CLAIMS

1. A chimeric protein comprising a fibrinogen fragments capable of binding to fibrinogen upon thrombin treatment and a laminin fragment having integrin-binding activity, wherein the laminin fragment is in the form of a heterotrimer comprising C-terminal regions of laminin α, β, and γ chains, wherein the fibrinogen fragment is in the form of a heterotrimer comprising N-terminal regions of fibrinogen Aα, Bβ, and γ chains, and wherein the chimeric protein further comprises a second fibrinogen fragment, and wherein each of the Aα, Bβ, and γ chains of both the first and second fibrinogen fragments is fused to any one of the α, β, and γ chains of the laminin fragment in any one of the following combinations (1) to (3), and wherein the first and second fibrinogen fragments associate with each other through their N-terminal regions to form a hexamer: (1) the fibrinogen Aα chain is fused to the laminin β chain, the fibrinogen Bβ chain is fused to the laminin α chain, and the fibrinogen γ chain is fused to the laminin γ chain; (2) the fibrinogen Aα chain is fused to the laminin α chain, the fibrinogen Bβ chain is fused to the laminin γ chain, and the fibrinogen γ chain is fused to the laminin β chain; and (3) the fibrinogen Aα chain is fused to the laminin γ chain, the fibrinogen Bβ chain is fused to the laminin β chain, and the fibrinogen γ chain is fused to the laminin α chain.

2. The chimeric protein according to claim 1, further comprising a protein having growth factor-binding activity, wherein the protein having growth factor-binding activity is a heparan sulfate proteoglycan, and wherein the heparan sulfate proteoglycan is fused to the chimeric protein either directly or via a spacer or a linker.

3. A fibrin gel comprising the chimeric protein according to claim 1 or 2.

4. A method for producing the fibrin gel according to claim 3, comprising the step of preparing a mixture of the chimeric protein according to claim 1 or 2, fibrinogen, and thrombin.

5. The method according to claim 4, wherein the molar ratio of the chimeric protein to the fibrinogen in the mixture is 1:5 to 1:20,000.

6. A composition for gel preparation comprising the chimeric protein according to claim 1 or 2 and fibrinogen.

7. A kit for preparing the gel according to claim 3, the kit comprising the chimeric protein according to claim 1 or 2, fibrinogen, and thrombin.

8. A method for three-dimensional culture of cells or tissue fragments, comprising the step of culturing the cells or the tissue fragments in the fibrin gel according to claim 3.

9. A method for producing cells or organoids for transplantation medicine, comprising the step of culturing the cells or tissue fragments in the fibrin gel according to claim 3.

10. The method according to claim 9, wherein the cells are: cardiomyocytes, vascular endothelial cells, adipocytes, fibroblasts, myoblasts, hepatocytes, pancreatic cells, intestinal epithelial cells, alveolar epithelial cells, airway epithelial cells, kidney cells, hematopoietic cells, immune cells, nerve cells, eye tissue cells, and/or epidermal cells.

11. The method according to claim 9, wherein the organoids are: kidney, liver, gastrointestinal tract, lung and trachea, cerebrum, and/or blood vessels, wherein the gastrointestinal tract comprises stomach, intestines, and esophagus.