Supplementary information

PrP C Promotes Endometriosis Progression By Reprogramming
Cholesterol Metabolism And Estrogen Biosynthesis Of Endometrial
Stromal Cells Through PPARα Pathway

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Figure S1: Verification of the next RNA-Sequencing results. (A) Protein level of HMGCR decreased in eESC, when compared to nESC. (B) Expression levels of estrogen signaling pathway related genes were verified by qRT-PCR assay. (C) Expression of APOE, PPARA, FADS2, FAXDC2, CPT1A and TP53 were verified. Data was showed as mean ± SEM, Student's t-test, one-way analysis of variance (ANOVA) and Mann-Whitney test were used to make statistical analysis. *P<0.05, **P<0.01, ***P<0.001, ****P<0.0001.
| No. | Diagnosis       | Specimens | Age | Cycle Phase | Dysmenorrhea | rASRM | Assays used          |
|-----|----------------|-----------|-----|-------------|--------------|-------|----------------------|
| 1   | Ovarian EMs    | EEM, EESC | 31  | Proliferative | Yes          | III   | qRT-PCR, ELISA       |
| 2   | Ovarian EMs    | EEM, EESC | 25  | Secretory   | no           | IV    | qRT-PCR, ELISA       |
| 3   | Ovarian EMs    | EEM, EESC | 37  | Proliferative | no           | II    | qRT-PCR, ELISA       |
| 4   | Ovarian EMs    | EEM, EESC | 40  | Proliferative | no           | II    | qRT-PCR, ELISA       |
| 5   | Ovarian EMs    | EEM, EESC | 46  | Secretory   | no           | III   | qRT-PCR, ELISA       |
| 6   | Ovarian EMs    | EEM, EESC | 43  | Proliferative | no           | III   | qRT-PCR, ELISA       |
| 7   | Ovarian EMs    | EEM, EESC | 26  | Proliferative | Yes          | II    | qRT-PCR, ELISA       |
| 8   | Ovarian EMs    | EEM, EESC | 39  | Secretory   | no           | II    | qRT-PCR, ELISA       |
| 9   | Ovarian EMs    | EEM, EESC | 24  | Proliferative | Yes          | III   | qRT-PCR, ELISA       |
| 10  | Ovarian EMs    | EEM, EESC | 33  | Proliferative | Yes          | III   | qRT-PCR, WB, ELISA   |
| 11  | Ovarian EMs    | EEM, EESC | 39  | Proliferative | no           | III   | qRT-PCR, WB, ELISA   |
| 12  | Ovarian EMs    | EEM, EESC | 46  | Proliferative | no           | III   | qRT-PCR, WB, ELISA   |
| 13  | Ovarian EMs    | EEM, EESC | 29  | Proliferative | Yes          | III   | qRT-PCR, WB, ELISA   |
| 14  | Ovarian EMs    | EEM       | 40  | Proliferative | Yes          | III   | WB, IHC              |
| 15  | Ovarian EMs    | EEM       | 31  | Proliferative | Yes          | IV    | WB, IHC              |
| 16  | Ovarian EMs    | EEM       | 37  | Proliferative | no           | III   | WB, IHC              |
| 17  | Ovarian EMs    | EEM       | 39  | Proliferative | no           | III   | WB, IHC              |
| 18  | Ovarian EMs    | EEM       | 32  | Proliferative | no           | III   | WB, IHC              |
| 19  | Ovarian EMs    | EEM       | 27  | Proliferative | no           | III   | WB, IHC              |
| 20  | Ovarian EMs    | EEM       | 29  | Secretory   | no           | III   | WB, IHC              |
| 21  | Ovarian EMs    | EEM       | 43  | Proliferative | Yes          | IV    | WB, IHC              |
| 22  | Ovarian EMs    | EEM       | 31  | Proliferative | Yes          | III   | WB, IHC              |
