



**Figure S1** The analysis of cell transcription characteristics of MSCs in different pathological tissues of osteosarcoma. (A) t-SNE visualization of the MSCs cell populations from the primary, metastatic, and recurrent OS tissues. (B) Venn result of the DEGs between metastasis versus primary and recurrent versus primary from MSCs. (C) The GO functional enrichment analysis of the DEGs of metastasis versus primary in MSCs. (D) The GO functional enrichment analysis of the DEGs of recurrent versus primary in MSCs.