Data Article

Data on expression of genes involved in estrogen and progesterone action, inflammation and differentiation according to demographic, histopathological and clinical characteristics of endometrial cancer patients

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Abstract

Endometrial cancer is the sixth most common cancer in women worldwide. It is associated with aberrant actions of steroid hormones, estrogens and progesterone, but also with enhanced inflammation and reduced cellular differentiation. Here, we show data on demographic and histopathological characteristics of 51 patients with endometrial cancer, together with data on correlations between the expression of 38 genes involved in estrogen and progesterone actions, inflammation and differentiation, and demographic characteristics. We also show data on changes in gene expression of these 38 genes according to histopathological and clinical characteristics of these patients. This article includes data referenced in the manuscript entitled »STAR and AKR1B10 are down-regulated in high-grade endometrial cancer by Sinreiha et al. (in press) [1].

Keywords:
- Gene expression
- Endometrial cancer
- Estrogens
- Progesterone
- Inflammation
- Differentiation

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Specifications Table

| Subject area                             | Biochemistry, Molecular biology |
|------------------------------------------|---------------------------------|
| More specific subject area               | Molecular endocrinology, Gynecological endocrinology |
| Type of data                             | Tables                          |
| How data was acquired                    | Clinical and histopathological data was obtained from the patients’ medical and histopathological records, respectively. The gene expression data obtained by quantitative real-time PCR was statistically analyzed. |
| Data format                              | Analyzed                        |
| Experimental factors                    |                                 |
| Experimental features                   | Ratios for expression of 38 genes in samples of endometrial cancer versus adjacent control endometrium were calculated and this data was statistically analyzed. |
| Data source location                     | Ljubljana, Slovenia             |
| Data accessibility                       | The statistically analyzed data is available within this article and the raw expression data may be provided upon request. |

Value of the data

- Data on correlations between the expression ratios of these 38 genes and demographic characteristics may be helpful for explanation of different etiological factors identified in epidemiological studies.
- Data on changes in the expression ratios of these 38 genes according to histopathological and clinical data may lay foundation for further investigations of individual players of the individual pathophysiological processes.

1. Data

We provide data on demographic, histopathological and clinical characteristic of 51 endometrial cancer patients treated at the University Medical Centre Ljubljana, at the Division of Gynaecology and Obstetrics. Demographic (age, body mass, BMI, menopausal status, parity), histopathological and clinical data (histological type and grade of tumor, depth of myometrial invasion, presence of lymphovascular invasion, FIGO stage) (Table 1) together with data on statistical analysis of gene expression ratios (Tables 2–11) are included. The study was approved by the National Medical Ethics Committee of the Republic of Slovenia.

1.1. Demographic, histopathological and clinical data

The demographic, histopathological and clinical characteristics are given in Table 1. For the 51 patients, the mean age was 63.16 years (SD, 13.33 years; range, 26.72–83.58 years), the mean body weight was 81.24 kg (SD, 17.25 kg; range, 51–130 kg), and the mean BMI was 30.63 kg/m² (SD,
6.95 kg/m²; range, 19.37–48.93 kg/m²). According to the WHO definitions, of the 46 patients with BMI data, 10 (21.7%) were within the normal range (BMI, 18.5–25.0 kg/m²), 12 (26.1%) were overweight (BMI, 25–30 kg/m²), and 24 (52.2%) were obese (BMI, > 30 kg/m²), with 15 (32.6%) as moderately obese (BMI, 30–35 kg/m²), 5 (10.9%) as severely obese (BMI, 35–40 kg/m²), and 4 (8.7%) as very severely obese (BMI, > 40 kg/m²).

Table 1
Demographic, histopathological and clinical characteristics of the endometrial cancer patients.