| 23  | Ovarian EMs    | EEM       | 25  | Proliferative | Yes          | II    | WB, IHC              |
| 24  | Ovarian EMs    | EEM       | 30  | Proliferative | no           | III   | WB, IHC              |
| 25  | Ovarian EMs    | EEM       | 29  | Proliferative | Yes          | III   | WB, IHC              |
| 26  | Ovarian EMs    | EEM       | 34  | Proliferative | Yes          | II    | WB, IHC              |
| No. | Tissue Type      | Normal tissue | Proliferation | Tissue Type | Normal tissue | Proliferation | Staining Method       |
|-----|------------------|---------------|---------------|-------------|---------------|---------------|------------------------|
| 27  | Ovarian EMs      | EEM           | Proliferative | Yes         | II            | WB, IHC       |
| 28  | Ovarian EMs      | EEM           | Secretory     | Yes         | III           | WB, IHC       |
| 29  | Ovarian EMs      | EEM           | Proliferative | Yes         | III           | WB, IHC       |
| 30  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | qRT-PCR, ELISA, IHC |
| 31  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | qRT-PCR, ELISA, IHC |
| 32  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | qRT-PCR, ELISA, IHC |
| 33  | Tubal Infertility| NEM, NESC     | Secretory     | No          | -             | qRT-PCR, ELISA, IHC |
| 34  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | qRT-PCR, WB, ELISA |
| 35  | Tubal Infertility| NEM, NESC     | Proliferative | Yes         | -             | qRT-PCR, WB, ELISA |
| 36  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | qRT-PCR, WB, ELISA |
| 37  | Tubal Infertility| NEM, NESC     | Proliferative | Yes         | -             | qRT-PCR, WB, ELISA |
| 38  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | qRT-PCR, WB, ELISA |
| 39  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | qRT-PCR, WB, ELISA |
| 40  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | qRT-PCR, WB, ELISA |
| 41  | Tubal Infertility| NEM, NESC     | Proliferative | Yes         | -             | qRT-PCR, WB, ELISA |
| 42  | Tubal Infertility| NEM, NESC     | Secretory     | No          | -             | WB, ELISA, IHC |
| 43  | Tubal Infertility| NEM, NESC     | Proliferative | Yes         | -             | WB, ELISA, IHC |
| 44  | Tubal Infertility| NEM, NESC     | Proliferative | No          | -             | WB, ELISA, IHC |
| 45  | Tubal Infertility| NEM            | Proliferative | No          | -             | qRT-PCR, WB, IHC |
| 46  | Tubal Infertility| NEM            | Proliferative | No          | -             | qRT-PCR, WB, IHC |
| 47  | Tubal Infertility| NEM            | Proliferative | No          | -             | qRT-PCR, WB, IHC |
| 48  | Tubal Infertility| NEM            | Proliferative | No          | -             | qRT-PCR, WB, IHC |
| 49  | Tubal Infertility| NEM            | Proliferative | No          | -             | WB, IHC       |

**Note:**

No.: Number; EEM: ectopic endometrium; NEM: normal endometrium; EESC: ectopic endometrial stromal cells; NESC: normal endometrial stromal cells; qRT-PCR: quantitative real-time PCR assay; WB: western blotting assay; IHC: immunohistochemistry; ELISA: enzyme-linked immunosorbent assay.
