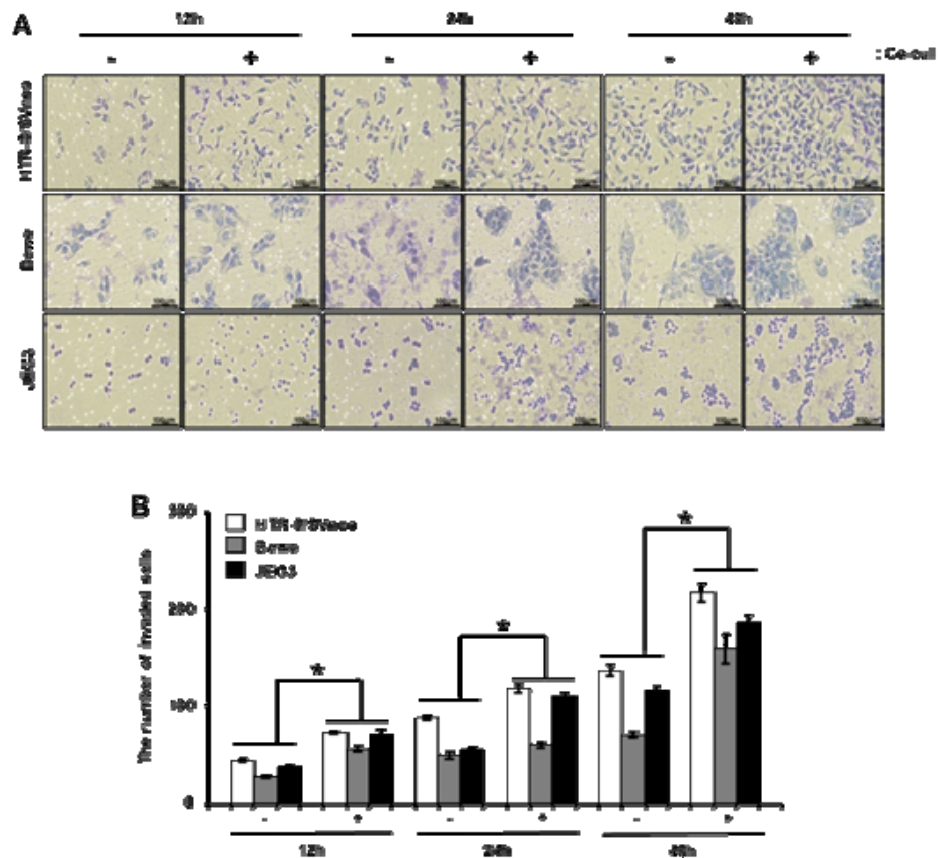
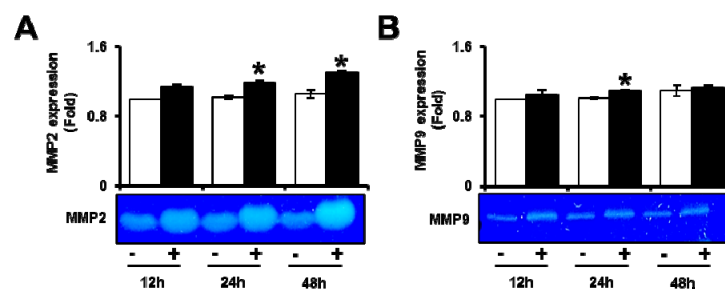


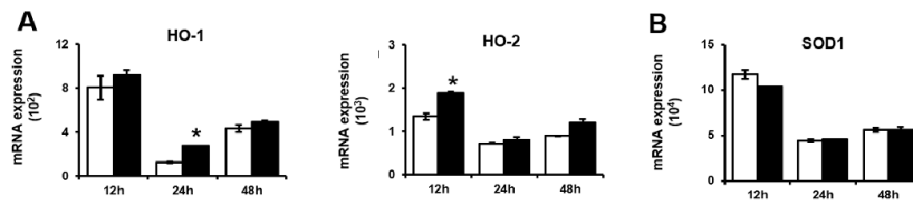
## Supplementary Materials



**Supplementary Figure S1.** PD-MSCs cocultivation induced invasion ability of different trophoblastic cell line. (A) Invasion ability of trophoblastic cell line was analyzed by trans well system. (B) The invaded cells were quantified by Image J program. The data was performed at least triplicate as the means  $\pm$  S.D. Indicates  $p < 0.05$ .



**Supplementary Figure S2.** PD-MSCs cocultivation induced MMP-2/-9 activities in trophoblast cells. (A) MMP-2 and (B) MMP-9 expression were analyzed by zymography. The intensity of MMP-2/-9 expression were quantified by Image J program. The data was performed at least triplicate as the means  $\pm$  S.D. Indicates  $p < 0.05$ . White bar: control, Black bar: PD-MSC cocultivation. \*: control vs. PD-MSC cocultivation at each time point.



**Supplementary Figure S3.** PD-MSCs regulate oxidative stress in invasive trophoblasts. The mRNA expression of (a) HO-1/-2 and (b) SOD1 in invasive trophoblast with and without to PD-MSC cocultivation over time. The data was performed at least triplicate and expressed as the means  $\pm$  S.D. Indicates  $p < 0.05$ . White bar: control, Black bar: PD-MSC cocultivation. \*: control vs. PD-MSC cocultivation at each time point.