

World Center of Education and Research for Trans-disciplinary Flow Dynamics

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Research title: Particle Image Velocimetry (PIV) experiment in eccentric and concentric models.

Supervisor: Prof. Makoto OHTA.

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My research activity in biofluid laboratory was to do particle image velocimetry (PIV) experiment in eccentric and concentric artery models. According to previously published literatures, 81% of human coronary arteries have eccentric lesions, by considering this issue; an experimental set up was prepared to observe the effect of eccentricity on fluid behaviour in two silicone models which resembled the human coronary arteries.

Glycerol and NaI aqueous were used as working fluid. The flow field was seeded by Techpolymer particles to get the fluid velocity by tracking these particles. Steady and unsteady PIV experiments were done using a roller pump. For steady experiment, six different flow rates were used to see the effect of Reynolds number on flow parameters, especially, recirculation length. For unsteady experiment, a sinusoidal flow rates was produced to observe the difference of cyclic behaviour of the flow in both eccentric and concentric models.

Experimental results showed that eccentricity increases recirculation flow happens in post stenotic regions. In addition, eccentric model had greater velocity and shear stress than those of concentric models. These results are in good agreement with previously published literatures.

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Also, I would like to thank biofluid lab members for their hospitality and organising very nice welcome and farewell parties for me.

Last but not least, thank you; GCOE, for giving the opportunity of having this wonderful experience.



Biofluid Laboratory Members



PIV set up, Biofluid lab.