CLAIM(S):

1. A cell culture arrangement comprising

(a) a housing having a first end and a second end and a longitudinal axis; and

(b) at least one fixed bed arranged in the housing, the at least one fixed bed comprising a continuous pleated porous medium comprising a top end, a bottom end, a front side, a rear side, a right side, and a left side, and a plurality of pleats folded on the right side and the left side, and having vertical fluid flow channels along the longitudinal axis between adjacent pleats,

wherein at least a portion of the adjacent pleats is in contact, and

wherein the plurality of pleats is configured such that, the adjacent pleats are moveable relative to one another in response to fluid flow passes between the adjacent pleats, thereby adjusting a spacing between the adjacent pleats.

2. The cell culture arrangement of claim 1, wherein the continues pleated porous medium has a pleat density in the range of 25% to 95%, in which the 100% pleat density is defined as a combined thickness of all of the pleats inside the housing equalling the width of an internal cavity of the housing.

3. The cell culture arrangement of claim 1 or 2, including at least two fixed beds arranged in the housing, each of the at least two fixed beds comprising a continuous pleated porous medium comprising a top end, a bottom end, a front side, a rear side, a right side, and a left side, and a plurality of pleats folded on the right side and the left side, and having vertical fluid flow channels along the longitudinal axis between adjacent pleats,

wherein at least a portion of the adjacent pleats is in contact, and

wherein the plurality of pleats is configured such that, the adjacent pleats are moveable relative to one another in response to a fluid flow passes between the adjacent pleats, thereby adjusting a spacing between the adjacent pleats.

4. The cell culture arrangement of any one of claims 1-3, including a plurality of removable sampling elements comprising porous media inserted in the continuous pleated porous medium.

5. A cell culture device comprising:

(a) the cell culture arrangement according to any one of claims 1-4;

(b) a pump body arranged at a second end of a housing of the cell culture arrangement, the pump body including a central cavity;

(c) an impeller arranged in the central cavity of the pump body; and;

(d) a cell culture vessel having a central chamber, wherein the cell culture arrangement is arranged in the central chamber.

6. A method of culturing cells, the method comprising:

placing cell culture media and cells in the cell culture device of claim 5; and,

operating the impeller.

7. The method of claim 6, further comprising harvesting the cultured cells.