유정란 배아 혈액유동의 *in vivo*계측

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In Vivo Measurements of Blood Flow in a Chicken Embryo Using Micro PIV Technique

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Key Words : Blood flow(혈액유동), Embryo(태아), PIV(입자영상유속계), Placenta(태반)

Abstract : To analyze *in-vivo* blood flow characteristics in a chicken embryo, *in-vivo* experiment was carried out using micro-PIV technique. Because endothelial cells in blood vessels are subject to shear stressof blood flow, it is important to get velocity field information of the placental blood flow. The flow images of RBCs were obtained with a spatial resolution of 20×20μm in the whole blood vessels. The blood in a branched vessel merged smoothly without any flow separation into the main blood vessel with the presence of a slight bump. This *in-vivo* micro-PIV measurement technique can be used as a powerful tool in various blood flow researches.

X선 PIV 기법을 이용한 혈액 유동특성 연구

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X-ray PIV measurements of blood flows without any contrast media

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Key Words: X-ray PIV technique(X선 PIV기법), blood flow(혈액유동)

Abstract: Conventional medical instruments for diagnosing vascular diseases such as an angiography and doppler methods give rough information on the shape of blood vessels and point-wise blood speed. In this study, we developed a method called X-ray PIV technique for visualizing blood flow using a coherent synchrotron x-ray. Without any contrast agents or tracer particles, this X-ray PIV method can visualize the flow pattern of blood based on the diffraction and interference characteristics of blood cells. The quantitative velocity field information of blood flow inside an opaque tube was obtained by applying a 2-frame PIV (particle image velocimetry) algorithm to the x-ray images obtained. The velocity field data obtained are compared with various models for analysing blood flows.