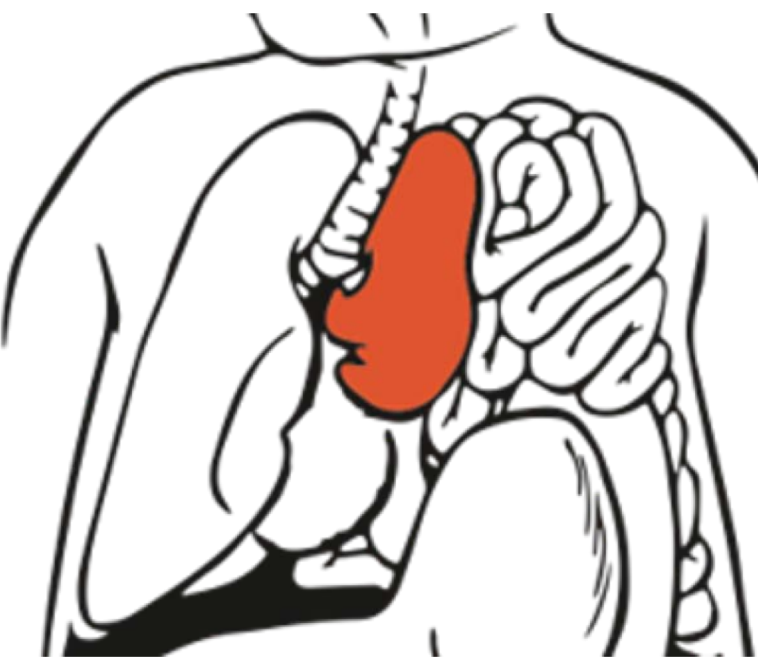
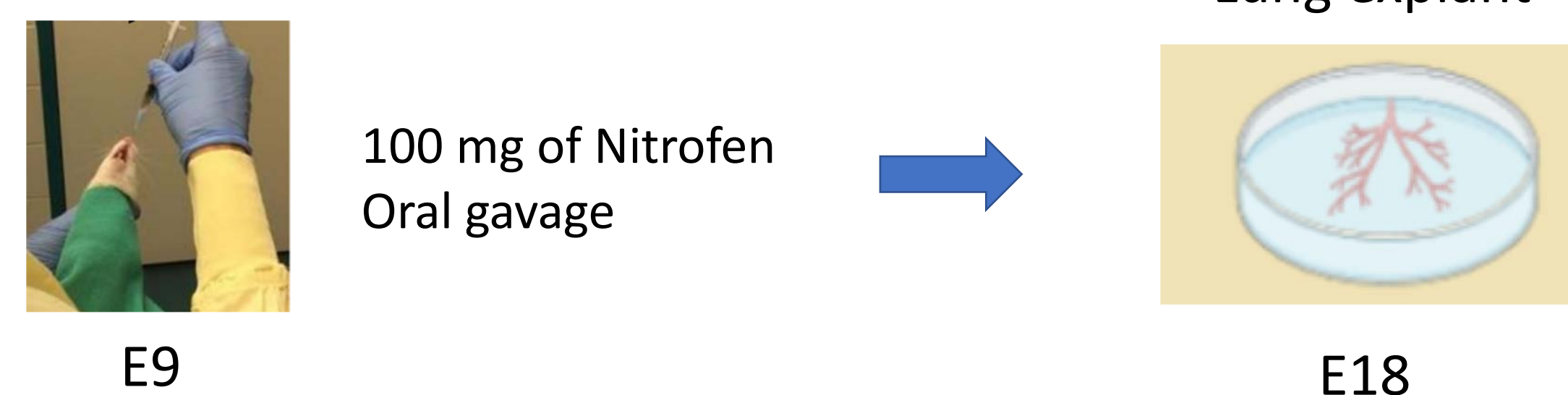