| Sample | Age | Body mass | BMI | Sample Age | Body mass | BMI | Sample Age | Body mass | BMI | Sample Age | Body mass | BMI | Sample Age | Body mass | BMI | Sample Age | Body mass | BMI | Sample Age | Body mass | BMI |
|--------|-----|-----------|-----|------------|-----------|-----|------------|-----------|-----|------------|-----------|-----|------------|-----------|-----|------------|-----------|-----|------------|-----------|-----|
| 1      | 39  | 59        | 21.7| 1          | IB        | high | yes        | yes       | yes| 2          | 83        | NA    | 50         | yes       | 4   | 3          | 41        | 130 | 46.1       | premenopausal| IB  | low        | yes       | no |
| 2      | 76  | 83        | 32.4| 1          | IA        | low  | yes        | no        | no |
| 3      | 53  | 79        | 28.3| 1          | IA        | low  | no         | no        | no |
| 4      | 60  | 68        | 25.0| 1          | IB        | low  | yes        | yes       | yes| 5          | 64        | 63    | 26.2       | 50         | IV   | low        | yes       | no |
| 6      | 73  | 95        | 34.1| 1          | IB        | low  | yes        | no        | no |
| 7      | 69  | 83        | 31.6| 1          | IA        | low  | yes        | no        | no |
| 8      | 79  | 84        | 32.8| 2          | IB        | low  | yes        | yes       | no |
| 9      | 74  | 75        | 28.5| 1          | IA        | low  | yes        | no        | no |
| 10     | 76  | 83        | 32.4| 1          | IA        | low  | yes        | no        | no |
| 11     | 53  | 70        | 27.3| 3          | premenopausal| 3   | IA        | low        | no | 12         | 36        | 92    | 33.8       | premenopausal| 2    | IA        | low        | no | 13         | 45        | 55    | 20.0       | premenopausal| 1    | IA        | low        | no | 14         | 69        | 68    | 25.3       | IB        | low  | yes        | yes       | yes | 15         | 54        | 65    | 23.0       | premenopausal| 0    | IA        | high       | NA | 16         | 72        | 100   | 35.9       | IA        | low  | NA         | no        | no | 17         | 54        | 51    | 19.9       | premenopausal| 2    | IA        | low        | no | 18         | 69        | 82    | 30.1       | 65         | 0   | IB        | high       | yes | 19         | 77        | 85    | NA         | 50         | 1   | IB        | high       | yes | 20         | 57        | 104   | 38.2       | 56         | 2   | IA        | low        | no | 21         | 61        | 88    | 30.8       | 50         | 2   | IA        | low        | no | 22         | 78        | 69    | NA         | 50         | 2   | IA        | low        | yes | 23         | 63        | 75    | 31.6       | 55         | 3   | IA        | low        | yes | 24         | 71        | 80    | 29.4       | 59         | 2   | IA        | high       | yes | 25         | 81        | 82    | 28.4       | 51         | 2   | IA        | low        | NA | 26         | 73        | 65    | 24.8       | 48         | 0   | IB        | high       | yes | 27         | 50        | 88    | 32.3       | premenopausal| 1   | IIIA       | low        | yes | 28         | 29        | 57    | 20.0       | premenopausal| 0   | IA        | high       | yes | 29         | 59        | 60    | 19.4       | 40         | 2   | IB        | high       | yes | 30         | 70        | 119   | 47.7       | 50         | 1   | IA        | low        | yes | 31         | 61        | 88    | 30.8       | 50         | 2   | IA        | low        | no | 32         | 78        | 69    | NA         | 50         | 2   | IA        | low        | yes | 33         | 63        | 75    | 30.4       | 55         | 3   | IA        | low        | yes | 34         | 75        | 130   | 48.9       | 50         | 3   | IA        | low        | yes | 35         | 50        | 86    | NA         | NA         | 1   | IA        | high       | yes | 36         | 71        | 100   | 41.1       | 54         | 4   | IA        | low        | yes | 37         | 75        | 60    | 24.0       | 50         | 1   | IIIC1      | high       | yes | 38         | 55        | 95    | 38.1       | 54         | 4   | IA        | low        | no | 39         | 43        | 110   | 44.6       | premenopausal| 2   | IA        | low        | no | 40         | 68        | 87    | 34.9       | 53         | 2   | IA        | low        | yes | 41         | 83        | 90    | 33.1       | 55         | 2   | IA        | low        | no | 42         | 59        | 102   | 37.5       | 52         | 1   | IA        | low        | no | 43         | 66        | 93    | 34.6       | 57         | 1   | IA        | low        | yes | 44         | 66        | 67    | 25.5       | 52         | 2   | IA        | low        | yes | 45         | 80        | 59    | 28.1       | 50         | 1   | IB        | high       | yes | 46         | 72        | 67    | 27.5       | 50         | 3   | IA        | low        | yes | 47         | 44        | 79    | 29.0       | premenopausal| 2   | IA        | low        | no | 48         | 45        | 60    | 20.8       | premenopausal| 2   | II        | low        | yes | 49         | 72        | 80    | 29.4       | 58         | 2   | IA        | low        | yes | 50         | 55        | 97    | NA         | 58         | 2   | IB        | high       | yes | 51         | 48        | 94    | NA         | premenopausal| 2   | IA        | high       | yes |

NA, not available.
Table 2
Correlations between expression of genes involved in estrogen biosynthesis and action and demographic characteristics of endometrial cancer patients.

