

Supplementary Data Legends:

- **Supplementary Data 1:** RNA-seq dataset of TNBC tissues. (gene expression)
- **Supplementary Data 2:** ECM-enriched proteomics dataset of tumor and adjacent tissues. (proteomics dataset)
- **Supplementary Data 3:** N-linked glycomics profiling of tumor and adjacent tissues.
- **Supplementary Data 4:** Differentially expressed ECM-related genes identified between tumor and adjacent tissues.
- **Supplementary Data 5:** Differentially abundant ECM proteins identified between tumor and adjacent tissues.
- **Supplementary Data 6:** Patients characteristics