## Introduction/Aim

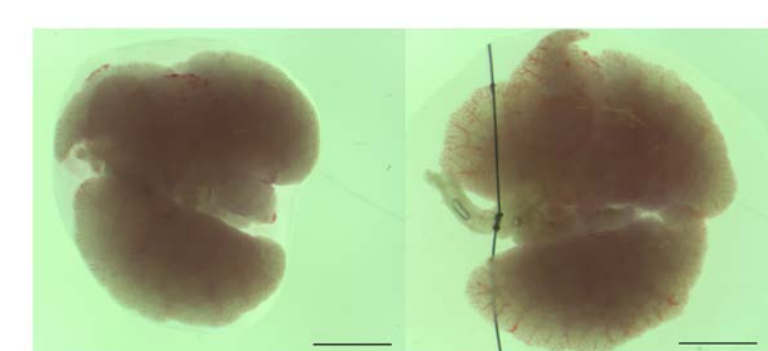
- Congenital diaphragmatic hernia (CDH) patients present with a hole in the diaphragm and abnormal lung development. 
  - Fetoscopic endoluminal tracheal occlusion (FETO) improves survival rate in fetuses with severe CDH.
  - To better understand FETO, many animal tracheal occlusion (TO) models have been developed.
  - But each model requires *in vivo* operation. Disadvantage: ethical issues; cost; surgical difficulty.
- ↓
- An animal model, which is feasible, cost-effective, has a good survival rate, and can mimic CDH, is desired.
  - Here, we established a novel tracheal occlusion model with lung explants in CDH model.

## Methods

### 1) Rat model for CDH



### 2) Tracheal occlusion model



- Tie the trachea by 7-0 surgical suture
- Culture for 1-3 days
- NonTO lungs (TO-) vs TO lungs (TO+)

