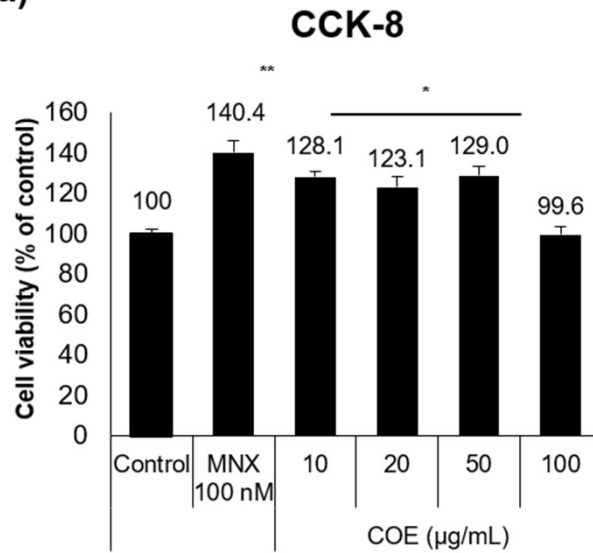
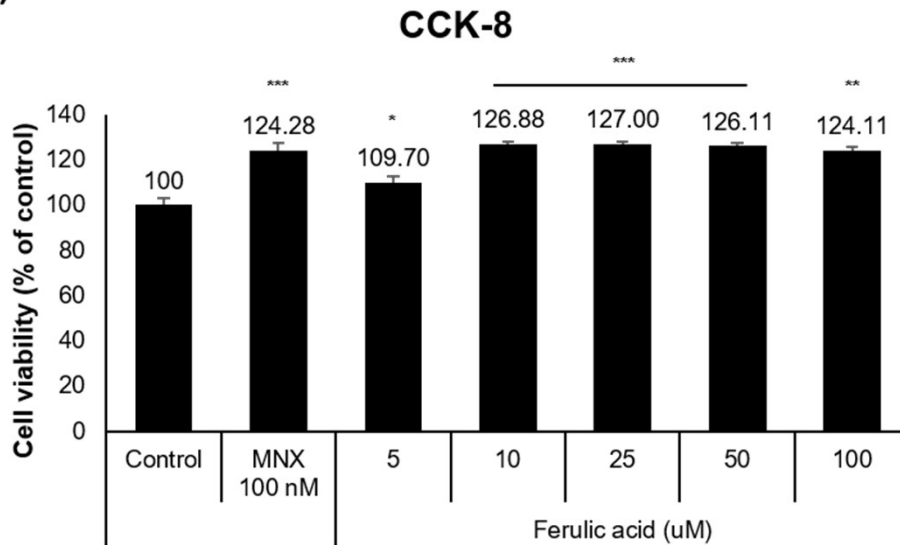


(a)

