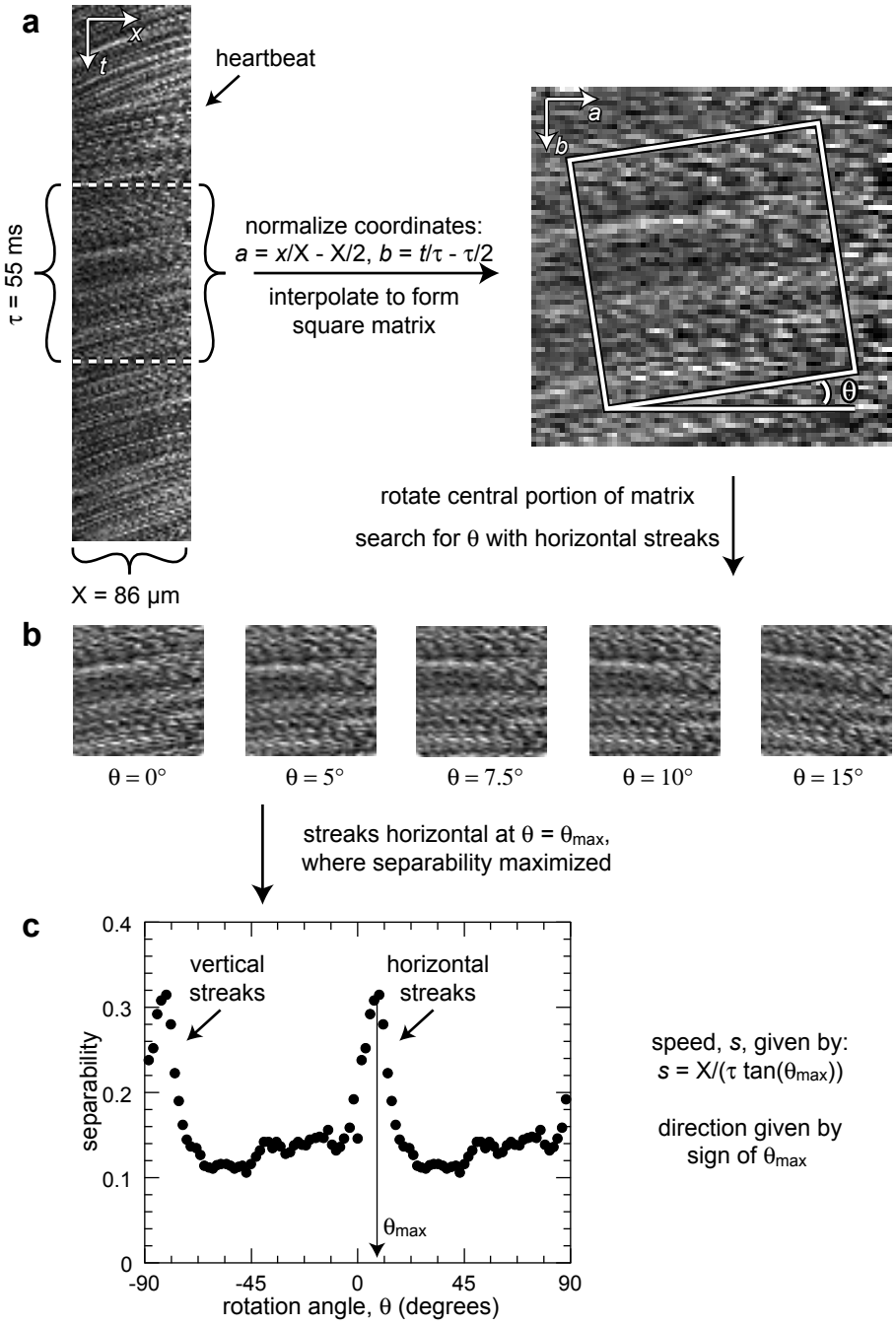

Supplementary Figure 2. Illustration of automated algorithm for finding slope of streaks formed by moving RBCs in TPLSM line-scan data. The data is for the same vessel shown in figure 1c, d, and e, although not from the same time point as figure 1d. **(a)** Line-scan data from an epoch in time is transformed to a square matrix with normalized axes. In the left image, an abrupt change in the slope of the streaks due to a heartbeat is indicated. **(b)** The central region of the square matrix is rotated, and we search for the angle that yields horizontal streaks, as in the middle panel. **(c)** Separability of line-scan data as a function of rotation angle; separability is maximal for vertical or horizontal streaks (Supplemental Text). The rotation angle corresponding to horizontal streaks is chosen, yielding the RBC speed and direction, in this case: 11.9 mm/s and a flow direction of right to left.