**Table S1.** List of 108 microRNAs associated with breast cancer.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **hsa-let-7c** | **hsa-mir-139** | **hsa-mir-182** | **hsa-mir-26a-1** | **hsa-mir-34a** | **hsa-mir-424** | **hsa-mir-574** | **hsa-mir-944** |
| **hsa-let-7g** | **hsa-mir-142** | **hsa-mir-183** | **hsa-mir-299** | **hsa-mir-3607** | **hsa-mir-425** | **hsa-mir-582** | **hsa-mir-96** |
| **hsa-mir-100** | **hsa-mir-143** | **hsa-mir-187** | **hsa-mir-301a** | **hsa-mir-361** | **hsa-mir-4326** | **hsa-mir-585** | **hsa-mir-99a** |
| **hsa-mir-101** | **hsa-mir-144** | **hsa-mir-191** | **hsa-mir-301b** | **hsa-mir-3615** | **hsa-mir-449b** | **hsa-mir-589** |  |
| **hsa-mir-10b** | **hsa-mir-145** | **hsa-mir-193a** | **hsa-mir-30e** | **hsa-mir-3677** | **hsa-mir-449c** | **hsa-mir-592** |  |
| **hsa-mir-125b-2** | **hsa-mir-146b** | **hsa-mir-195** | **hsa-mir-3176** | **hsa-mir-3690** | **hsa-mir-452** | **hsa-mir-615** |  |
| **hsa-mir-126** | **hsa-mir-147b** | **hsa-mir-19b-1** | **hsa-mir-3180-1** | **hsa-mir-374a** | **hsa-mir-454** | **hsa-mir-655** |  |
| **hsa-mir-1260b** | **hsa-mir-148b** | **hsa-mir-200a** | **hsa-mir-3184** | **hsa-mir-376a-1** | **hsa-mir-455** | **hsa-mir-671** |  |
| **hsa-mir-128-1** | **hsa-mir-151** | **hsa-mir-202** | **hsa-mir-324** | **hsa-mir-376b** | **hsa-mir-483** | **hsa-mir-7-1** |  |
| **hsa-mir-1301** | **hsa-mir-152** | **hsa-mir-204** | **hsa-mir-330** | **hsa-mir-376c** | **hsa-mir-484** | **hsa-mir-766** |  |
| **hsa-mir-1307** | **hsa-mir-154** | **hsa-mir-21** | **hsa-mir-331** | **hsa-mir-377** | **hsa-mir-486** | **hsa-mir-877** |  |
| **hsa-mir-130a** | **hsa-mir-155** | **hsa-mir-210** | **hsa-mir-335** | **hsa-mir-378** | **hsa-mir-488** | **hsa-mir-891a** |  |
| **hsa-mir-130b** | **hsa-mir-15b** | **hsa-mir-215** | **hsa-mir-339** | **hsa-mir-421** | **hsa-mir-497** | **hsa-mir-92b** |  |
| **hsa-mir-133a-1** | **hsa-mir-181a-1** | **hsa-mir-218-1** | **hsa-mir-33b** | **hsa-mir-422a** | **hsa-mir-500a** | **hsa-mir-93** |  |
| **hsa-mir-136** | **hsa-mir-181b-1** | **hsa-mir-224** | **hsa-mir-345** | **hsa-mir-423** | **hsa-mir-551b** | **hsa-mir-940** |  |