| Gene Name      | Forward or Reverse | Sequence                          |
|----------------|--------------------|-----------------------------------|
| Human stAR     | Forward            | GGCATCCTTAGCAACCAAGA              |
| Human stAR     | Reverse            | TCTCCTTGACATTTGGGGGTT              |
| Human CYP17A1  | Forward            | TCTCTGGGCGGCGCTCAA                |
| Human CYP17A1  | Reverse            | AGGCGATACCCCTACGGTTGT              |
| Human CYP19A1  | Forward            | GACTTTGCCCAGTGAGTGTTT              |
| Human CYP19A1  | Reverse            | CGATCAGCATTTCCAATATGCA             |
| Human CYP11A1  | Forward            | GAGATGGCAGCGAACCCTGGAAG            |
| Human CYP11A1  | Reverse            | CTTAGTGTCCTGATGCTGGC              |
| Human HSD3B2   | Forward            | CAGGCTCTTTTCAGGAATGG              |
| Human HSD3B2   | Reverse            | CTTGGACAAGGCCTCCAGAC              |
| Human PGR      | Forward            | CCCAGCATGTCGCTTGAAGAA             |
| Human PGR      | Reverse            | AGTGCTTCTACAACCTCTGACTT           |
| Human B-Actin  | Forward            | TGCCACCCAGCACAAATGAA              |
| Human B-Actin  | Reverse            | CTAAGTCACTAGTCGCCCTAGAAGCA         |
| Human GAPDH    | Forward            | GCCTCAAGATCATGCAATGCT              |
| Human GAPDH    | Reverse            | GTGGTCACTGAGTCTTCCAGCAT            |
| Human HSD17B7  | Forward            | AAGGCAAGGAACCTTACAGCTCTT           |
| Human HSD17B7  | Reverse            | AATATTGCCGGCATCAACAGCGTC           |
| human PRNP     | Forward            | AATCAAGCAGCACACCGTCA              |
| human PRNP     | Reverse            | TCGGTGAAGTTTCTCCCCCTT             |
| Human ACAT2    | Forward            | GAGACTTACCTAGGACGCTC              |
| Human ACAT2    | Reverse            | AGTTCTTGGCCACATAATTCCAC           |
| Human HMGCS1   | Forward            | AAAGTACCAAGACTCCCCGTCCACA         |
| Human HMGCS1   | Reverse            | ATCCCCATTCTCCAACGTTCCTCA          |
| Human HMGCR    | Forward            | GCCTGCTCGAAACATCTGAA              |
| Human HMGCR    | Reverse            | CTGACCTGGAACCTGAAACCGATA          |
| Human SQLE     | Forward            | CTAAGCAGAGCCCAATGCAAAGT           |
| Gene          | Primer Direction | Sequence                  |
|--------------|------------------|---------------------------|
| Human SQLE   | Reverse          | ACAACAGTCAGTGAGCATGGAGT   |
| Human DHCR24 | Forward          | GTGAAACACTTTGAAGCCAGG     |
| Human DHCR24 | Reverse          | AGCCATCAAACATCTCCAG       |
| Human IDI1   | Forward          | GCATCGAGCTTTTAGTGCTTCT    |
| Human IDI1   | Reverse          | GGCTGGATTTGCTTAATGGATGA   |
| Human DHCR7  | Forward          | CAGCGCCAGAGACTGCAA        |
| Human DHCR7  | Reverse          | TGAAGAAACAGCTTTGAAGCTAAAAC |
| Human LSS    | Forward          | CATCAACATGCTTGCGCTGGTA    |
| Human LSS    | Reverse          | ATTTTCATGCGCTCAAGGCCCATC  |
| Human SREBP-1| Forward          | CCCATGGGAAGCCTGTACA       |
| Human SREBP-1| Reverse          | CTAAGAGATGTTCGCCGAATAGCT  |
| Human SREBP-2| Forward          | ACAACCCATAATATCTGAGAAACAG |
| Human SREBP-2| Reverse          | TTGTGCATCCTTGCGCTTCT      |