| Gene     | Age | Body mass | BMI | Age at menopause | Parity |
|----------|-----|-----------|-----|------------------|--------|
|          | Rho | p        | Adj.p | N   | Rho | p | Adj.p | N   | Rho | p | Adj.p | N   | Rho | p | Adj.p | N   |
| AKR1C3   | -0.159 | 0.459 | 1.000 | 24 | -0.029 | 0.895 | 0.895 | 23 | -0.012 | 0.960 | 1.000 | 21 | 0.231 | 0.356 | 0.949 | 18 |
| CYP19A1  | -0.110 | 0.610 | 0.976 | 24 | -0.108 | 0.623 | 0.906 | 23 | -0.010 | 0.964 | 1.000 | 21 | -0.032 | 0.899 | 1.000 | 18 |
| HSD17B2  | 0.355 | 0.017 | 0.272 | 45 | 0.173 | 0.262 | 1.000 | 44 | 0.209 | 0.190 | 1.000 | 41 | -0.360 | 0.043 | 0.688 | 32 |
| HSD17B1  | 0.000 | 0.998 | 0.998 | 29 | -0.116 | 0.558 | 1.000 | 28 | -0.179 | 0.381 | 1.000 | 26 | 0.107 | 0.652 | 0.869 | 20 |
| HSD17B4  | -0.097 | 0.654 | 0.872 | 24 | -0.056 | 0.800 | 0.853 | 23 | 0.086 | 0.712 | 1.000 | 21 | 0.138 | 0.585 | 0.851 | 18 |
| HSD17B8  | 0.018 | 0.934 | 1.000 | 24 | -0.122 | 0.579 | 1.000 | 23 | -0.203 | 0.378 | 1.000 | 21 | 0.028 | 0.913 | 1.000 | 18 |
| HSD17B14 | -0.150 | 0.495 | 1.000 | 23 | 0.192 | 0.393 | 1.000 | 22 | 0.238 | 0.313 | 1.000 | 20 | 0.173 | 0.507 | 0.811 | 17 |
| HSD17B12 | 0.115 | 0.593 | 1.000 | 24 | 0.090 | 0.683 | 0.911 | 23 | -0.001 | 0.996 | 0.996 | 21 | -0.278 | 0.264 | 1.000 | 18 |
| SULT1E1  | 0.192 | 0.255 | 1.000 | 37 | 0.127 | 0.461 | 1.000 | 36 | 0.122 | 0.499 | 1.000 | 33 | -0.213 | 0.285 | 0.912 | 27 |
| STS      | 0.109 | 0.573 | 1.000 | 29 | 0.063 | 0.751 | 0.858 | 28 | 0.062 | 0.763 | 1.000 | 26 | 0.171 | 0.472 | 0.839 | 20 |
| SULT2A1  | -0.101 | 0.553 | 1.000 | 37 | -0.088 | 0.610 | 0.976 | 36 | -0.077 | 0.669 | 1.000 | 33 | 0.019 | 0.926 | 0.988 | 27 |
| SULT2B1  | -0.012 | 0.946 | 1.000 | 37 | 0.201 | 0.239 | 1.000 | 36 | 0.198 | 0.270 | 1.000 | 33 | 0.016 | 0.937 | 0.937 | 27 |
| ESR1     | -0.355 | 0.021 | 0.168 | 42 | -0.062 | 0.700 | 0.862 | 41 | -0.090 | 0.592 | 1.000 | 38 | -0.364 | 0.048 | 0.384 | 30 |
| ESR2     | 0.088 | 0.643 | 0.935 | 30 | -0.361 | 0.054 | 0.864 | 29 | -0.254 | 0.201 | 1.000 | 27 | 0.201 | 0.383 | 0.875 | 21 |
| GPER2    | 0.116 | 0.540 | 1.000 | 30 | -0.156 | 0.420 | 1.000 | 29 | -0.049 | 0.810 | 0.997 | 27 | 0.290 | 0.202 | 1.000 | 21 |

Spearman’s rho correlation coefficient (Rho) and 2-tailed significance (p) and adjusted significance (Adj. p) and N number of endometrial cancer cases are shown.

* Correlation is significant at the 0.05 level (2-tailed).
| Gene   | Age   | Rho     | p     | Adj. p | N  | Body mass | Rho    | p     | Adj. p | N  | BMI     | Rho    | p     | Adj. p | N  | Age at menopause | Rho    | p     | Adj. p | N  | Parity | Rho    | p     | Adj. p | N  |
|--------|-------|---------|-------|--------|----|-----------|--------|-------|--------|----|---------|--------|-------|--------|----|----------------|--------|-------|--------|----|--------|--------|-------|--------|----|
| SULT1E1 | 0.192 | 0.255   | 0.850 | 37    | 0.127 | 0.461   | 0.922 | 36    | 0.122 | 0.499 | 0.998 | 33 | -0.213  | 0.285 | 0.950 | 27 | 0.016 | 0.925 | 1.000 | 36 |
| CYP1A1  | 0.287 | 0.085   | 0.850 | 37    | -0.029 | 0.866   | 0.962 | 36    | -0.045 | 0.803 | 1.000 | 33 | 0.003  | 0.989 | 0.989 | 27 | -0.086 | 0.619 | 0.884 | 36 |
| CYP1B1  | 0.021 | 0.900   | 0.900 | 37    | -0.090 | 0.602   | 0.860 | 36    | -0.027 | 0.881 | 0.881 | 33 | 0.040  | 0.844 | 1.000 | 27 | -0.033 | 0.847 | 1.000 | 36 |
| CYP1A2  | 0.238 | 0.157   | 0.785 | 37    | -0.144 | 0.402   | 1.000 | 36    | -0.119 | 0.508 | 0.847 | 33 | 0.048  | 0.811 | 1.000 | 27 | 0.173  | 0.312 | 1.000 | 36 |
| CYP3A5  | 0.028 | 0.869   | 0.966 | 37    | -0.130 | 0.450   | 1.000 | 36    | -0.155 | 0.388 | 1.000 | 33 | 0.102  | 0.612 | 1.000 | 27 | -0.129 | 0.453 | 0.906 | 36 |
| CYP3A7  | -0.157 | 0.333   | 0.883 | 37    | -0.252 | 0.139   | 1.000 | 36    | -0.218 | 0.222 | 1.000 | 33 | -0.008 | 0.970 | 1.000 | 27 | -0.231 | 0.175 | 0.875 | 36 |
| COMT    | -0.135 | 0.426   | 0.852 | 37    | 0.005  | 0.977   | 0.977 | 36    | -0.029 | 0.874 | 0.971 | 33 | 0.209  | 0.295 | 0.738 | 27 | -0.288 | 0.089 | 0.890 | 36 |
| UGT2B7  | 0.117  | 0.490   | 0.817 | 37    | 0.047  | 0.786   | 0.983 | 36    | 0.032  | 0.859 | 1.000 | 33 | 0.318  | 0.106 | 0.530 | 27 | 0.008  | 0.963 | 0.963 | 36 |
| SULT1A1 | -0.051 | 0.765   | 0.956 | 35    | -0.218 | 0.201   | 1.000 | 36    | -0.205 | 0.253 | 1.000 | 33 | 0.059  | 0.771 | 1.000 | 27 | -0.167 | 0.330 | 0.825 | 36 |
| GSTP1   | -0.071 | 0.684   | 0.977 | 35    | 0.109  | 0.538   | 0.897 | 34    | 0.140  | 0.453 | 1.000 | 31 | 0.511  | 0.008 | 0.080 | 26 | 0.118  | 0.507 | 0.845 | 34 |