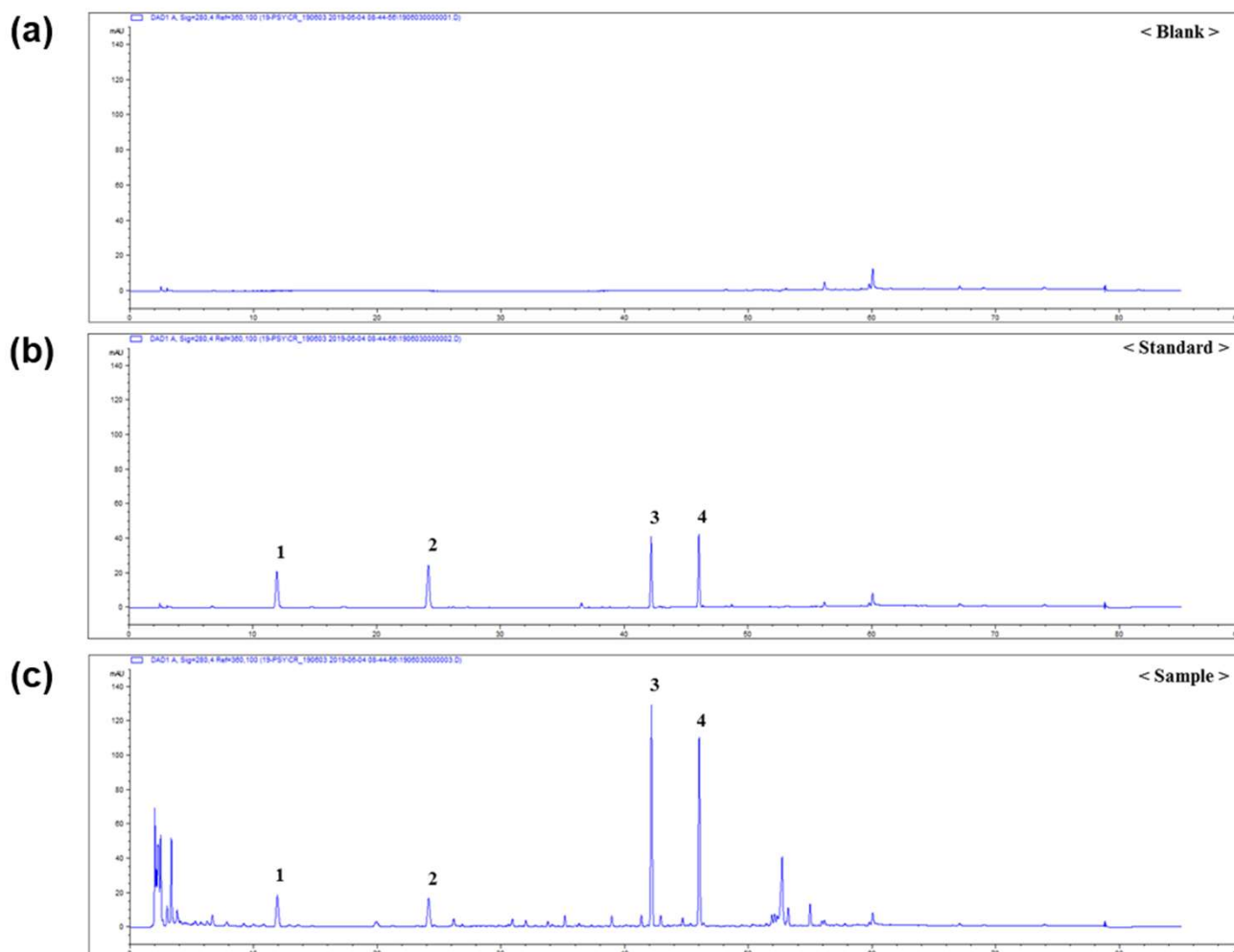


(b)



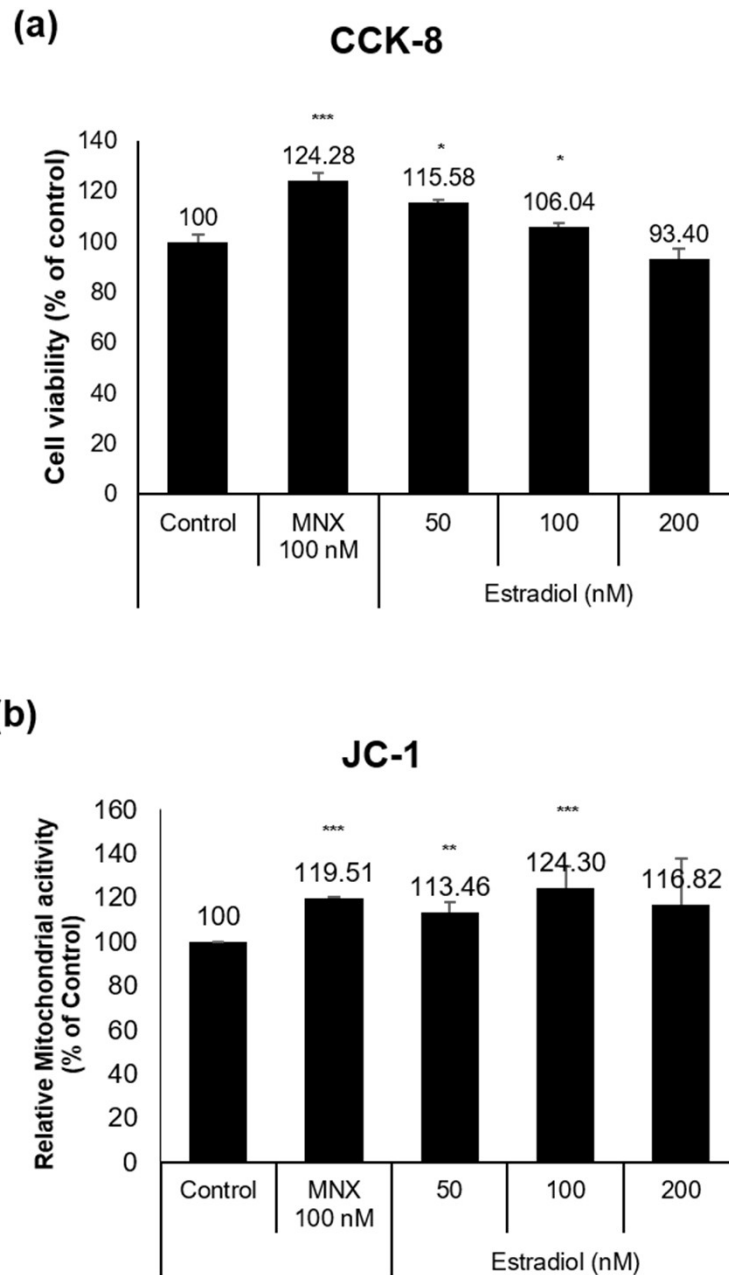
Supplementary Figure S1. Effect of COE and ferulic acid on cell proliferation in cultured DPCs

(a) Using CCK-8 assay, cell viability was measured after COE treatment (10, 20, 50, 100 µg/mL) for 24h. The 100 nM of minoxidil was used as a positive control. (b) Using CCK-8 assay, cell viability was measured after ferulic acid treatment (5, 10, 25, 50, 100 µM) for 24h. The 100 nM of minoxidil was used as a positive control; MNX, minoxidil; * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.



