### Additional Table 1. Demographic, lifestyle and reproductive characteristics of breast cancer patients and controls

| Parameters                              | Cases                  | Controls                | p value  |
|-----------------------------------------|------------------------|-------------------------|----------|
|                                         | N (n)      median 95% CI Min-max | N (n)      median 95% CI Min-max |
| **Demographic and lifestyle factors**   |            |                         |          |
| Age (years)                             | 31 (31)    50 46.1; 56.7 29.0-80.0 | 115 (115) 54 49.1; 53.5 18-66 | 0.34     |
| < 50                                    | 17 (54.8%) 24 45.1; 57.9 29.0- 80.0 | 37 (32.2%) 23 47.0; 52.0 18-66 |          |
| 51-55                                   | 3 (9.70%)   26 23.0; 29.0 18- 30.3 | 26 (22.6%) 24 21.7; 23.0 16-25.0 |          |
| 56-59                                   | 3 (9.70%)   17 14.8%              | 17 (14.8%) 13 12.0; 16.0 12-48 |          |
| ≥60                                     | 8 (25.8%)   35 30.4%              | 35 (30.4%) 30 27.0; 33.0 18-50 |          |
| BMI (kg/m²)                             | 31 (13)    26.9 24.0; 29.1 16.5-34.4 | 115 (115) 26.4 26.4; 27.2 16.6-43.4 | 0.69     |
| <25                                     | 4          23.5 16.0; 22.3 16.5-25.0 | 42          23.0 21.7; 23.0 16.1-25.0 | 0.84     |
| 25-29                                   | 8          27.6 26.6; 28.9 25.8-29.6 | 42          27.6 26.9; 27.8 25.1-19.9 | 0.46     |
| ≥30                                     | 1          34.4 -                 | 31          33.2 33.1; 35.9 30.3-43.4 |          |
| n-3/n-6                                 | 31 (29)    0.5 0.4; 0.6 0.2-1.7 | 115 (115) 0.5 0.5; 0.7 0.1-2.2 | 0.31     |
| Serum cotinine (ng / ml)                | 31 (28)    11.6 33.3; 140.0 0-600.0 | 115 (96)   120 121.0; 188.0 0.0-799.0 | 0.052    |
| Smoking status                          | 31 (26)    115 (115)             | 115 (115) 115 (115)             |          |
| Never                                   | 5 (19.2%)  21 (18.3%)             | 21 (18.3%) 21 (18.3%)             |          |
| Former                                  | 3 (11.5%)  20 (17.4%)             | 20 (17.4%) 20 (17.4%)             |          |
| Current                                 | 18 (69.2%) 74 (64.3%)             | 74 (64.3%) 74 (64.3%)             |          |
| **Reproductive factors**                |            |                         |          |
| Total number of full term pregnancies   | 31(16)     2.0 1.7; 2.8 1.4 | 115 (89)   3.0 3.2; 4.1 0.0-11.0 | <0.0001  |
| Ever breastfed                          | 31(17)     115 (85)              | 115 (85) 115 (85)              |          |
| Yes (%)                                 | 15 (88.2%) 76 (89.4%)             | 76 (89.4%) 76 (89.4%)             | 0.89     |
| Menopausal status                      | 31                      | 115                      |          |
| Premenopausal (%)                      | 17 (54.8%) 42 (36.5%)             | 42 (36.5%) 42 (36.5%)             | 0.098    |
| Postmenopausal (%)                     | 14 (45.2%) 73 (63.5%)             | 73 (63.5%) 73 (63.5%)             |          |
| Serum E2 (nmol / l)                    | 31(24)     0.09 0.09; 0.23 0.03-0.51 | 115(59)    0.07 0.05; 0.16 0.01-1.59 | 0.10     |
| Premenopausal                           | 11         0.21 0.13; 0.34 0.03-0.44 | 11         0.13 0.05; 0.55 0.12-1.59 | 0.52     |
| Postmenopausal                          | 13         0.06 0.02; 0.17 0.03-0.51 | 48         0.07 0.06; 0.08 0.01-0.17 | 0.73     |

N: total number of subjects, n: number of subjects having information for the corresponding parameters.

BMI: body mass index

#: Menopausal status was unknown for 36 of the samples (11 cases and 26 controls): among these, 31 women were between 18-42 years old and 5 women between 66-80 years old. In this study, women who had missing information on menopausal status were designated premenopausal if they were between 18-42 years old, and considered postmenopausal if they were between 66-80 years old.
Additional Table 2. Odds ratios of breast cancer and 95% confidence intervals associated with ln-transformed PFOS and PFOA among breast cancer patients and controls (ln-PFOS and ln-PFOA as continuous variables)

