Supporting Information File

A strategy for rapid and facile fabrication of controlled, layered blood vessel-like structures

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Figure S1 The fibrin gel forms after mixing its two components within seconds under ambient conditions. In ten tests, the gel forms within 5 seconds with excellent reproducibility.

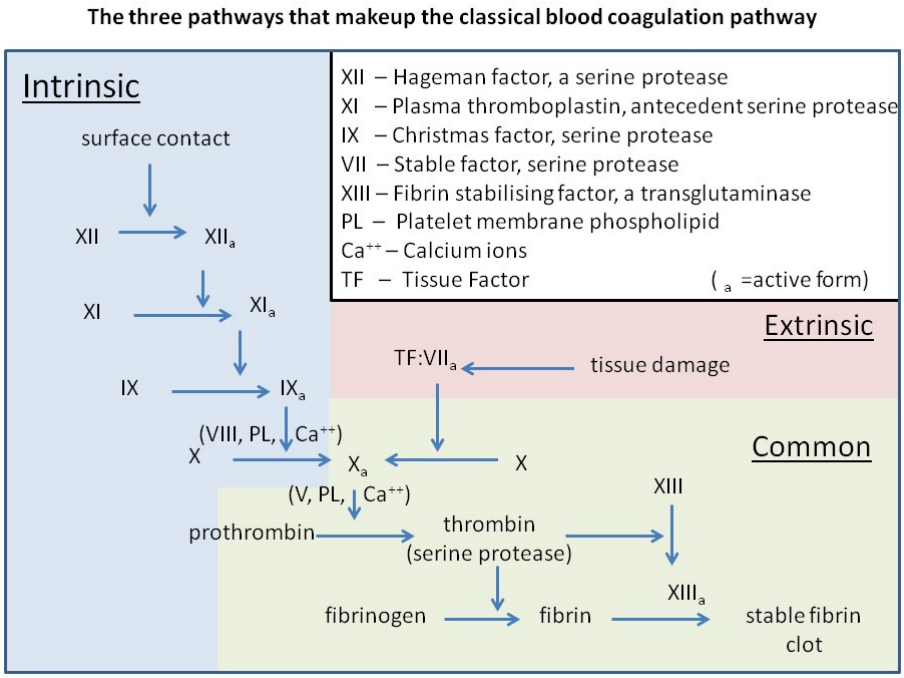

Figure S2 The classical blood coagulation pathway. The common stage (the light green part) illustrates the central role of thrombin in fibrin clot formation. Source: https://en.wikipedia.org/wiki/Coagulation#/media/File:Classical_blood_coagulation_pathway.png, which is based on the information in ref.[1].

