



Showcasing research from Professor Takeharu Nagai's laboratory at the Department of Biomolecular Science and Engineering, SANKEN, The University of Osaka, Osaka, Japan. Artwork by Asako Chio.

Compact lens-free imager using a thin-film transistor for long-term quantitative monitoring of stem cell culture and cardiomyocyte production

This study addresses the need for practical devices to ensure quality control in long-term cell cultures and production processes. By incorporating a large thin-film transistor image sensor and rear side dark-field illumination, the authors developed a compact lens-free imager capable of monitoring six independent culture wells simultaneously in an incubator named INSPCTOR. INSPCTOR enables monitoring the confluency of pluripotent stem cell cultures and identifying the timing of cell state transitions during mesoderm induction, as well as tracing the beating frequency and conduction patterns of cardiomyocytes throughout long-term differentiation and maturation processes. This device facilitates quality control of cell products and has the potential to contribute to advancements in regenerative medicine and drug discovery.

### As featured in:



See Takeharu Nagai *et al.*,  
*Lab Chip*, 2024, **24**, 5290.