

## Description of Additional Supplementary Files

### **File Name: Supplementary Data 1**

Description: expression levels of representative lipids in different micro-regions of gastric cancer tissue from patient No.0429.

### **File Name: Supplementary Data 2**

Description: expression levels of glucose, glucose-phosphate, lactic acid, succinic acid, malic acid, histidine, histamine, FA-18:1, Lyso-PC-16:1, C26:2-OH-SFT, C22:0-OH-SFT, C22:1-OH-SFT, C24:0-OH-SFT, and C24:1-OH-SFT in normal epithelium (NE), serrated glandular structure (SGS), and tumor tissue of gastric cancer tissue section.

### **File Name: Supplementary Data 3**

Description: screened genes and pathways that enriched in serrated glandular structure (SGS) tissue.

### **File Name: Supplementary Data 4**

Description: marker genes for the cell cluster annotation of gastric cancer tissue.

### **File Name: Supplementary Data 5**

Description: expression levels of glutamine, glutamate arachidonic acid, docosahexaenoic acid, docosapentaenoic acid, and docosatetraenoic acid in different micro-regions of gastric cancer tissue from patient No.0406.

### **File Name: Supplementary Data 6**

Description: the raw values for the maximum tumour volume.