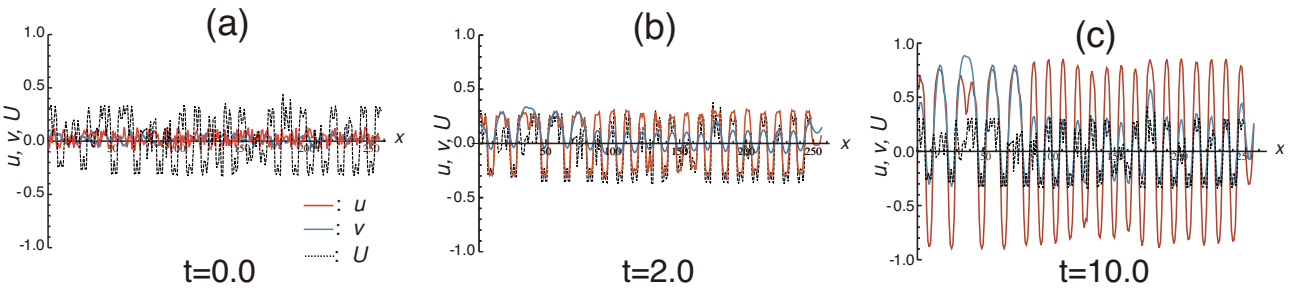

Fig. 1. Formation of spatial patterns obtained from Eqs. (1), (2), and (3) for (a) $t = 0.0$, (b) $t = 2.0$, and (c) $t = 10.0$. The thick red line, the thick blue line, and the dotted black line indicate $u(\vec{x}, t)$, $v(\vec{x}, t)$, and $U(\vec{x})$, respectively.

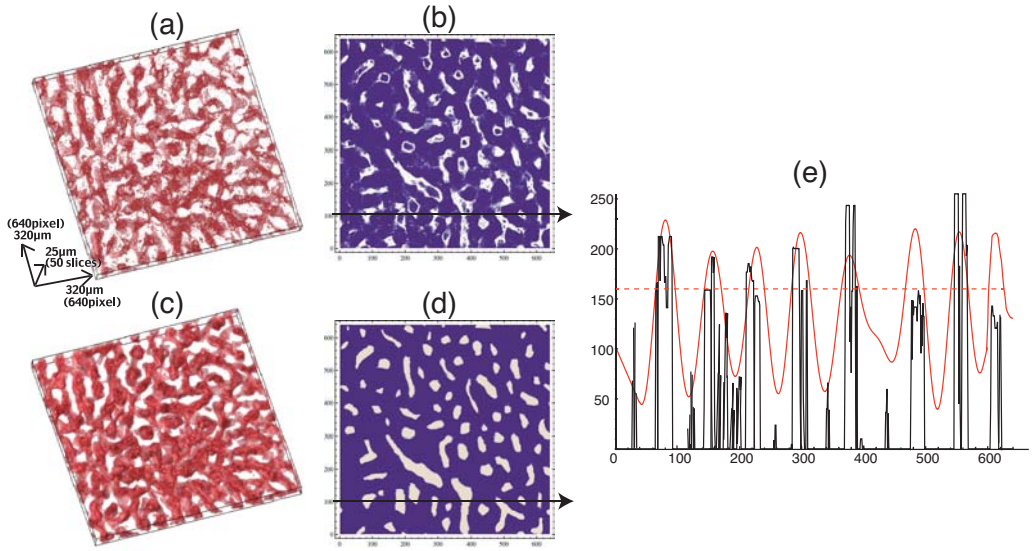

Fig. 2. The 3D reconstructed confocal images of liver sections from rats (a), (b), and their 3D segmentation images obtained using the algorithm proposed here (c), (d). (a) and (c) indicate the 3D patterns of the sinusoidal network (red tubes), and (b) and (d) show the slices at the middle position of the z-axis from (a) and (c), where the white area indicates positions inside the vein. (e) shows the spatial variations of the distributions of pixel data (black line) and the scaled distribution (red line) after RD processing of Eqs. (1) and (2) along the black arrow in (b) and (d). The dotted red line indicates the threshold of segmentations in the image processing, where the values above red line were considered to be inside the vein, and the values below red line were considered to be outside the vein or other types of cells.

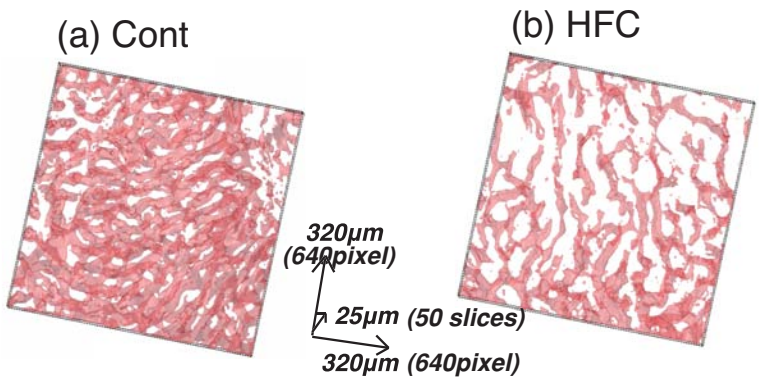

Fig. 3. Examples of 3D segmentation images obtained using the proposed algorithm of Control group (a) and HFC group (b). δ^* of the control group was 1.00 ± 0.05 and that of the HFC group was 1.45 ± 0.08. The difference was significant according to the Mann-Whitney U-test ($p < 0.01$).

[0,255] scale image of $U(\vec{x})$ into the $[-0.5, 0.5]$ range linearly. Equilibrium values $(\bar{u}, \bar{v})$ for white noise without any spatial correlations were given as the initial distributions of $u(\vec{x}, 0)$ and $v(\vec{x}, 0)$. We performed numerical simulations of Eqs. (1) and (2) with Eq. (3) in three dimensions.

The parameter for space-scaling, δ, was varied in the numerical simulations, whereas the other parameters were fixed. In the case of $\epsilon = 0$, stable periodic patterns with different periodicities are self-organized with changing δ. To examine the most suitable δ for pixel data obtained by