**Supplementary Material**

**Supplement Table 1.** Primers used for qRT-PCR analysis.

| Gene                   | Primer sequence                  | NCBI accession number |
|------------------------|----------------------------------|-----------------------|
| Mouse ACTA2            | Forward – CTGACAGAGGCCACCACTGAA  | NC_000085.6           |
|                        | Reverse – CATCTCCAGAGTCCAGCACA    |                       |
| Mouse FN               | Forward – ACCACCCAGAACTACGATGC   | NC_000067.6           |
|                        | Reverse – GGAACGTGTCGTTCACATTG   |                       |
| Mouse collagen Iα1     | Forward – CACCCTCAAGAGCCTGAGTC   | NC_000077.6           |
|                        | Reverse – GTTCGGGGCTGATGTACCAGT  |                       |
| Mouse 18S              | Forward – AAACGGCTACCACATCCAAG   | NC_000083.5           |
|                        | Reverse – CCTCAATGGATCTCGTTA     |                       |
| Human ACTA2            | Forward – CCG GGA GAA AAT GAC TCA AA | NC_000010.11         |
|                        | Reverse – GAA GGA ATA GCC ACG CTC AG |                       |
| Human FN               | Forward – TCG AGG AGG AAA TTC CAA TG | NC_000002.12         |
|                        | Reverse – ACA CAC GTG CAC CTC ATC AT |                       |
| Human collagen Iα1     | Forward – AGC CAG CAG ATC GAG AAC AT | NC_000017.11         |
|                        | Reverse – TCT TGT CCT TGG GGT TCT TG |                       |
| Human WNT2B            | Forward – CCG AGA GTG TCA GCA CCA AT | NC_000001.11         |
|                        | Reverse – CTG CCT CTC GGC TAC TTC TG |                       |
| Human WNT-5A           | Forward – GGG TGG GAA CCA AGA     | NC_000003.12           |
|                        | Reverse – TGG AAC CTA CCC ATC CCA TA |                       |
| Gene     | Forward  | Reverse  | Accession |
|----------|----------|----------|-----------|
| Human Axin2 | ACA ACA GCA TTG TCT CCA AGC AGC | GCG CCT GGT CAA ACA TGA TGG AAT | NC_000017.11 |
| Human FGF2 | AAA AAC GGG GGC TTC TTC CT | TGT AGC TTG ATG TGA GGG TCG | NC_000004.12 |
| Human FGF10 | ATG TCC GCT GGA GAA AGC TA | CCC CTT CTT GTT CAT GGC TA | NG_011446.1 |
| Human HGF | TGC CTG AAA GAT ATC CCG ACA A | GCC TTC TCC TTG ACC TTG GA | NC_000007.14 |
| Human SDHA | GGG AAG ACT ACA AGG TGC GG | CTC CAG TGC TCC TCA AAC GG | NG_012339.1 |

**Supplement Figure 1.** Four organoid culture systems.
Supplement Figure 2. ROCK1 expresses more than ROCK2 in human lung cells.

(A), ROCK1 and ROCK2 expression in human lung epithelial cells.

(B), ROCK1 and ROCK2 expression in other human lung cells.

All data are from human lung cell atlas (https://asthma.cellgeni.sanger.ac.uk/).


**Supplement Figure 3.** ROCK1 and ROCK2 expression in the lung.

(A-B), ROCK1 and ROCK2 expression in human epithelial cells. (C-D), ROCK1 and ROCK2 expression in human stromal cells. (E-F), ROCK1 and ROCK2 expression in different cell types in control (blue) and IPF patients (red). All data within this figure are acquired from the database of IPF lung cell atlas (http://www.ipfcellatlas.com/). Control: 29, COPD: 18 patients, IPF: 32 patients.