Spearman’s rho correlation coefficient (Rho) and 2-tailed significance (p) and adjusted significance (Adj. p) and N number of endometrial cancer cases are shown. ** Correlation is significant at the 0.001 level (2-tailed).
Table 4
Correlations between expression of genes involved in progesterone biosynthesis and action and demographic characteristics of endometrial cancer patients.

| Gene | Age | Body mass | BMI | Age at menopause | Parity |
|------|-----|-----------|-----|------------------|--------|
|      | Rho | p         | N   | Rho              | Adj. p | N   | Rho | Adj. p | N   | Rho | Adj. p | N   | Rho | Adj. p | N   | Rho | Adj. p | N   |
| PGR  | -0.089 | 0.563 | 0.845 | 45 | 0.081 | 0.603 | 1.000 | 44 | 0.016 | 0.920 | 0.920 | 41 | -0.076 | 0.680 | 0.874 | 32 | 0.182 | 0.238 | 0.536 | 44 |
| PAQR7 | -0.455* | 0.002 | 0.018 | 45 | -0.019 | 0.903 | 0.903 | 44 | -0.113 | 0.482 | 1.000 | 41 | 0.277 | 0.125 | 0.563 | 32 | 0.220 | 0.150 | 0.675 | 44 |
| PAQR5 | -0.034 | 0.826 | 0.826 | 45 | -0.226 | 0.140 | 0.630 | 44 | -0.172 | 0.282 | 1.000 | 41 | 0.049 | 0.791 | 0.890 | 32 | 0.124 | 0.422 | 0.633 | 44 |
| PAQR8 | -0.137 | 0.382 | 0.860 | 43 | -0.072 | 0.653 | 1.000 | 42 | -0.076 | 0.646 | 1.000 | 39 | -0.436* | 0.014 | 0.126 | 31 | -0.104 | 0.514 | 0.661 | 42 |
| PRB  | 0.070 | 0.649 | 0.834 | 45 | 0.072 | 0.640 | 1.000 | 44 | 0.066 | 0.683 | 1.000 | 41 | -0.128 | 0.485 | 0.728 | 32 | 0.248 | 0.105 | 0.945 | 44 |
| STAR | -0.194 | 0.202 | 0.606 | 45 | 0.358* | 0.017 | 0.153 | 44 | 0.374* | 0.016 | 0.144 | 41 | 0.226 | 0.213 | 0.479 | 32 | 0.207 | 0.178 | 0.534 | 44 |
| HSD3B1 | 0.115 | 0.491 | 0.884 | 38 | 0.021 | 0.902 | 1.000 | 37 | -0.048 | 0.787 | 1.000 | 34 | 0.008 | 0.967 | 0.967 | 29 | 0.055 | 0.748 | 0.842 | 37 |
| HSD3B2 | -0.065 | 0.700 | 0.788 | 37 | 0.075 | 0.665 | 0.998 | 36 | 0.044 | 0.809 | 0.910 | 33 | -0.194 | 0.333 | 0.599 | 27 | -0.014 | 0.935 | 0.935 | 36 |
| CYP11A1 | -0.243 | 0.108 | 0.486 | 45 | -0.050 | 0.747 | 0.960 | 44 | -0.139 | 0.387 | 1.000 | 41 | 0.251 | 0.166 | 0.498 | 32 | 0.155 | 0.315 | 0.567 | 44 |

Spearman’s rho correlation coefficient (Rho) and 2-tailed significance (p) and adjusted significance (Adj. p) and N number of endometrial cancer cases are shown. * Correlation is significant at the 0.05 level (2-tailed).
Table 5
Correlations between expression of genes involved in progesterone metabolism and demographic characteristics of endometrial cancer patients.