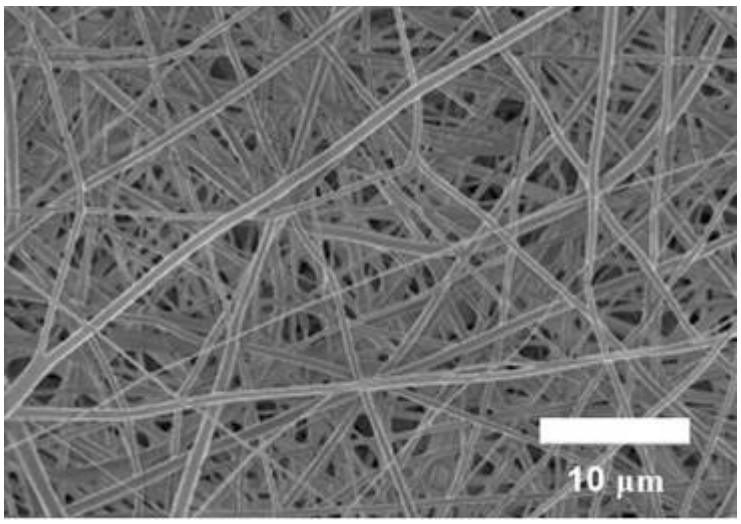

Figure S3 SEM imaging of PLGA electrospun film

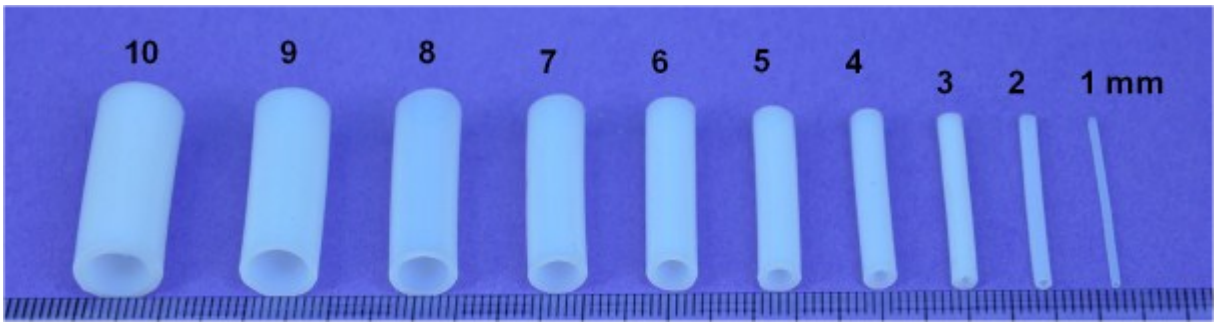

Figure S4 ePTFE mandrels with different outer diameters.

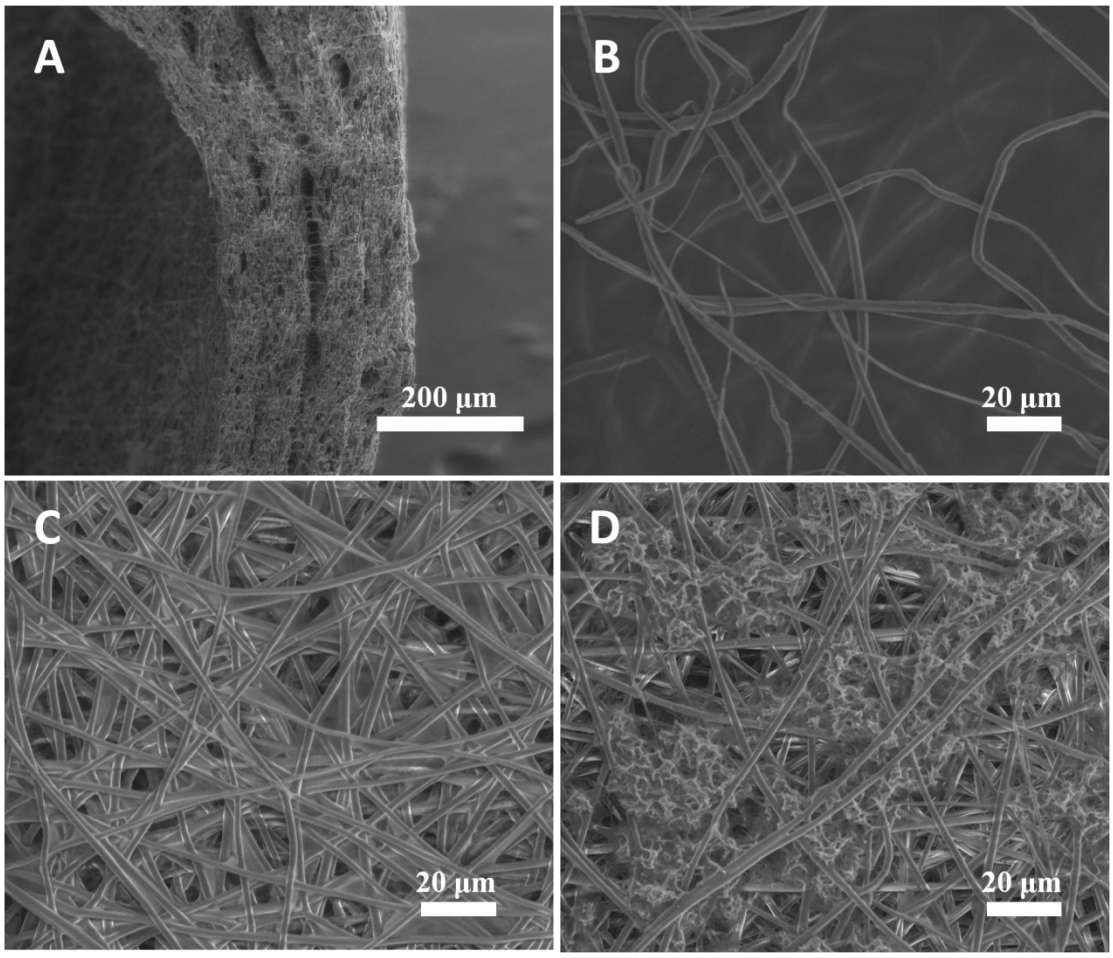

Figure S5 The microstructure of the glue. (A) The fibrin glue fibers between the interfacial layers. (B) The fibrin glue fibers on PLGA scaffold film surface. (C) The component A on PLGA scaffold film surface. (D) The component B on PLGA scaffold film surface.

