.0%)                     | 6 (75.0%)          | 3 (37.5%)                     | 4 (50.0%)          | 5 (62.5%)                              | 2 (25.0%)                   | 5 (62.5%)                 | 3 (50.0%)     | 32 (51.6%)    | 0.606   |
| Left                            | 4 (50.0%)                     | 2 (25.0%)          | 5 (62.5%)                     | 4 (50.0%)          | 3 (37.5%)                              | 6 (75.0%)                   | 3 (37.5%)                 | 3 (50.0%)     | 30 (48.4%)    |         |
| Pathological stage              |                               |                    |                               |                    |  |                             |                           |               |               |         |
| Stage I                         | 6 (75.0%)                     | 5 (62.5%)          | 6 (75.0%)                     | 8 (100.0%)         | 3 (37.5%)                              | 3 (42.9%)                   | 1 (12.5%)                 | 4 (66.7%)     | 36 (59.0%)    | 0.051   |

|                                 |  |               |               |               |               |             |             |             |             |               |                   |
|---------------------------------|--|---------------|---------------|---------------|---------------|-------------|-------------|-------------|-------------|---------------|-------------------|
|                                 | Stage II                                   | 2 (25.0%)     | 3 (37.5%)     | 2 (25.0%)     | 0 (0.0%)      | 5 (62.5%)   | 3 (42.9%)   | 5 (62.5%)   | 2 (33.3%)   | 22 (36.1%)    |                   |
|                                 | Stage II                                   | 0 (0.0%)      | 0 (0.0%)      | 0 (0.0%)      | 0 (0.0%)      | 0 (0.0%)    | 1 (14.3%)   | 2 (25.0%)   | 0 (0.0%)    | 3 (4.9%)      |                   |
| <b>Histological grade</b>       |  |               |               |               |               |             |             |             |             |               |                   |
|                                 | Grade II                                   | 8 (100.0%)    | 8 (100.0%)    | 8 (100.0%)    | 8 (100.0%)    | 0 (0.0%)    | 2 (25.0%)   | 1 (12.5%)   | 2 (33.3%)   | 37 (59.7%)    | <b>&lt;0.001*</b> |
|                                 | Grade III                                  | 0 (0.0%)      | 0 (0.0%)      | 0 (0.0%)      | 0 (0.0%)      | 8 (100.0%)  | 6 (75.0%)   | 7 (87.5%)   | 4 (66.7%)   | 25 (40.3%)    |                   |
| <b>Carcinoma <i>in situ</i></b> |  |               |               |               |               |             |             |             |             |               |                   |
|                                 | Presence                                   | 4 (50.0%)     | 5 (62.5%)     | 3 (37.5%)     | 1 (12.5%)     | 1 (12.5%)   | 4 (50.0%)   | 3 (37.5%)   | 3 (50.0%)   | 24 (38.7%)    | 0.357             |
|                                 | Size. cm (Mean ± SD)                       | 1.79 ± 2.48   | 1.61 ± 1.53   | 1.69 ± 2.52   | 0.30 ± 0.85   | 0.33 ± 0.92 | 2.9 ± 5.12  | 0.83 ± 1.73 | 1.33 ± 1.60 | 1.35 ± 2.47   | 0.463             |
|                                 | Extensive                                  | 4 (50.0%)     | 4 (50.0%)     | 3 (37.5%)     | 1 (12.5%)     | 0 (0.0%)    | 4 (50.0%)   | 2 (25.0%)   | 2 (33.3%)   | 20 (32.3%)    | 0.253             |
|                                 | Microcalcifications                        | 4 (50.0%)     | 5 (62.5%)     | 6 (75.0%)     | 3 (37.5%)     | 1 (12.5%)   | 3 (37.5%)   | 3 (37.5%)   | 3 (50.0%)   | 28 (45.2%)    | 0.333             |
|                                 | Necrosis                                   | 5 (62.5%)     | 5 (62.5%)     | 5 (62.5%)     | 4 (50.0%)     | 2 (25.0%)   | 5 (62.5%)   | 8 (100.0%)  | 5 (83.3%)   | 39 (62.9%)    | 0.126             |
| <b>Invasive carcinoma</b>       |  |               |               |               |               |             |             |             |             |               |                   |
|                                 | Size. cm (Mean ± SD)                       | 1.56 ± 0.28   | 1.53 ± 0.40   | 1.74 ± 0.50   | 1.41 ± 0.36   | 2.2 ± 0.60  | 1.74 ± 0.92 | 2.25 ± 1.07 | 1.60 ± 1.27 | 1.76 ± 0.75   | 0.210             |
|                                 | Multifocality                              | 3 (37.5%)     | 2 (25.0%)     | 1 (12.5%)     | 2 (25.0%)     | 0 (0.0%)    | 2 (25.0%)   | 3 (37.5%)   | 1 (16.7%)   | 14 (22.6%)    | 0.656             |
|                                 | Invasion                                   | 3 (37.5%)     | 2 (25.0%)     | 3 (37.5%)     | 3 (37.5%)     | 1 (12.5%)   | 2 (25.0%)   | 4 (50.0%)   | 1 (16.7%)   | 19 (30.6%)    | 0.783             |
| <b>Metastatic nodes</b>         |  |               |               |               |               |             |             |             |             |               |                   |
|                                 | 0  | 5 (62.5%)     | 4 (50.0%)     | 6 (75.0%)     | 5 (62.5%)     | 7 (87.5%)   | 6 (75.0%)   | 2 (25.0%)   | 6 (100.0%)  | 41 (66.2%)    | 0.082             |
|                                 | 1-3  | 3 (37.5%)     | 4 (50.0%)     | 2 (25.0%)     | 3 (37.5%)     | 1 (12.5%)   | 1 (12.5%)   | 4 (50.0%)   | 0 (0,0%)    | 18 (29.0%)    |                   |
|                                 | 4-9  | 0 (0,0%)      | 0 (0,0%)      | 0 (0,0%)      | 0 (0,0%)      | 0 (0,0%)    | 1 (12.5%)   | 0 (0,0%)    | 0 (0,0%)    | 1 (1.6%)      |                   |
|                                 | >10  | 0 (0,0%)      | 0 (0,0%)      | 0 (0,0%)      | 0 (0,0%)      | 0 (0,0%)    | 0 (0,0%)    | 2 (25.0%)   | 0 (0,0%)    | 2 (3.2%)      |                   |
|                                 | Size cm (Mean ± SD)<br>(Larger metastasis) | 24.93 ± 45.72 | 12.74 ± 34.86 | 24.75 ± 45.83 | 24.79 ± 45.81 | 0.24 ± 0.67 | 0.84 ± 1.59 | 0.73 ± 0.70 | 0.00 ± 0.00 | 11.48 ± 31.49 | 0.340             |

Legend: SD – Standard Deviation; CQ – Central Quadrant; IOQ – Inferior Outer Quadrant; SOQ – Superior Outer Quadrant; SIQ – Superior Inner Quadrant; Statistical significance highlighted in bold (p-value<0.05).