| Gene    | Age | Age at menopause | Parity |
|---------|-----|------------------|--------|
|         | Rho | p                | Adj. p | N  | Rho | p | Adj. p | N  | Rho | p | Adj. p | N  | Rho | p | Adj. p | N  |
| SRD5A1  | -0.212 | 0.270 | 0.540 | 29 | -0.531** | 0.004 | 0.024 | 28 | -0.533** | 0.005 | 0.030 | 26 | -0.218 | 0.356 | 0.534 | 20 | -0.382* | 0.045 | 0.135 | 28 |
| SRD5A2  | 0.439* | 0.017 | 0.102 | 29 | -0.189 | 0.336 | 0.672 | 28 | -0.085 | 0.678 | 1.000 | 26 | -0.037 | 0.876 | 0.876 | 20 | 0.241 | 0.217 | 0.326 | 28 |
| AKR1C1  | -0.028 | 0.854 | 0.854 | 45 | 0.010 | 0.950 | 1.000 | 44 | -0.048 | 0.764 | 0.917 | 41 | 0.298 | 0.097 | 0.291 | 32 | -0.088 | 0.568 | 0.568 | 44 |
| AKR1C2  | 0.036 | 0.817 | 0.980 | 45 | 0.003 | 0.986 | 0.986 | 44 | -0.080 | 0.620 | 1.000 | 41 | 0.297 | 0.099 | 0.198 | 32 | -0.156 | 0.313 | 0.376 | 44 |
| AKR1C3  | -0.159 | 0.459 | 0.689 | 24 | -0.029 | 0.895 | 1.000 | 23 | -0.012 | 0.960 | 0.960 | 21 | 0.231 | 0.356 | 0.427 | 18 | -0.473* | 0.022 | 0.132 | 23 |
| HSD17B2 | 0.017 | 0.051 | 45   | 0.173 | 0.262 | 0.786 | 44 | 0.209 | 0.190 | 0.570 | 41 | - | 0.043 | 0.258 | 32 | 0.245 | 0.109 | 0.218 | 44 |

Spearman’s rho correlation coefficient (Rho) and 2-tailed significance (p) and adjusted significance (Adj. p) and N number of endometrial cancer cases are shown. * Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.001 level (2-tailed).
Table 6
Correlations between expression of genes involved in PGF2α biosynthesis and retinoic acid metabolism and demographic characteristics of endometrial cancer patients.

| Gene   | Age | Body mass | BMI | Age at menopause | Parity |
|--------|-----|-----------|-----|------------------|--------|
|        | Rho | P         | Adj. p | N     | Rho | p     | Adj. p | N | Rho | p | Adj. p | N | Rho | p | Adj. p | N |
| AKR1B1 | -0.278 | 0.064 | 0.192 | 45 | -0.357* | 0.017 | 0.026 | 44 | -0.332* | 0.034 | 0.051 | 41 | -0.227 | 0.211 | 0.633 | 32 | -0.106 | 0.495 | 0.495 | 44 |
| AKR1B10 | 0.036 | 0.815 | 0.815 | 45 | 0.481** | 0.001 | 0.003 | 44 | 0.516** | 0.001 | 0.003 | 41 | 0.046 | 0.804 | 0.804 | 32 | 0.249 | 0.103 | 0.155 | 44 |
| AKR1C3 | -0.159 | 0.459 | 0.689 | 24 | -0.029 | 0.895 | 0.895 | 23 | -0.012 | 0.960 | 0.960 | 21 | 0.231 | 0.356 | 0.534 | 18 | -0.473* | 0.022 | 0.066 | 23 |

Spearman’s rho correlation coefficient (Rho) and 2-tailed significance (p) and adjusted significance (Adj. p) and N number of endometrial cancer cases are shown.

* Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.001 level (2-tailed).
Forty-six (92.0%) of the 50 patients with the relevant data had at least one full-term pregnancy, four (8.0%) had none. Information for menopausal status was also available for 50 patients, with 38 (76.0%) post-menopausal and 12 (24.0%) pre-menopausal. The minimum age at the last menstruation