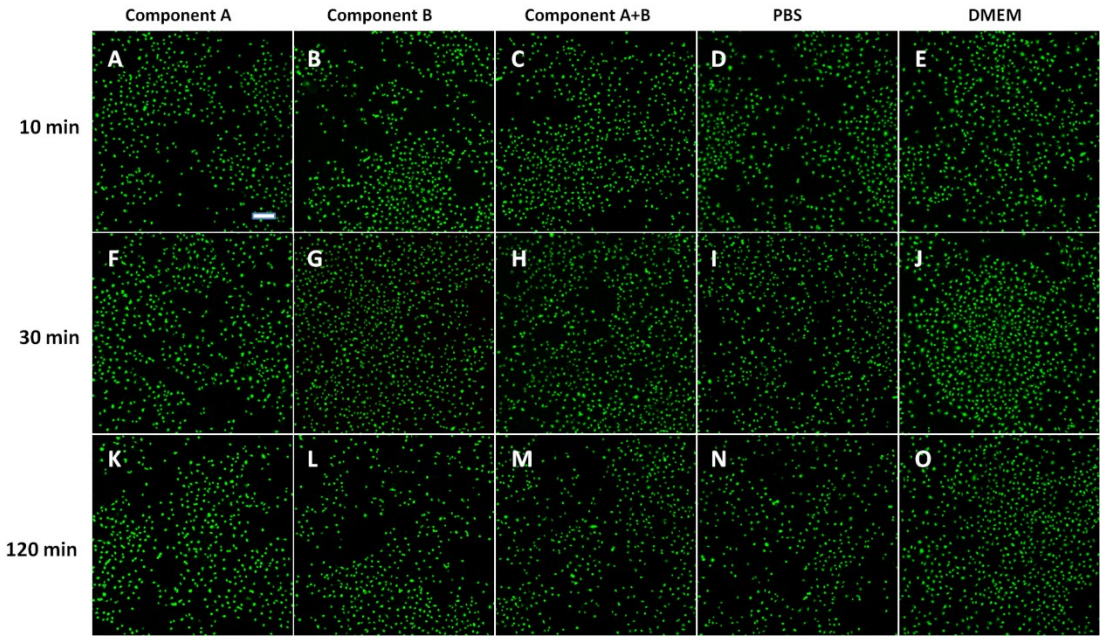

Figure S6 The effect of fibrin glue components dissolved in PBS (20% v/v) on HUVECs viability. A~E) 10-min treatment by component A of the glue (A), component B of the glue (B), mixture of component A and B (C), PBS (D), and DMEM (E), under ambient condition, respectively. F~J) 30-min treatment by component A of the glue (F), component B of the glue (G), mixture of component A and B (H), PBS (I), and DMEM (J), under ambient condition, respectively. K~O) 120-min treatment by component A of the glue (K), component B of the glue (L), mixture of component A and B (M), PBS (N), and DMEM (O), under ambient condition, respectively. The results illustrate that the viability of cells in different conditions has no significant differences. Green: live cells, Red: dead cells. Scale bar=50 μm.

