**Supplementary Material**

**Supplementary Table 1. Morphometric parameters of VSMCs in different culture condition.**

|                      | VSMCs 21%O₂ | VSMCs 75%O₂ | AS+VSMCs 21%O₂ | AS+VSMCs 75%O₂ |
|----------------------|-------------|-------------|----------------|----------------|
| **Area (µm²)**       |             |             |                |                |
| day0                 | 237.32±37.29| 233.08±45.16| 244.50±66.77   | 239.36±78.04   |
| day1                 | 278.19±42.37| 269.22±99.14| 271.73±61.19   | 260.96±67.99   |
| day3                 | 281.18±48.02| 271.17±59.24| 261.94±49.63   | 182.38±51.50   |
| day7                 | 296.09±53.54| 291.67±50.10| 279.19±57.71   | 186.75±72.80   |
| **Length (µm)**      |             |             |                |                |
| day0                 | 23.68±4.50  | 27.73±10.55 | 23.74±4.23     | 26.86±7.83     |
| day1                 | 28.31±6.34  | 28.48±5.64  | 27.64±4.27     | 27.20±5.99     |
| day3                 | 30.00±3.17  | 30.04±3.84  | 31.36±6.59     | 23.35±5.25     |
| day7                 | 31.21±5.86  | 30.21±6.21  | 31.69±8.02     | 22.62±4.56     |
| **Width (µm)**       |             |             |                |                |
| day0                 | 15.47±3.35  | 16.78±4.11  | 17.67±3.29     | 17.40±3.84     |
| day1                 | 15.97±2.40  | 15.49±3.27  | 16.30±2.22     | 15.44±2.24     |
| day3                 | 17.74±3.28  | 16.92±2.35  | 17.90±4.22     | 10.44±3.14     |
| day7                 | 18.24±3.32  | 18.62±4.85  | 18.95±3.70     | 10.36±2.14     |
| **Ratio (length-to-width)** |     |             |                |                |
| day0                 | 1.56±0.30   | 1.64±0.31   | 1.38±0.36      | 1.55±0.33      |
| day1                 | 1.81±0.48   | 1.89±0.44   | 1.71±0.24      | 1.75±0.39      |
| day3                 | 1.76±0.33   | 1.80±0.28   | 1.72±0.31      | 2.31±0.47      |
| day7                 | 1.67±0.24   | 1.72±0.18   | 1.65±0.18      | 2.21±0.37      |
Supplementary Table 2. P values of comparison between co-culture\&hyperoxia and other groups.

|                | AS+VSMCs 75%O₂ | VSİMCs 21%O₂ | VSİMCs 75%O₂ | AS+VSMCs 21%O₂ |
|----------------|----------------|--------------|--------------|----------------|
|                |                |              |              |                |
| Area           |                |              |              |                |
| day0           | 1              | 1            | 1            | 1              |
| day1           | 0.98           | 1            | 0.999        |                |
| day3           | 0.002          | 0.013        | 0.014        |                |
| day7           | 0.008          | 0.01         | 0.033        |                |
| Length         |                |              |              |                |
| day0           | 0.833          | 1            | 0.836        |                |
| day1           | 0.995          | 0.988        | 1            |                |
| day3           | 0.021          | 0.027        | 0.044        |                |
| day7           | 0.011          | 0.036        | 0.041        |                |
| Width          |                |              |              |                |
| day0           | 0.786          | 0.999        | 1            |                |
| day1           | 0.995          | 1            | 0.939        |                |
| day3           | 0              | 0            | 0.002        |                |
| day7           | 0              | 0.002        | 0            |                |
| Ratio (length-to-width) |            |              |              |                |
| day0           | 1              | 0.984        | 0.853        |                |
| day1           | 1              | 0.973        | 1            |                |
| day3           | 0.042          | 0.049        | 0.02         |                |
| day7           | 0.009          | 0.013        | 0.005        |                |