**Supplemental Table 1. Distribution of FOXA1 protein expression in H-scores in ER+ and ER- tumors, by specimen and tissue types**

1. **ER+ tumors**

| Specimen type | N, total | Tissue type | N | Mean | Std Dev | Minimum | Maximum |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Whole section | 435 | |  | | --- | | Tumor | | DCIS | | Adjacent normal | | |  | | --- | | 298 | | 142 | | 105 | | |  | | --- | | 189 | | 189 | | 73 | | |  | | --- | | 57 | | 66 | | 43 | | |  | | --- | | 0 | | 2 | | 0.3 | | |  | | --- | | 278 | | 284 | | 205 | |
| TMAs | 525 | |  | | --- | | Tumor | | DCIS | | Adjacent normal | | |  | | --- | | 443 | | 85 | | 88 | | |  | | --- | | 188 | | 148 | | 50 | | |  | | --- | | 71 | | 85 | | 45 | | |  | | --- | | 0.2 | | 0 | | 0 | | |  | | --- | | 295 | | 290 | | 224 | |

1. **ER- tumors**

| Specimen type | N, total | Tissue type | N | Mean | Std Dev | Minimum | Maximum |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Whole section | 125 | |  | | --- | | Tumor | | DCIS | | Adjacent normal | | |  | | --- | | 98 | | 29 | | 42 | | |  | | --- | | 91 | | 166 | | 62 | | |  | | --- | | 95 | | 80 | | 44 | | |  | | --- | | 0 | | 0.4 | | 0 | | |  | | --- | | 277 | | 286 | | 179 | |
| TMAs | 223 | |  | | --- | | Tumor | | DCIS | | Adjacent normal | | |  | | --- | | 202 | | 23 | | 59 | | |  | | --- | | 52 | | 108 | | 48 | | |  | | --- | | 82 | | 97 | | 42 | | |  | | --- | | 0 | | 1.7 | | 0 | | |  | | --- | | 288 | | 296 | | 216 | |

**Supplemental Table 2. The association of differences in FOXA1 protein expression between tumor and adjacent-normal tissue with ER+ and non-TNBC**

|  |  |  |  |
| --- | --- | --- | --- |
| Subtype | N | OR (95% CI)1, each 10 point increase in H-score | P-value |
|  |  |  |  |
| ER+ (vs. ER-) | 244 | 1.13 (1.09-1.19) | <0.001 |
|  |  |  |  |
| Non-TNBC (vs. TNBC) | 218 | 1.22 (1.14-1.31) | <0.001 |
|  |  |  |  |

1 Logistic regression adjusting for age, race, grade, and stage.

**Supplemental** **Table 3. FOXA1 protein expression in relation to parity and history of breastfeeding, additionally adjusting for tumor grade, breast cancer stage, and specimen type**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | ER+ tumors | | | |  | ER- tumors | | | |
|  |  |  | Model 11 |  | Model 22 |  |  | Model 11 |  | Model 22 |  |
|  |  | N | β (95% CI) | P-value | β (95% CI) | P-value | N | β (95% CI) | P-value | β (95% CI) | P-value |
| Parous vs. Nulliparous (ref.) |  | 869 | -6.5  (-16.7, 4.6) | 0.26 | -6.1  (-16.8, 4.5) | 0.26 | 328 | -17.6  (-43.2, 7.9) | 0.18 | -17.0  (-44.4, 10.4) | 0.22 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Number of births (1, 2, 3+) |  | 685 | -7.8  (-14.6, -0.9) | 0.026 | -7.8  (-14.7, -1.0) | 0.026 | 272 | -7.9  (-22.0, 6.2) | 0.27 | -7.0  (-21.5, 7.5) | 0.34 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Number of birth stratified by history of breastfeeding (BF)2 |  |  |  |  |  |  |  |  |  |  |  |
| Never BF |  | 355 | -11.0  (-21.0, -1.1) | 0.031 | -10.9  (-20.9, -0.8) | 0.034 | 146 | -13.9  (-37.5, 9.7) | 0.25 | -16.2  (-40.4, 7.9) | 0.19 |
| Ever BF |  | 330 | -5.6  (-15.5, 4.3) | 0.27 | -5.3  (-15.3, 4.6) | 0.29 | 126 | 5.4  (-14.5, 25.2) | 0.53 | 10.0  (-9.6, 29.7) | 0.32 |

1 Generalized linear models adjusting for age, race, tumor grade, and breast cancer stage.

1 Generalized linear models adjusting for age, race, tumor grade, breast cancer stage, and specimen type.

**Supplemental Table 4. FOXA1 protein expression in relation to age at menarche, age at first live birth, and breastfeeding**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | ER+ tumors |  |  | ER- tumors |  |
|  |  | N | β (95% CI)1 | P-value | N | β (95% CI)1 | P-value |
| Age at menarche, years |  | 957 |  |  | 348 |  |  |
| <11 |  |  | Ref. |  |  | Ref. |  |
| 11-12 |  |  | -6.7 (-20.7, 7.2) | 0.35 |  | 13.1 (-15.9, 42.1) | 0.38 |
| ≥13 |  |  | -2.7 (-16.4, 11.0) | 0.70 |  | 13.4 (-14.9, 41.8) | 0.35 |
|  |  |  |  |  |  |  |  |
| Age at first live birth, years |  | 756 |  |  | 289 |  |  |
| <24 |  |  | Ref. |  | Ref. |  |  |
| 25-29 |  |  | -2.6 (-14.6, 9.4) | 0.68 |  | 9.9 (-16.7, 36.4) | 0.47 |
| ≥30 |  |  | 0.5 (-13.4, 14.4) | 0.95 |  | 40.7 (7.2, 74.3) | 0.017 |
|  |  |  |  |  |  |  |  |
| Breastfeeding (among parous women) |  | 756 |  |  | 289 |  |  |
| Never |  |  | Ref. |  |  | Ref. |  |
| Ever |  |  | 0.2 (-9.9, 10.4) |  | 0.97 | -6.7 (-29.0, 15.5) | 0.55 |

1 Generalized linear models adjusting for age and race.