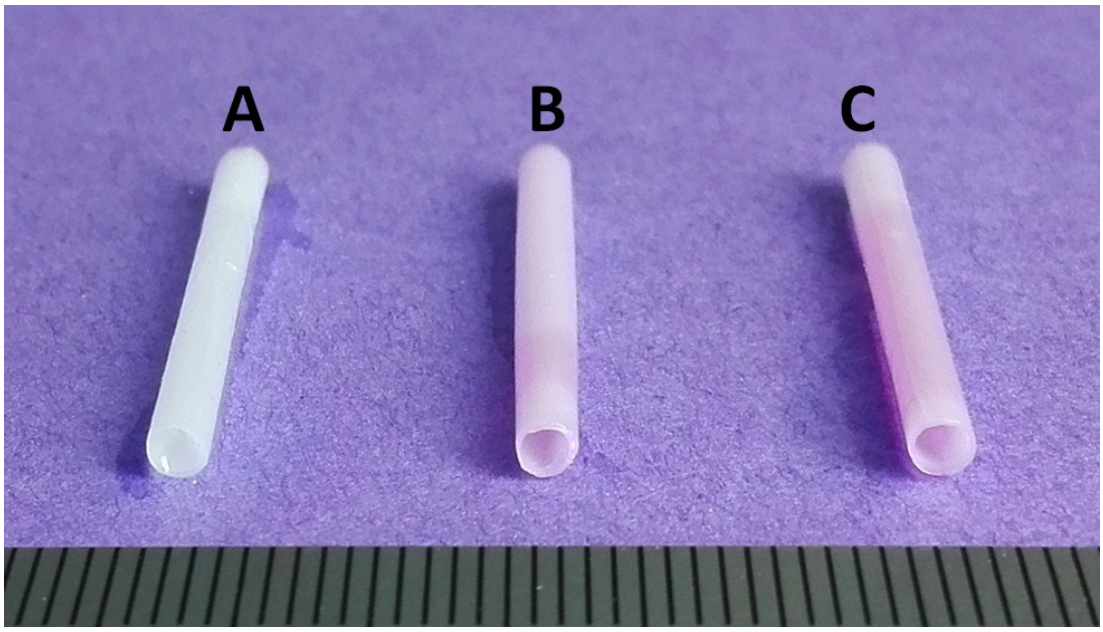

Figure S7 (A, B) The cell-free scaffolds after 3-d treatment in PBS (A) and DMEM (B) at 37°C. (C) The cell-seeded scaffold after 3-d treatment in cell culture incubator at 37°C, 5%CO_2. The picture illustrates their integrity.

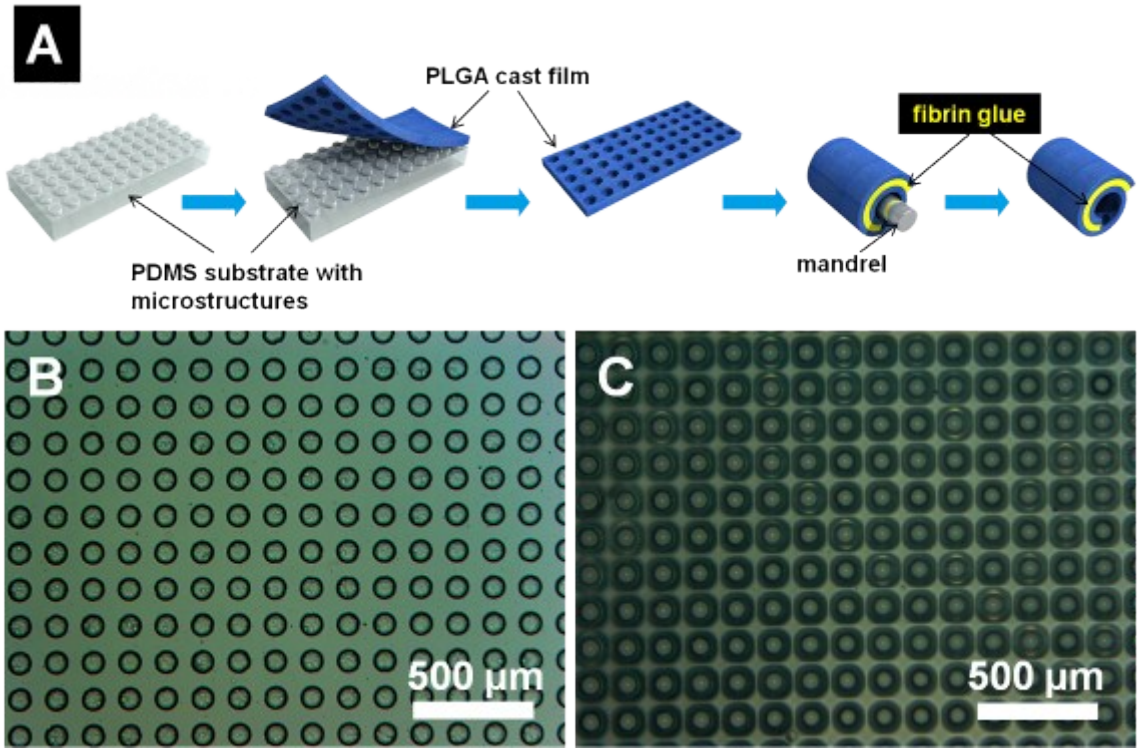

Figure S8 Fabrication of tubes with microwells. (A) The fabrication process. (B) Optical imaging of the PDMS substrate of the cast film with micropillars. (C) Optical imaging of the PLGA50:50 cast film with microwells complementary to the substrate. The rolled-up tube is shown in **Figure 2G**.

