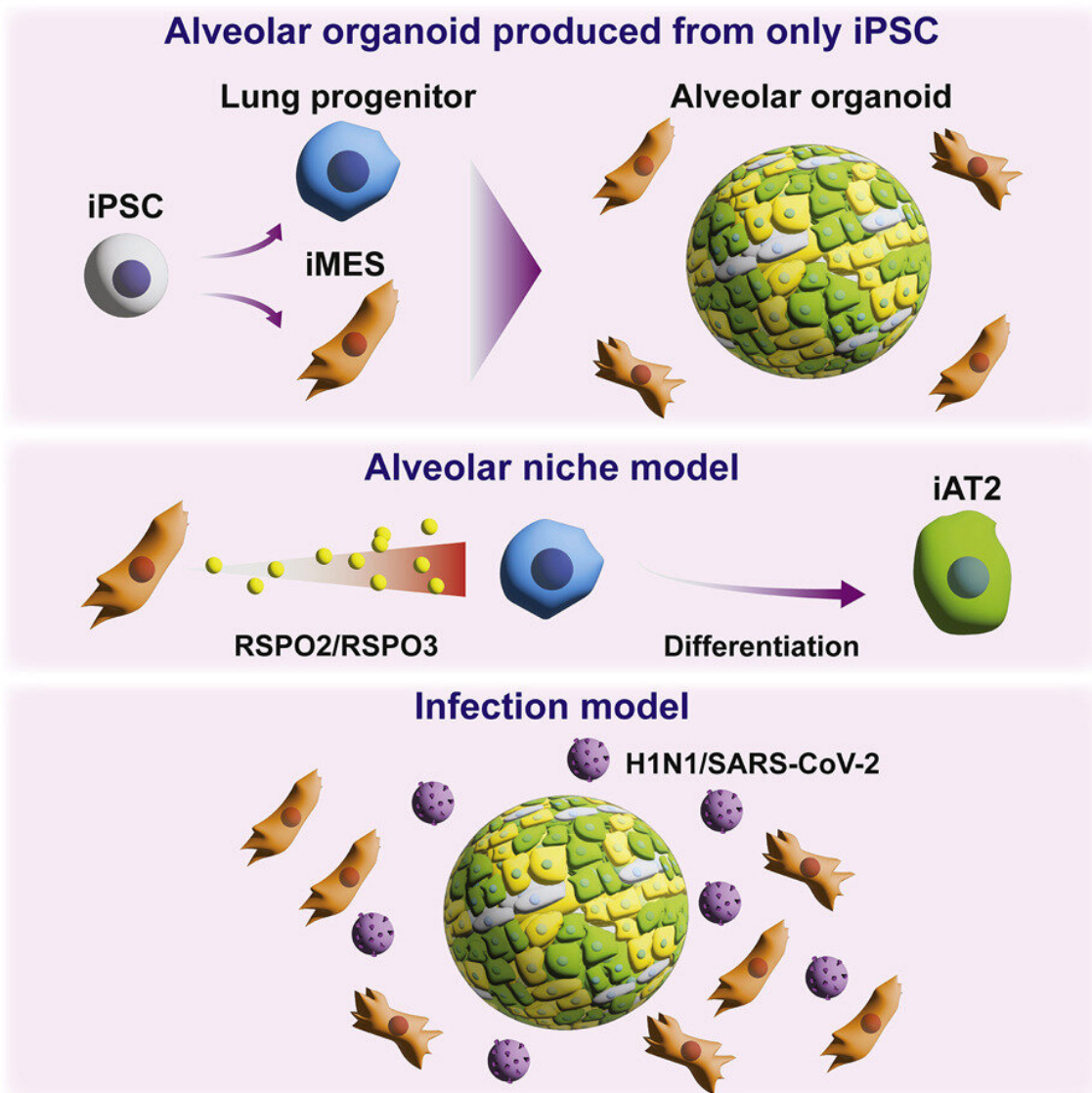


Successful generation of human iPSC cell-derived mesenchymal cells capable of producing alveolar organoids