| Human CYP51  | Forward          | GAGTGATGCTGCGACTGTMTT    |
| Human CYP51  | Reverse          | ACATCGTATGCAACTCCCTTCCCA |
| Human ACAT1  | Forward          | GCAGCGAAAGGACTCAATG       |
| Human ACAT1  | Reverse          | GCAGCATACAGGAGCAATTGG     |
| Human ABCG2  | Forward          | TTTCAAGCGTCTATTTCAAAAA    |
| Human ABCG2  | Reverse          | TACGACTGTGCAATGATCTGAGC  |
| Human ABCA1  | Forward          | ATGTCCAGTCCAGTAATGTCTCTGT |
| Human ABCA1  | Reverse          | CGAGATATGCTCCGGATTCG     |
| Human APOE   | Forward          | TGCCCGGCCTTCTACTCCTTTC    |
| Human APOE   | Reverse          | GAGGTGAAGGAGCGTGGCGAGAG   |
| Human PPARA  | Forward          | GGCAGAGATTGTCCCTGGAAGC    |
| Human PPARA  | Reverse          | CACAGGATAAGTCACCAGAGG     |
| Human FADS2  | Forward          | TCATGACCATGATCGTCATAAGAA  |
| Human FADS2  | Reverse          | GCTCCAGGATGCCGTAGA        |
| Human FAXDC2 | Forward          | GACATGGATCGCTTGTAAGACT    |
| Human FAXDC2 | Reverse          | GAAAGATATCATGCGACTGGTGA   |
| Gene   | Orientation | Primer 1 | Primer 2 |
|--------|-------------|----------|----------|
| Human CPT1A | Forward      | ATCAATCGGACTCTGGAAACGG | TCAGGGAGTACGCCATGTT |
| Human CPT1A | Reverse     | CCTGATTGGCCAGACTGC       | TTTTCAGGAAAGTAGTTTCCATAGGT |
| Human TP53  | Forward      | AGAAGGATTCCTACCGGAAGCAGGT | TGCTCCCTGTACTGTTGGATGTT |
| Human TP53  | Reverse     | CCTCTCACGGGAGCAGATTAAGCAGA | CCCTGTCTGCTTTGGCCTAGGTT |
| Human HRAS  | Forward      | AGAGGATTCCTACCGGAAGCAGGT | TGCTCCCTGTACTGTTGGATGTT |
| Human HRAS  | Reverse     | CCTCTCACGGGAGCAGATTAAGCAGA | CCCTGTCTGCTTTGGCCTAGGTT |
| Human NRAS  | Forward      | AGAAGGATTCCTACCGGAAGCAGGT | TGCTCCCTGTACTGTTGGATGTT |
| Human NRAS  | Reverse     | CCTCTCACGGGAGCAGATTAAGCAGA | CCCTGTCTGCTTTGGCCTAGGTT |
| Human JUN   | Forward      | AGAAGGATTCCTACCGGAAGCAGGT | TGCTCCCTGTACTGTTGGATGTT |
| Human JUN   | Reverse     | CCTCTCACGGGAGCAGATTAAGCAGA | CCCTGTCTGCTTTGGCCTAGGTT |
| Human GNAI1 | Forward      | ACGGACACATCCATCATCCT      | TCCTGTCTGCTTTGGCCTAGGTT |
| Human GNAI1 | Reverse     | ACAAGGATCGGAATGGTTACAT    | CACCAACACAGTTTTGATGCCA |
| Human CALM1 | Forward      | ACAAGGATCGGAATGGTTACAT    | CACCAACACAGTTTTGATGCCA |
| Human CALM1 | Reverse     | ACAAGGATCGGAATGGTTACAT    | CACCAACACAGTTTTGATGCCA |
| Human HSPA8 | Forward      | GCAGGATCACCCCTCTGAGTGCAG  | GATGACACGCCTTTCTTCTGTC |
| Human HSPA8 | Reverse     | GCAGGATCACCCCTCTGAGTGCAG  | GATGACACGCCTTTCTTCTGTC |
| Human PIK3R3| Forward      | TACAATACGGTGTGGAGTATGGA   | TACAATACGGTGTGGAGTATGGA |
| Human PIK3R3| Reverse     | TACAATACGGTGTGGAGTATGGA   | TACAATACGGTGTGGAGTATGGA |
| Human SOS1  | Forward      | GCAGGATCACCCCTCTGAGTGCAG  | GATGACACGCCTTTCTTCTGTC |
| Human SOS1  | Reverse     | GCAGGATCACCCCTCTGAGTGCAG  | GATGACACGCCTTTCTTCTGTC |
| Human KRT10 | Forward      | GCAGGATCACCCCTCTGAGTGCAG  | GATGACACGCCTTTCTTCTGTC |
| Human KRT10 | Reverse     | GCAGGATCACCCCTCTGAGTGCAG  | GATGACACGCCTTTCTTCTGTC |
| Human KRT14 | Forward      | GGCCTGCTGAGATCAGAAGCAGA   | GGCCTGCTGAGATCAGAAGCAGA |
| Human KRT14 | Reverse     | GGCCTGCTGAGATCAGAAGCAGA   | GGCCTGCTGAGATCAGAAGCAGA |
| Human KRT18 | Forward      | GGCCTGCTGAGATCAGAAGCAGA   | GGCCTGCTGAGATCAGAAGCAGA |