| Histological grade (high grade vs. low grade) | FIGO stage (IA vs. IB-IV) | Menopausal status | Myometrial invasion (yes/no) | Myometrial invasion > 1/2 (yes/no) | Lymphovascular invasion invasion (yes/no) |
|-----------------------------------------------|---------------------------|-------------------|-----------------------------|-----------------------------------|----------------------------------------|
| AKR1C3                                        | 0.825 0.880 0.306         | 0.424 0.754       | 0.555                       | 0.100                             | 0.804 0.99                             |
| CYP19A1                                       | 0.712 0.876 0.219         | 0.011 0.176       | 0.883                       | 0.068                             | 0.680 0.989                            |
| HSD17B2                                       | 0.010 0.160 0.251         | 0.028 0.224       | 0.939                       | 0.199                             | 0.961 0.961                            |
| HSD17B1                                       | 0.019 0.101 0.288         | 0.741 0.847       | 0.060                       | 0.690                             | 0.075 0.600                            |
| HSD17B4                                       | 0.010 0.080 0.785         | 1                 | 0.057                       | 0.584                             | 0.364 0.582                            |
| HSD17B8                                       | 0.507 0.676 0.891         | 0.317 0.845       | 0.338                       | 0.273                             | 0.117 0.624                            |
| HSD17B14                                      | 0.276 0.552 0.885         | 0.674 0.899       | 0.563                       | 0.430                             | 0.359 0.718                            |
| HSD17B12                                      | 0.210 0.480 0.946         | 0.463 0.741       | 0.606                       | 0.273                             | 0.215 0.491                            |
| SULT1E1                                       | 0.072 0.230 0.060         | 0.321 0.734       | 0.761                       | 0.313                             | 0.177 0.566                            |
| SULT2A1                                       | 0.805 0.920 0.591         | 0.706 0.869       | 0.580                       | 0.084                             | 0.912 1                                |
| SULT2B1                                       | 0.044 0.176 0.737         | 0.132 0.528       | 0.493                       | 0.495                             | 0.361 0.642                            |
| ESRI                                          | 0.910 0.901 0.831         | 0.330 0.66        | 0.182                       | 0.454                             | 0.210 0.560                            |
| ES2                                           | 0.333 0.592 0.738         | 0.113 0.603       | 0.739                       | 0.255                             | 0.150 0.600                            |
| GPER2                                         | 0.446 0.714 0.799         | 0.483 0.703       | 0.919                       | 0.288                             | 0.915 0.976                            |
| GPER34                                        | 0.186 0.496 1             | 0.268 0.858       | 0.416                       | 0.507                             | 0.71 0.947                             |

Changes in gene expression ratios were tested using Mann-Whitney nonparametric tests for two-group comparisons, and Wilcoxon nonparametric W tests. Corrections for multiple testing were performed according to Benjamini and Hochberg [7]. Asymptotic 2-tailed significance (p) and adjusted significance (Adj. p) are shown. Adj. p was calculated only in the groups where p < 0.05.

| Histological grade (high grade vs. low grade) | FIGO stage (IA vs. IB-IV) | Menopausal status | Myometrial invasion (yes/no) | Myometrial invasion > 1/2 (yes/no) | Lymphovascular invasion invasion (yes/no) |
|-----------------------------------------------|---------------------------|-------------------|-----------------------------|-----------------------------------|----------------------------------------|
| SULT1E1                                       | 0.072                     | 0.060             | 0.321                       | 0.761                             | 0.313                                  | 0.177                                  |
| CYP1A1                                         | 0.548                     | 0.737             | 0.682                       | 0.087                             | 0.126                                  | 0.290                                  |
| CYP1B1                                         | 0.525                     | 0.568             | 0.973                       | 0.068                             | 0.143                                  | 0.290                                  |
| CYP1A2                                         | 0.698                     | 0.591             | 0.412                       | 0.732                             | 0.313                                  | 0.511                                  |
| CYP2A5                                         | 0.572                     | 0.402             | 0.132                       | 0.594                             | 0.255                                  | 0.688                                  |
| CYP2A7                                         | 0.888                     | 0.481             | 0.918                       | 0.594                             | 0.626                                  | 0.798                                  |
| COMT                                           | 0.672                     | 0.840             | 0.945                       | 0.424                             | 0.097                                  | 0.535                                  |
| UGT2B7                                         | 0.916                     | 0.149             | 0.171                       | 0.568                             | 0.922                                  | 0.539                                  |
| SULT1A1                                       | 0.097                     | 0.920             | 0.206                       | 0.381                             | 0.922                                  | 0.342                                  |
| GSTP1                                         | 0.720                     | 0.094             | 0.806                       | 0.512                             | 0.476                                  | 0.147                                  |

Changes in expression were tested using Mann-Whitney nonparametric tests for two-group comparisons, and Wilcoxon nonparametric W tests. Corrections for multiple testing were performed according to Benjamini and Hochberg [7]. Asymptotic 2-tailed significance (p) is shown.

M. Sinreih et al. / Data in Brief 12 (2017) 632–643
Table 9
Changes in expression of genes involved in progesterone biosynthesis and action according to histopathological and clinical characteristics of endometrial cancer patients.

|             | Histological grade (high grade vs. low grade) | FIGO stage (IA vs. IB-IV) | Menopausal status | Myometrial invasion (yes/no) | Myometrial invasion > 1/2 (yes/no) | Lymphovascular invasion (yes/no) |
|-------------|-----------------------------------------------|----------------------------|-------------------|-------------------------------|-----------------------------------|----------------------------------|
|             | p     | Adj.p | p     | p     | Adj.p | p     | p     | Adj.p | p     | Adj.p |
| PGR         | 0.070 | 0.210 | 0.337 | 0.707 | 1     | 0.939 | 0.268 | 0.402 | 0.710 |
| PAQR7       | 0.191 | 0.430 | 0.165 | 0.054 | 0.243 | 0.417 | 0.010 | 0.09  | 0.859 |
| PAQR5       | 0.889 | 1     | 0.729 | 0.900 | 1     | 0.613 | 0.180 | 0.324 | 0.102 |
| PAQR8       | 0.479 | 0.719 | 0.718 | 0.176 | 0.528 | 0.859 | 0.054 | 0.122 | 0.363 |
| PRB         | 0.026 | 0.0117| 0.539 | 0.802 | 1     | 0.530 | 0.521 | 0.586 | 0.616 |
| STAR        | 0.001 | 0.009 | 0.078 | 0.900 | 0.9   | 0.702 | 0.041 | 0.123 | 0.409 |
| HSD3B1      | 0.904 | 0.904 | 0.118 | 0.693 | 1     | 0.252 | 0.626 | 0.626 | 0.224 |
| HSD3B2      | 0.437 | 0.787 | 0.202 | 0.393 | 0.884 | 0.704 | 0.454 | 0.584 | 0.742 |
| CYP11A1     | 0.738 | 0.949 | 0.157 | 0.028 | 0.252 | 0.657 | 0.036 | 0.162 | 0.528 |