### 3) Evaluation Parameters

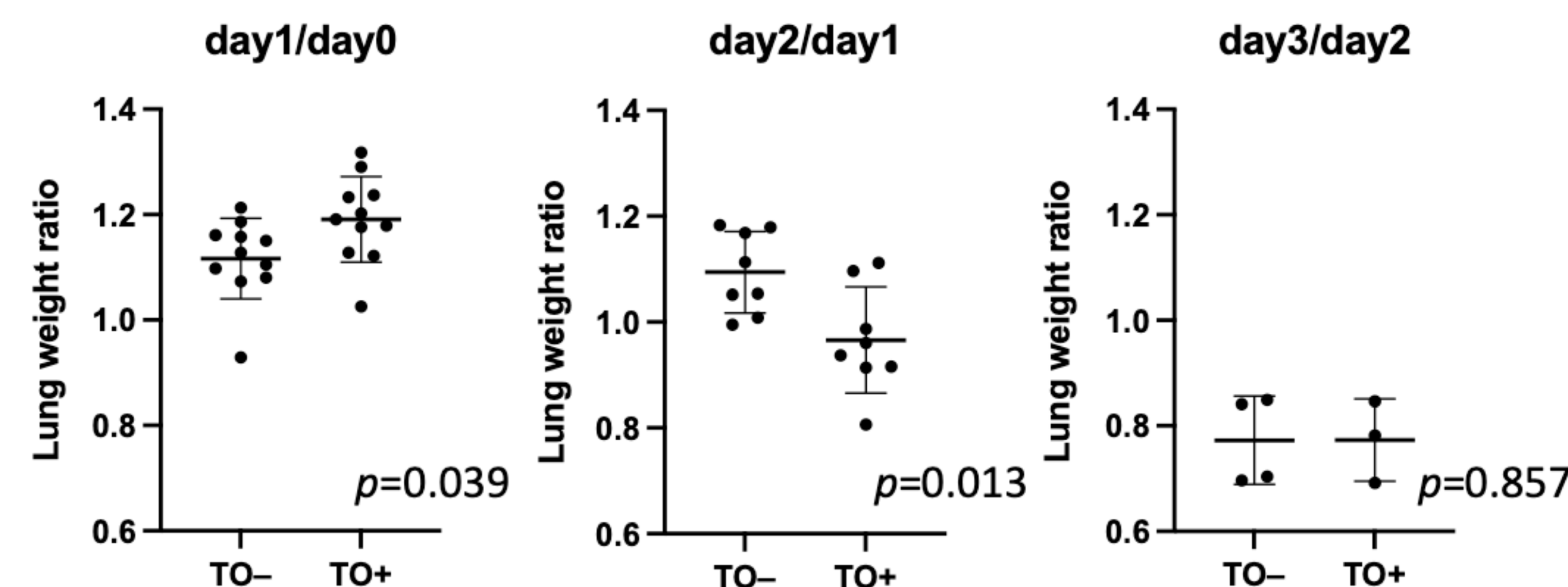
- ✓ Lung weight /morphometry

- ✓ Immunofluorescence (IF)

Ki-67: cell proliferation  
Active caspase-3: apoptosis  
Prosulfactant protein C: type II pneumocyte