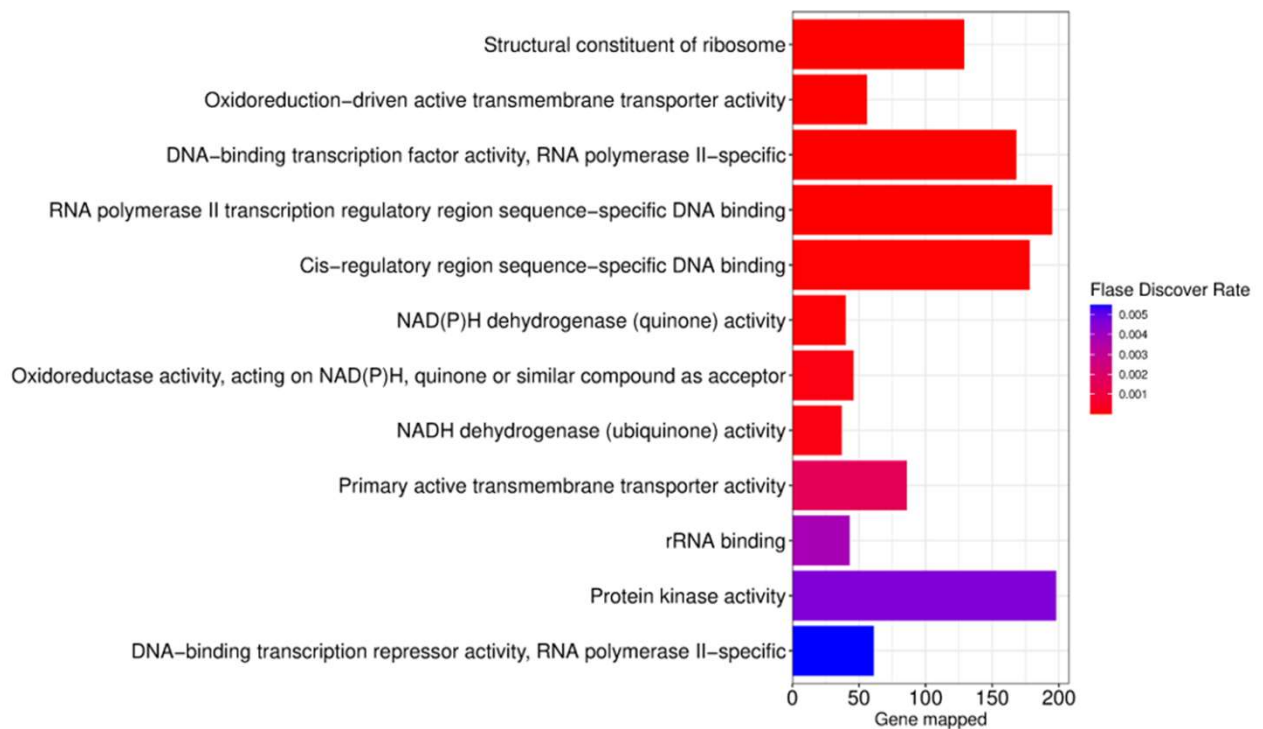
Supplementary Figure S2. Characterization of the extract of *Cnidium officinale* (COE)

COE was diluted 100 fold in 80% methanol. For quantitation, an external standard method was utilized. The standard stock solution of (1) Ferulic acid, (2) Senkyunolide I, (3) Senkyunolide A, (4) Z-ligustilide were prepared with 80% methanol just before use. HPLC fingerprint of standard solution at 280 nm and that of COE at 280 nm which depicted is the peak of standards; (a) Blank (b) Standard solution (c) COE



Supplementary Figure S3. Effect of estradiol on cellular energy metabolism in cultured DPCs

(a) Using CCK-8 assay, cell viability was measured after Estradiol treatment (50, 100, 200 nM) for 24h. The 100 nM of minoxidil was used as a positive control. (b) Using JC-1 assay, mitochondrial activity was measured after Estradiol treatment (50, 100, 200 nM) for 24h. Relative mitochondrial activity or mitochondrial membrane potential ($\Delta\Psi$), was expressed as the ratio of the aggregate form to the monomer form of JC-1 dye. The 100 nM of minoxidil was also used as a positive control; MNX, minoxidil; * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.



Supplementary Figure S4. Transcriptome analysis of estradiol in cultured DPCs

In Transcriptome analysis, DEG and GO analysis were performed on estradiol sample. Significant changes in gene expression were observed in the gene group related to Molecular Function during GO analysis at a False Discovery Rate of 25% stringency.