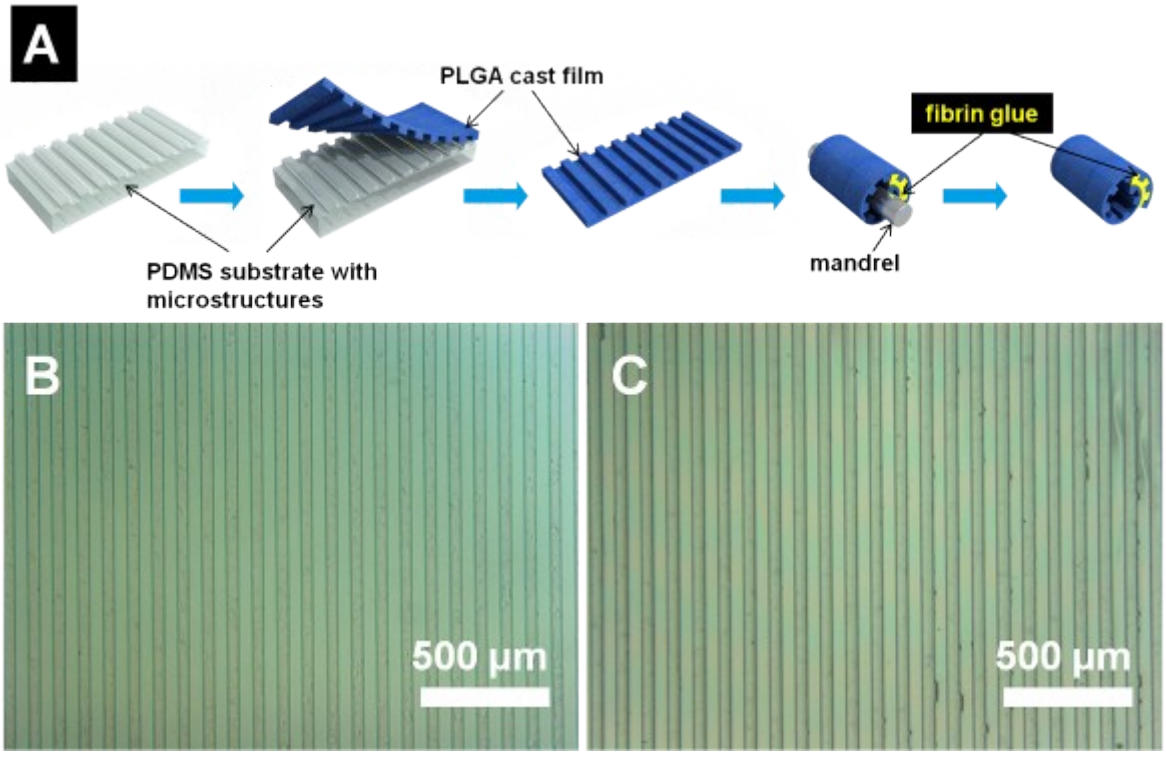

Figure S9 Fabrication of tubes with microgrooves. (A) The fabrication process. (B) Optical imaging of the PDMS substrate of the cast film with microgrooves. (C) Optical imaging of the PLGA50:50 cast film with microgrooves complementary to the substrate. The rolled-up tube is shown in **Figure 2H**.