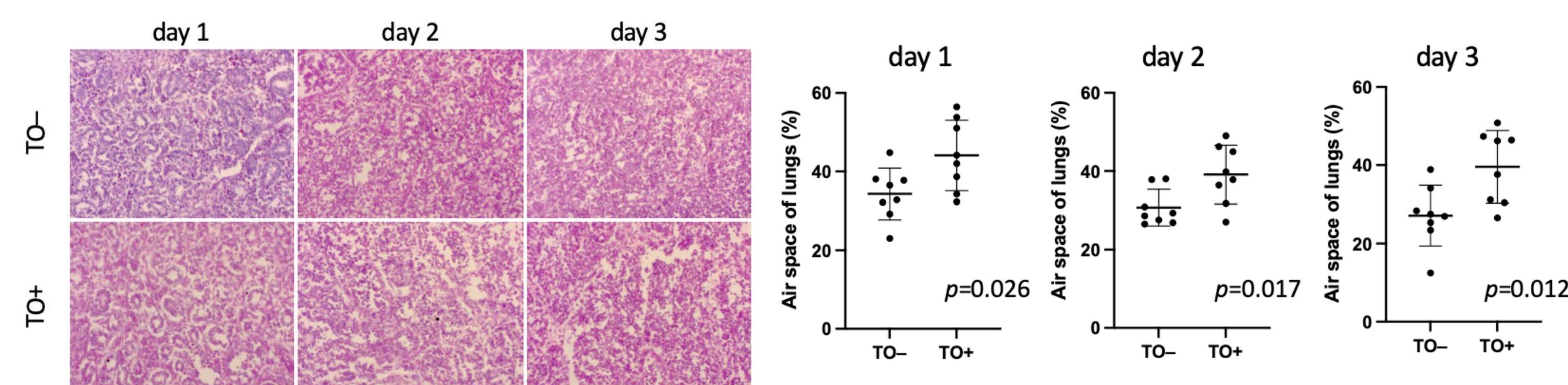
## Results

### 1) Lung weight



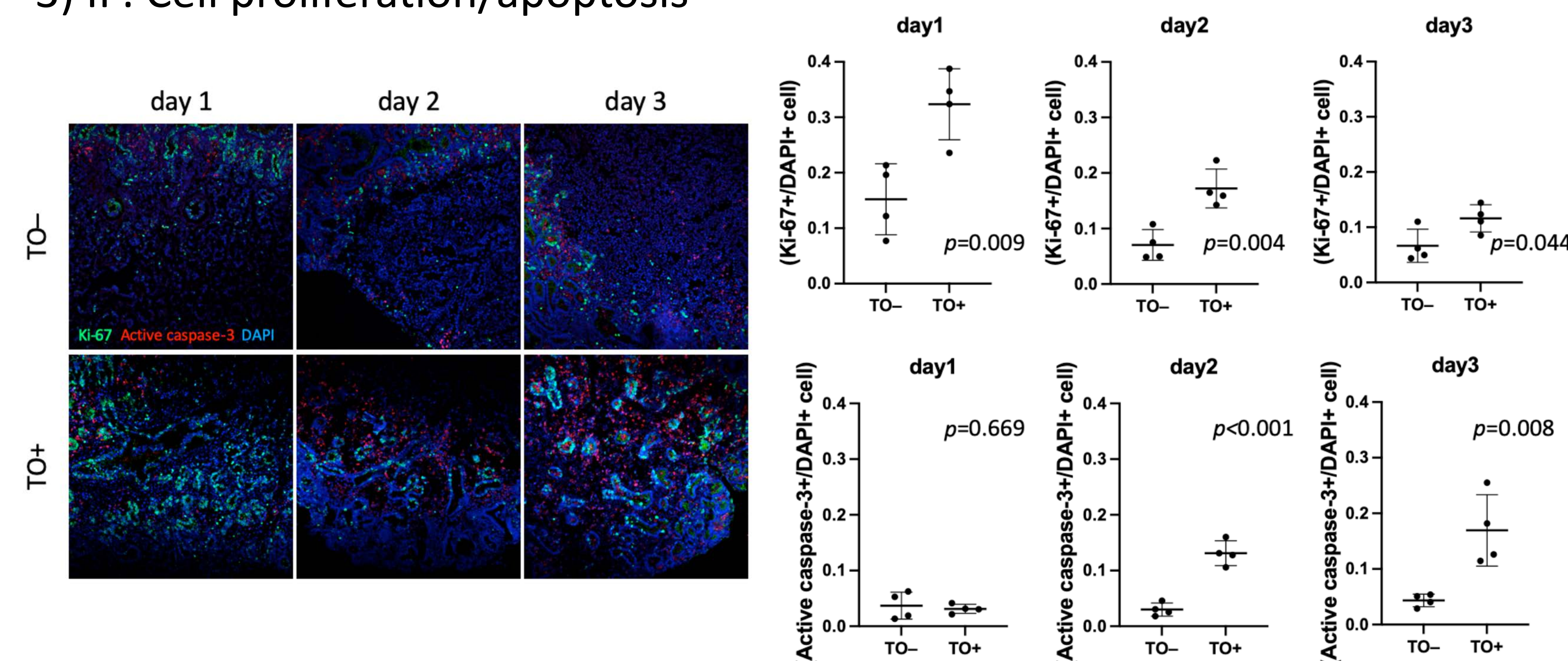
Lung weight gain was significantly higher on day 1 and significantly lower on day 2 in TO+ than TO-. (TO- vs TO+: 1.12 vs. 1.19 for day 1, 1.09 vs. 0.97 for day 2, 0.77 vs. 0.77 for day 3).

### 2) Air space of lungs



Air spaces of lungs were significantly higher in TO+ than TO-. (TO- vs TO+: 34.3% vs. 44.1% for day 1, 30.7% vs. 39.1% for day 2, 27.2% vs. 39.6% for day 3).