**Table S2.** Clinicopathological significance of histological grade in the present TCGA cohort.

|  |  |  |
| --- | --- | --- |
| **Factors** | **Histological grade** | **Significance** |
| **Low** | **High** | **Total** | ***p*-value** |
| **Age** | **> 60** | **142 (58.4%)** | **101 (41.6%)** | **243** | **0.62** |
| **< 60** | **114 (61.0%)** | **73 (39.0%)** | **187** |
| **Tumor size** | **pT2-4** | **176 (55.9%)** | **139 (44.1%)** | **315** | **0.011** |
| **pT1** | **80 (69.6%)** | **35 (30.4%)** | **115** |
| **Nodal status** | **Positive** | **138 (61.1%)** | **88 (38.9%)** | **226** | **0.62** |
| **Negative** | **117 (58.5%)** | **83 (41.5%)** | **200** |
| **ER** | **Positive** | **237 (72.7%)** | **89 (27.3%)** | **326** | **<0.0001** |
| **Negative** | **15 (15.8%)** | **80 (84.2%)** | **95** |
| **HER2** | **Positive** | **42 (59.2%)** | **29 (40.8%)** | **71** | **0.89** |
| **Negative** | **188 (60.1%)** | **125 (39.9%)** | **313** |
| **Abbreviations: ER: estrogen receptor, HER2: human epidermal growth factor 2.** |

**Table S3.** Clinicopathological significance of a subgroup based on microRNAs related to histological grade.

|  |  |  |
| --- | --- | --- |
| **Factors** | **histological grade related microRNAs** | **Significance** |
| **Subgroup 1** | **Subgroup 2** | **Total** | ***p*-value** |
| **Histological grade** | **Grade 3** | **49 (28.2%)** | **125 (71.8%)** | **174** | **<0.0001** |
| **Grade 1, 2** | **152 (59.4%)** | **104 (40.6%)** | **256** |
| **Age** | **> 60** | **88 (47.1%)** | **99 (52.9%)** | **187** | **0.92** |
| **< 60** | **113 (46.5%)** | **130 (53.5%)** | **243** |
| **Tumor size** | **pT2-4** | **149 (47.3%)** | **166 (52.7%)** | **315** | **0.74** |
| **pT1** | **52 (45.2%)** | **63 (54.8%)** | **115** |
| **Nodal status** | **Positive** | **108 (47.8%)** | **118 (52.2%)** | **226** | **0.77** |
| **Negative** | **92 (46.0%)** | **108 (54.0%)** | **200** |
| **ER** | **Positive** | **172 (52.8%)** | **154 (47.2%)** | **326** | **<0.0001** |
| **Negative** | **26 (27.4%)** | **69 (72.6%)** | **95** |
| **HER2** | **Positive** | **27 (38.0%)** | **44 (62.0%)** | **71** | **0.067** |
| **Negative** | **157 (50.2%)** | **156 (49.8%)** | **313** |
| **Abbreviations: ER: estrogen receptor, HER2: human epidermal growth factor 2.** |

**Table S4.** Clinicopathological significance of miR-3677 in the present TCGA cohort.

|  |  |  |
| --- | --- | --- |
| **Factors** | **Expression of miR-3677** | **Significance** |
| **Low** | **High** | **Total** | ***p*-value** |
| **Histological grade** | **Grade 3** | **53 (30.5%)** | **121 (69.5%)** | **174** | **<0.0001** |
| **Grade 1, 2** | **162 (63.3%)** | **94 (36.7%)** | **256** |
| **Age** | **> 60** | **124 (51.0%)** | **119 (49.0%)** | **243** | **0.70** |
| **< 60** | **91 (48.7%)** | **96 (51.3%)** | **187** |
| **Tumor size** | **pT2-4** | **156 (49.5%)** | **159 (74.0%)** | **315** | **0.83** |
| **pT1** | **59 (51.3%)** | **56 (49.7%)** | **115** |
| **Nodal status** | **Positive** | **115 (50.9%)** | **111 (49.1%)** | **226** | **0.85** |
| **Negative** | **99 (49.5%)** | **101 (50.5%)** | **200** |
| **ER** | **Positive** | **181 (55.5%)** | **145 (44.5%)** | **326** | **0.00011** |
| **Negative** | **31 (32.6%)** | **64 (67.4%)** | **95** |
| **HER2** | **Positive** | **21 (29.6%)** | **50 (70.4%)** | **71** | **0.00012** |
| **Negative** | **173 (55.3%)** | **140 (44.7%)** | **313** |
| **Abbreviations: ER: estrogen receptor, HER2: human epidermal growth factor 2.** |

**Figure S1**. MA plot of miRNAs

