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Paper Title: Artificial pupil fabrication using network-shape cultured skeletal muscle tissue

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Abstract

Recently, the use of cultured skeletal muscle tissue as a soft actuator has attracted much attention. Conventional studies using three-dimensional cultured muscle tissue have mainly focused on linear movements. In contrast, this study mimics a ring-shaped pupillary structure to achieve opening and closing movements of the aperture. Because the fibers of the sphincter muscles of the pupil are arranged in a ring, we use pillars to control the orientation of the cultured muscle fibers. Experimental results show that pupil contractile movement is realized and that the proposed device improves the contractile force. In the future, we aim to apply this device to develop an actuator to open and close the aperture.