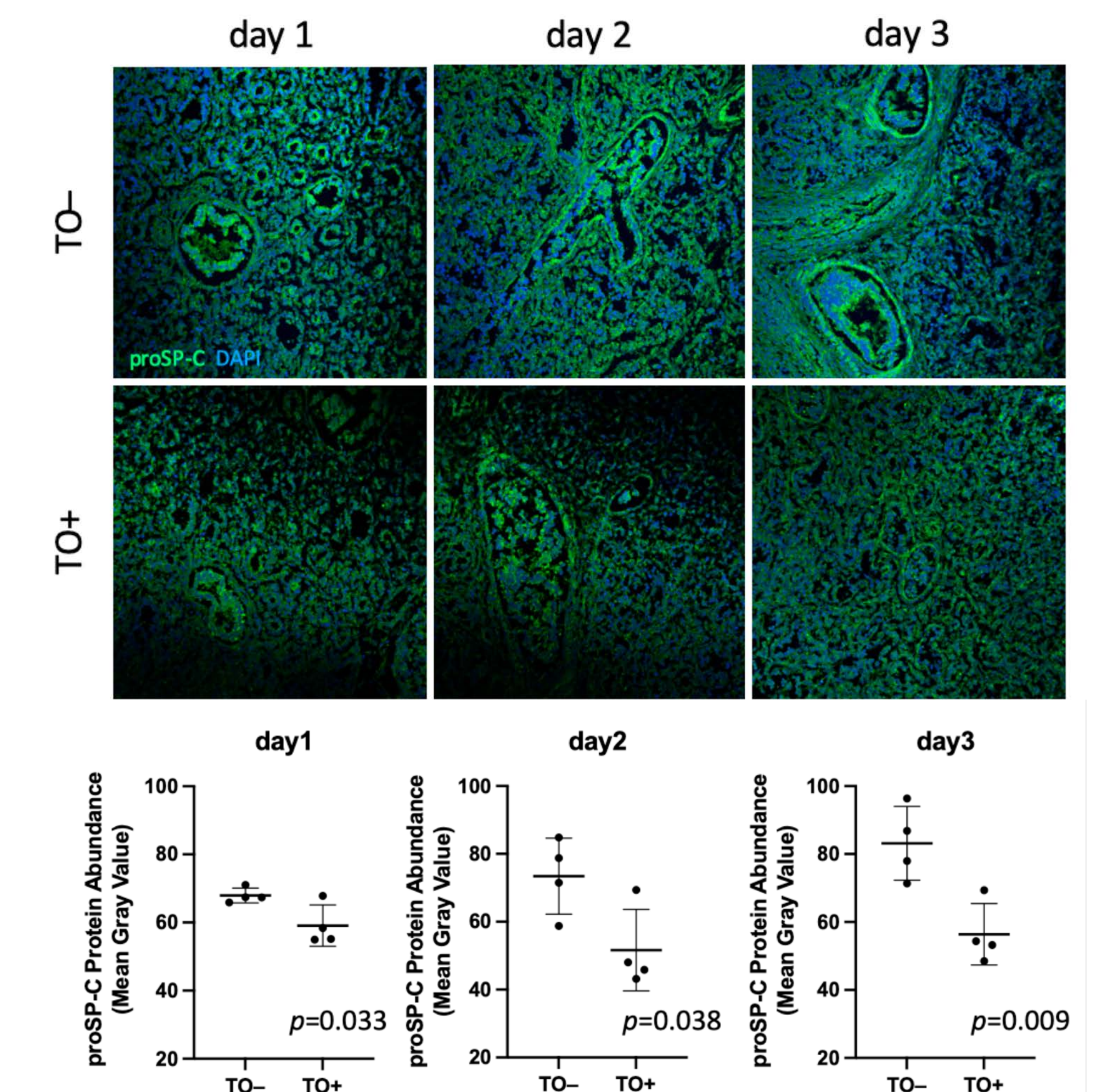
### 3) IF: Cell proliferation/apoptosis



- % Ki-67/DAPI+ were significantly higher in TO+ than TO-. (TO- vs TO+: 0.15 vs. 0.32 for day 1, 0.07 vs. 0.12 for day 2, 0.07 vs. 0.12 for day 3)
- % Active caspase-3/DAPI+ were significantly higher in TO+ than TO- on day 2 and day 3. (TO- vs TO+: 0.04 vs. 0.03 for day 1, 0.03 vs. 0.13 for day 2, 0.04 vs. 0.17 for day 3)

## Results

### 4) type II pneumocyte function



ProSP-C protein abundance were significantly lower in TO+ than TO-. (TO- vs TO+: 67.9 vs. 59.1 for day 1, 73.5 vs. 51.6 for day 2, 83.1 vs. 56.4 for day 3).

## Conclusion

- TO model in lung explant provides comparable outcomes to other current animal models.

- ✓ Organised lung growth
- ✓ Cell proliferation/apoptosis ↑
- ✓ Type II pneumocyte function ↓

- Further studies with this model can reveal the cellular and molecular effects of TO in CDH lungs.

## Contact

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