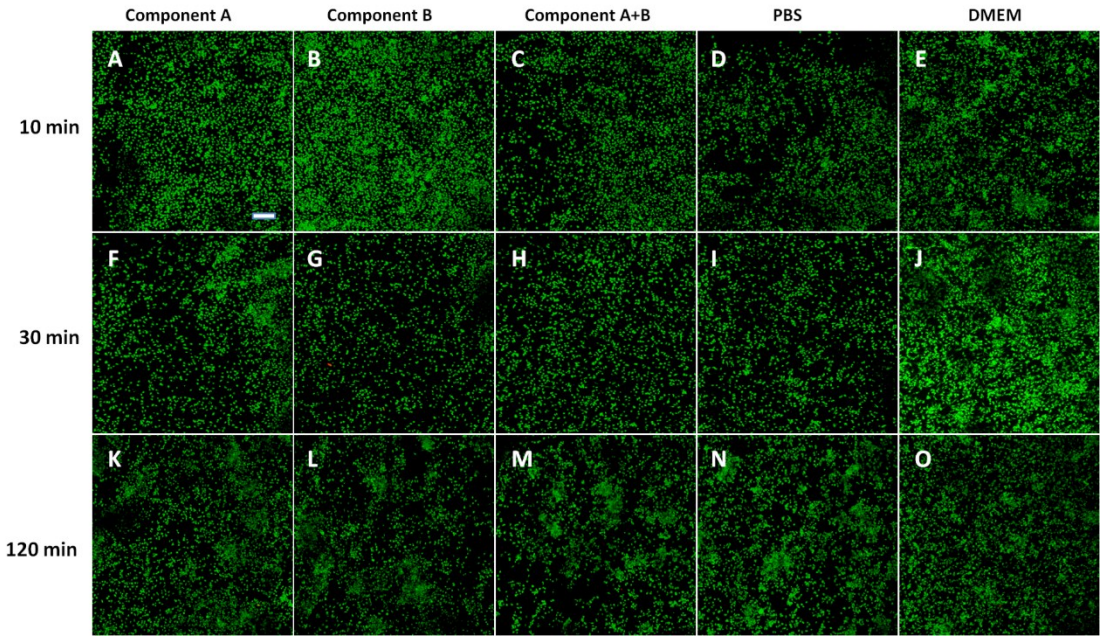

Figure S10 The effect of fibrin glue components directly coated on cell-seeded PLGA film on HUVECs viability. A~E) 10-min treatment by component A of the glue (A), component B of the glue (B), mixture of component A and B (C), PBS (D), and DMEM (E), under ambient condition, respectively. F~J) 30-min treatment by component A of the glue (F), component B of the glue (G), mixture of component A and B (H), PBS (I), and DMEM (J), under ambient condition, respectively. K~O) 120-min treatment by component A of the glue (K), component B of the glue (L), mixture of component A and B (M), PBS (N), and DMEM (O), under ambient condition, respectively. The results illustrate that the viability of cells in different conditions has no significant differences. Green: live cells, Red: dead cells. Scale bar=50 μm.

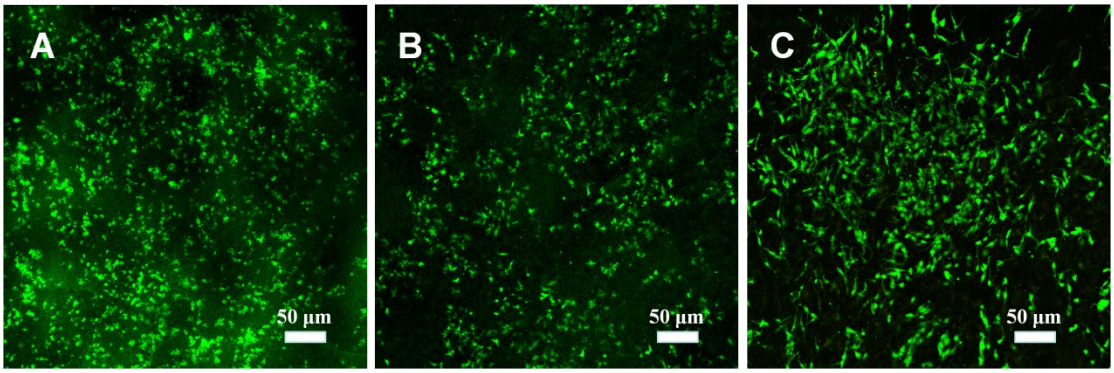

Figure S11 Cell viability after 3-d culture in a cell culture incubator. (A) HUVEC. (B) HASMC. (C) HAF. Green: live cells, Red: dead cells.

References

[1] Pallister CJ and Watson MS (2010). Haematology. Scion Publishing. pp. 336–347. ISBN 1-904842-39-9.