**Supplementary Information** 

## Preprocessing: We segment pixels to putative cell groups. We oversegment here so that every cell is covered by at lease one cell group. Groups can overlap, as shown for $G_1$ and $G_2$ . Estimation of Group Configuration: We merge/delete putative cell groups to approximate cell configurations. In this example, $G_4$ and $G_5$ are merged together. Optimization of Group Boundaries: We fit a continuous contour for every group. Local Pixel Refinement: We optimize the boundary pixels of every cell group according to content criteria in Section 2.

Table 1. Diagram for all four steps of the procedure