Changes in expression were tested using Mann-Whitney nonparametric tests for two-group comparisons, and Wilcoxon nonparametric W tests. Corrections for multiple testing were performed according to Benjamini and Hochberg [7]. Asymptotic 2-tailed significance (p) and adjusted significance (Adj.p) are shown. Adj. p was calculated only in the groups where p < 0.05.

Table 10
Changes in expression of genes involved in progesterone metabolism according to histopathological and clinical characteristics of endometrial cancer patients.

|             | Histological grade (high grade vs. low grade) | FIGO stage (IA vs. IB-IV) | Menopausal status | Myometrial invasion (yes/no) | Myometrial invasion > 1/2 (yes/no) | Lymphovascular invasion (yes/no) |
|-------------|-----------------------------------------------|----------------------------|-------------------|-------------------------------|-----------------------------------|----------------------------------|
|             | p     | Adj.p | p     | p     | Adj.p | p     | p     | Adj.p | p     | Adj.p |
| SRD5A1      | 0.222 | 0.444 | 0.137 | 0.109 | 0.218 | 0.472 | 0.507 | 0.507 | 0.541 |
| SRD5A2      | 0.056 | 0.168 | 0.367 | 0.693 | 1     | 0.252 | 0.352 | 0.422 | 0.739 |
| AKR1C1      | 0.486 | 0.729 | 0.122 | 0.920 | 0.920 | 0.842 | 0.939 | 0.939 | 0.469 |
| AKR1C2      | 0.522 | 0.626 | 0.088 | 0.531 | 0.637 | 0.842 | 0.199 | 0.299 | 0.961 |
| AKR1C3      | 0.825 | 0.825 | 0.306 | 0.424 | 0.636 | 0.555 | 0.100 | 0.200 | 0.804 |
| HSD17B2     | 0.010 | 0.060 | 0.251 | 0.028 | 0.168 | 0.939 | 0.036 | 0.162 | 0.528 |

Changes in expression were tested using Mann-Whitney nonparametric tests for two-group comparisons, and Wilcoxon nonparametric W tests. Corrections for multiple testing were performed according to Benjamini and Hochberg [7]. Asymptotic 2-tailed significance (p) and adjusted significance (Adj.p) are shown. Adj. p was calculated only in the groups where p < 0.05.

Table 11
Changes in expression of genes involved in PGF2α biosynthesis and retinoic acid metabolism according to histopathological and clinical characteristics of endometrial cancer patients.

|             | Histological grade (high grade vs. low grade) | FIGO stage (IA vs. IB-IV) | Menopausal status | Myometrial invasion (yes/no) | Myometrial invasion > 1/2 (yes/no) | Lymphovascular invasion (yes/no) |
|-------------|-----------------------------------------------|----------------------------|-------------------|-------------------------------|-----------------------------------|----------------------------------|
|             | p     | Adj.p | p     | p     | Adj.p | p     | p     | Adj.p | p     | Adj.p |
| AKR1B1      | 0.070 | 0.105 | 0.729 | 0.026 | 0.078 | 0.842 | 0.521 | 0.373 | 0.56  |
| AKR1B10     | 0.001 | 0.003 | 0.055 | 0.075 | 0.113 | 0.083 | 0.08  | 0.037 | 0.111 |
| AKR1C2      | 0.825 | 0.825 | 0.306 | 0.424 | 0.424 | 0.555 | 0.1    | 0.804 | 0.804 |

Changes in expression were tested using Mann-Whitney nonparametric tests for two-group comparisons, and Wilcoxon nonparametric W tests. Corrections for multiple testing were performed according to Benjamini and Hochberg [7]. Asymptotic 2-tailed significance (p) and adjusted significance (Adj. p) are shown. Adj. p was calculated only in the groups where p < 0.05.
was 40 years, and the maximum was 65 years, with the mean of 52.34 years (SD, 4.54 years). The longest post-menopausal time before analysis was 33.6 years.