| Human KRT18 | Reverse     | GGCCTGCTGAGATCAGAAGCAGA   | GGCCTGCTGAGATCAGAAGCAGA |
### Table S3: Reagents used in this study.

| Reagent                                           | Application | Manufacturer | Catalogue   |
|---------------------------------------------------|-------------|--------------|-------------|
| Anti-prion                                        | WB/IHC      | Abcam        | ab52604     |
| Anti-HMGCR                                        | WB          | abcam        | Ab174830    |
| Anti-ABCA1                                        | WB          | abcam        | Ab18180     |
| Anti-CYP19A1 (Aromatase)                         | WB          | CST          | 14528       |
| Anti-CYP17A1                                      | WB          | abcam        | Ab125022    |
| Anti-CYP11A1                                      | WB          | abcam        | Ab175408    |
| Anti-PCNA                                         | WB          | CST          | 13110       |
| Anti-PPARα                                        | WB          | abcam        | Ab215270    |
| Anti-GAPDH                                        | WB          | CST          | 5174S       |
| Anti-Actin                                        | WB          | CST          | 4970        |
| PE anti-human CD230 (Prion)                      | FCM         | Biolegend    | 800318      |
| DAB HRP Color Development Kit                     | IHC         | Biotech Well | WB0167      |
| RIPA                                              | WB          | Biotech Well | WB0101      |
| 4% Paraformaldehyde                               | Reagent     | Biotech Well | WH1011      |
| PVDF membrane                                     | WB          | Millipore    | IPVH00010   |
| CELLSAVING                                        | Cell Culture| NCM          | C40050      |
| Pravastatin                                       | Reagent     | MedChemExpress| HY-B0165A  |
| Gemfibrozil                                       | Reagent     | MedChemExpress| HY-B0258  |
| 17-β estradiol                                    | Reagent     | Sigma        | E2758       |
| PrimeScript RT Master Mix                         | qRT-PCR     | Takara       | RR036A      |
| TB Green Premix Ex TaqTMII                        | qRT-PCR     | Takara       | RR820A      |
| RNAsiso Plus                                      | qRT-PCR     | Takara       | 9109        |
| 17-β estradiol ELISA Kit                          | ELISA       | IBL          | RE52041     |
| Amplex Red Cholesterol Assay Kit                  | Reagent     | Invitrogen   | A12216      |
| Cholesterol Assay Kit (Cell-Based)                | Reagent     | abcam        | Ab133116    |
| U18666A                                           | Reagent     | abcam        | Ab133116    |
| Immobilon Western Chemilum HRP                    | WB          | Millipore    | WBKLS0100   |
| Product            | Reagent | Manufacturer | Code   |
|--------------------|---------|--------------|--------|
| Cell Counting Kit-8| Reagent | DOJINDO      | CK04   |
| Matrigel           | Reagent | Corning      | 356234 |
| DMSO               | Reagent | Sigma        | D8418  |