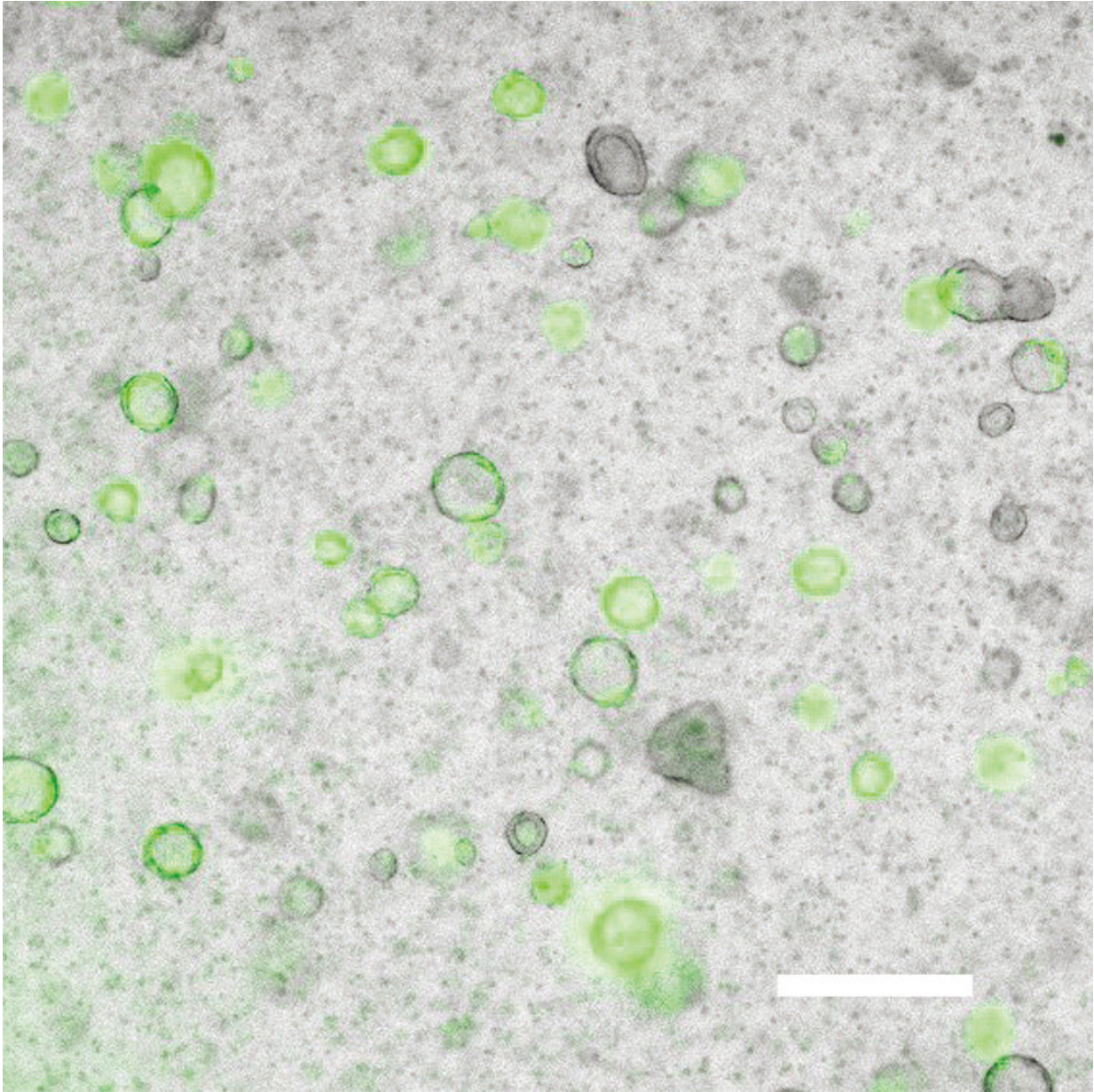
November 2 2022



Graphical abstract. Credit: *Cell Reports Methods* (2022). DOI: 10.1016/j.crmeth.2022.100314

Breathing intakes oxygen and expels carbon dioxide, and this gas exchange takes place in the alveoli in the lungs. Alveoli contain type 1 alveolar epithelial cells (AT1), which are involved in the actual gas exchange, and type 2 alveolar epithelial cells (AT2), which produce surfactants to prevent a collapse of the alveolar space. The interaction between epithelial cells and mesenchymal cells is essential for alveolar development.

In a previous study, the research group generated alveolar organoids containing AT1 and AT2 cells by co-culturing with human fetal lung fibroblasts (HFLFs) and used them for disease modeling. This new study aimed to create iPS cell-derived [mesenchymal cells](#) (iMES) that can induce [alveolar epithelial cells](#), without using HFLFs.



Microscopic images of iMES-AOs generated by 3D co-culture of iMES with lung progenitor cells derived from iPS cells. Green indicates AT2 cells; Scale bar = 500 μm .

The research group successfully generated iMES that can induce alveolar organoids (iMES-AOs) comprising not only AT2 cells but also AT1

cells, pulmonary neuroendocrine cells, and ciliated cells. Furthermore, they demonstrated that iMES-AOs could be used in influenza virus and SARS-CoV-2 infection models.

In the future, iMES-AOs are expected to be used in research on lung development and regenerative medicine, and respiratory disease models.

The results of this study were published online in *Cell Reports Methods* on September 19, 2022.

More information: Koji Tamai et al, iPSC-derived mesenchymal cells that support alveolar organoid development, *Cell Reports Methods* (2022). [DOI: 10.1016/j.crmeth.2022.100314](https://doi.org/10.1016/j.crmeth.2022.100314)

Provided by Kyoto University

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