| Gene     | Genotype          | Exposure | N (ca/co) | Age adjusted | 95% CI     | p    |
|----------|-------------------|----------|-----------|--------------|------------|------|
| CYP1A1   | Ile/Ile           | PFOS     | 4/28      | 1.71         | 0.47-6.32  | 0.418|
|          | Ile/Val+Val/Val   | PFOS     | 26/68     | 2.63         | 1.46-4.75  | 0.001|
|          | Val/Met+Met/Val   | PFOS     | 26/68     | 1.97         | 0.97-3.32  | 0.064|
|          | Val/Met+Met/Val   | PCBs     | 4/32      | 0.68         | 0.12-3.76  | 0.663|
|          | Val/Met+Met/Val   | PCBs     | 25/81     | 1.05         | 0.50-2.19  | 0.898|
|          | Val/Met+Met/Val   | OCPs     | 4/32      | 0.78         | 0.17-3.50  | 0.747|
|          | Val/Met+Met/Val   | OCPs     | 25/81     | 1.72         | 0.76-3.89  | 0.193|
| CYP1B1   | Leu/Leu           | PFOS     | 26/66     | 1.95         | 1.09-3.48  | 0.025|
|          | Leu/Val+Val/Val   | PFOS     | 5/28      | 8.67         | 1.33-56.6  | 0.024|
|          | Leu/Val+Val/Val   | PFOA     | 26/66     | 1.15         | 0.64-2.07  | 0.645|
|          | Leu/Val+Val/Val   | PFOA     | 5/28      | 10.10        | 1.25-81.3  | 0.030|
|          | Leu/Val+Val/Val   | PCBs     | 26/79     | 0.97         | 0.47-2.02  | 0.937|
|          | Leu/Val+Val/Val   | PCBs     | 4/32      | 0.39         | 0.04-3.59  | 0.408|
|          | Leu/Val+Val/Val   | OCPs     | 26/79     | 1.50         | 0.67-3.36  | 0.320|
|          | Leu/Val+Val/Val   | OCPs     | 4/32      | 1.08         | 0.20-5.70  | 0.931|
| COMT     | Val/Val           | PFOS     | 7/17      | 2.70         | 0.83-8.79  | 0.100|
|          | Val/Met+Met/Met   | PFOS     | 24/79     | 2.65         | 1.44-4.89  | 0.002|
|          | Val/Met+Met/Met   | PFOA     | 7/17      | 1.10         | 0.34-3.40  | 0.909|
|          | Val/Met+Met/Met   | PFOA     | 24/79     | 1.88         | 0.98-3.60  | 0.055|
|          | Val/Met+Met/Met   | PCBs     | 6/19      | 1.96         | 0.33-11.6  | 0.457|
|          | Val/Met+Met/Met   | PCBs     | 24/94     | 1.00         | 0.49-2.05  | 0.994|
|          | Val/Met+Met/Met   | OCPs     | 6/19      | 2.64         | 0.32-21.1  | 0.368|
|          | Val/Met+Met/Met   | OCPs     | 24/94     | 1.53         | 0.72-3.25  | 0.267|
| CYP17    | A1A1              | PFOS     | 12/22     | 4.89         | 1.28-18.7  | 0.020|
|          | A1A2+A2A2         | PFOS     | 18/74     | 2.21         | 1.19-4.12  | 0.013|
|          | A1A1              | PFOA     | 12/22     | 2.11         | 0.73-6.01  | 0.166|
|          | A1A2+A2A2         | PFOA     | 18/74     | 1.48         | 0.76-2.89  | 0.252|
|          | A1A1              | PCBs     | 12/24     | 1.56         | 0.55-4.45  | 0.402|
|          | A1A2+A2A2         | PCBs     | 17/89     | 0.94         | 0.39-2.23  | 0.886|
|          | A1A1              | OCPs     | 12/24     | 1.74         | 0.53-5.67  | 0.361|
|          | A1A2+A2A2         | OCPs     | 17/89     | 1.68         | 0.68-4.15  | 0.259|
| CYP19    | CC                | PFOS     | 23/63     | 2.65         | 1.39-5.06  | 0.003|
|          | CT+TT             | PFOS     | 8/34      | 2.54         | 0.92-7.04  | 0.073|
|          | CT+TT             | PFOA     | 23/63     | 1.37         | 0.71-2.63  | 0.346|
|          | CT+TT             | PCBs     | 8/34      | 2.47         | 0.82-7.42  | 0.106|
|          | CT+TT             | OCPs     | 22/79     | 1.07         | 0.51-2.26  | 0.862|
|          | CT+TT             | OCPs     | 8/35      | 1.16         | 0.32-4.21  | 0.821|
|          | CC                | OCPs     | 22/79     | 1.55         | 0.70-3.41  | 0.279|
|          | CT+TT             | OCPs     | 8/35      | 1.90         | 0.45-7.99  | 0.380|
| CYP19_TTTA (TTTA)n | (TTTA)<sub>8,10</sub> | PFOS | 27/64 | 2.58 | 1.40-4.75 | 0.002 |
|          | (TTTA)<sub>11,13</sub> | PFOS | 4/24 | 41.9 | 0.42-4203 | 0.112 |
|          | (TTTA)<sub>8,10</sub> | PFOA | 27/64 | 1.30 | 0.72-2.34 | 0.381 |
|          | (TTTA)<sub>11,13</sub> | PFOA* | 4/24 | 1.88 | 0.48-7.33 | 0.363 |
|          | (TTTA)<sub>8,10</sub> | PCBs | 26/76 | 1.05 | 0.51-2.18 | 0.892 |
|          | (TTTA)<sub>11,13</sub> | PCBs | 4/25 | 1.54 | 0.23-10.3 | 0.657 |
|          | (TTTA)<sub>8,10</sub> | OCPs | 26/76 | 1.65 | 0.75-3.63 | 0.215 |
|          | (TTTA)<sub>11,13</sub> | OCPs | 4/25 | 1.97 | 0.27-14.3 | 0.504 |

Ca: case; Co: control; CI: Confidence interval; OCPs: sum of 8 organochlorine pesticides; PCBs: sum of 12 PCBs