The Cancer Registry of the Republic of Slovenia was searched for the vital status of these 51 patients. The cut-off point was June 20, 2016, at which date 36 (70.6%) of these patients were still alive, and 15 (29.4%) were dead. The mean age at death was 75.36 years (SD, 9.30 years), with the minimum age at death of 57.05 years, and maximum age of 86.44 years. Eight patients (15.7%) died of cancer: four (7.8%) of uterine cancer, one of ovarian cancer, one of kidney cancer, one of malignant melanoma of the skin, and one of glioblastoma (2.0%, for each). Three patients (5.9%) died of chronic ischemic heart disease, one of atherosclerotic arteries of the extremities, one of benign meningeal neoplasm, and one of infection and inflammatory reaction due to an internal joint prosthesis (2.0%, for each). Morbid obesity with alveolar hypoventilation resulted in the death of one of the patients (2.0%).

The most common histologic type was endometrioid adenocarcinoma, as seen for 41 of the 51 patients (80.4%), of these, 29 (70.7%) had tumor grade 1 (G1), eight (19.5%) grade 2 (G2), and five (12.2%) grade 3 (G3). Five (9.80%) of the 51 patients had serous carcinoma, one (2.0%) had mucinous carcinoma, one (2.0%) had carcinosarcoma, and three (5.9%) had dedifferentiated carcinoma. At histologic examination, the tumor tissue was limited to the endometrium in 12 (23.5%) of the 51 patients, invasion into the myometrium (< 50% of myometrial thickness) was seen in 25 (49.0%), and deep tumor invasion (> 50% of myometrial thickness) was seen in 14 (27.5%). For one patient (2.0%), the tumor tissue had spread to the adjacent tissue to the right fallopian tube, while histological examination revealed pelvic lymph node metastases for one patient (2.0%). According to the International Federation of Gynecology and Obstetrics (FIGO) staging, 33 (66.0%) were classified as stage IA, 11 (22.0%) as stage IB, one (2.0%) as stage II, two (4.0%) as stage III, one as stage IIIA, one as stage IIIC1, and one as stage IV (2.0%, for each).

2. Experimental design, materials and methods

2.1. Gene expression ratios in cancer versus adjacent control tissue

We investigated expression of genes encoding enzymes of estrogen biosynthesis [2] (Figure 1, [1]), enzymes of estrogen metabolism [3] (Figure 2, [1]), enzymes of progesterone synthesis and metabolism [4] (Figures 3 and 4, [1]) and enzymes of PGF2α synthesis and metabolism of retinoic acid [5] (Figure 5, [1]). We also investigated expression of nuclear estrogen and progesterone receptors ESR1, ESR2 [2,6], PGR, PRB [4], and membrane bound estrogen and progesterone receptors GPER, PAQR5, PAQR7 and PAQR8 (manuscript in preparation) (Figures 2 and 3, [1]). Our studies comprised from 22 to 47 patients. To provide information about up/down-regulation of these 38 genes in cancer versus adjacent control tissue we calculated ratios for gene expression in tumor/adjacent control tissue and these data were statistically analyzed.

2.2. Statistical analysis

The correlations between the ratios for expression of 38 genes in tumor/adjacent control tissue and demographic parameters were evaluated by calculating Spearman’s correlation coefficient rho (Tables 2–6). The statistical significant changes in the ratios for expression of 38 genes in tumor/adjacent control tissue with regard to histopathological and clinical characteristics were tested using the Mann-Whitney test and the Wilcoxon W test, followed by Benjamini and Hochberg corrections for multiple testing [7] (Tables 7–11).

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Transparency document. Supporting information

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References

[1] M. Sinreih, S. Štupar, L. Cemažar, I. Verdenik, S.G. Frkovič, Š. Smrkolj, T.L. Rižner, STAR and AKR1B10 are down-regulated in high-grade endometrial cancer, J. Steroid Biochem. Mol Biol. (2017), pii: S0960-0760(17)30050-X. doi: 10.1016/j.jsbmb.2017.02.015.
[2] T. Smuc, T.L. Rizner, Aberrant pre-receptor regulation of estrogen and progesterone action in endometrial cancer, Mol. Cell. Endocrinol. 301 (1-2) (2009) 74–82.
[3] N. Hevir, J. Sinkovec, T.L. Ržner, Disturbed expression of phase I and phase II estrogen-metabolizing enzymes in endometrial cancer: lower levels of CYP1B1 and increased expression of S-COMT, Mol. Cell. Endocrinol. 331 (1) (2011) 158–167.
[4] M. Sinreih, N. Hevir, T.L. Ržner, Altered expression of genes involved in progesterone biosynthesis, metabolism and action in endometrial cancer, Chem. Biol. Interact. 202 (1-3) (2013) 210–217.
[5] N. Hevir, J. Sinkovec, T. Lanišnik Rižner, Decreased levels of AKR1B1 and AKR1B10 in cancerous endometrium compared to adjacent non-cancerous tissue, Chem. Biol. Interact. 202 (1-3) (2013) 226–233.
[6] T. Smuc, R. Rupreht, J. Sinkovec, J. Adamski, T.L. Rżner, Expression analysis of estrogen-metabolizing enzymes in human endometrial cancer, Mol. Cell. Endocrinol. 248 (1-2) (2006) 114–117.
[7] B.Ya.H.Y. Controlling the false discovery rate: a practical and powerful approach to multiple testing, Wiley R. Stat. Soc. (1995) 289–300.