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Inside Flow of Mosquito's Proboscis KENJI KIKUCHI, Toyo University, NOBUYUKI TERADA, OSAMU MOCHIZUKI, BIOMECHANICAL ENGINEERING LABORATORY TEAM — Mosquito has a magnificent pump mechanism which has been never achieved by technology. We want to apply this high performance mechanism to a micro-TAS system which is designed for a daily check of blood to keep a human health. We need a high powered pump similar to a mosquito's sucking blood mechanism and a low-resistance micro channel mimicked a surface of proboscis. The details of mosquito's pump mechanism, however, have not been ascertained yet. Therefore we tried to investigate the mosquito's pump mechanism by measuring the flow due to suction. A visualization of flow was done by a confocal micro-PIV system. We could analyze the velocity vector profile in the proboscis. The velocity distribution in the proboscis is necessary to estimate the friction drag. In the experiment, a live mosquito was fixed on the glass plate and fed nano-particles near the tip of proboscis. We found that the inside flow of proboscis deviate from Hargen-Poisueuille Flow. It indicates that the surface of inside proboscis has unknown fact for the friction drag reduction.

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