digestion reagents into components comprising of galacturonic acid monomers and the divalent cation, and wherein the digestion reagents comprise EDTA in a concentration of less than 1mM, or the EDTA and an enzyme.

[0010] In the present disclosure, a method of harvesting cultured cells from a dissolvable substrate is provided. The method include separating the cultured cells from the substrate by digesting the substrate via exposure of the substrate to (i) a chelating agent, (ii) an enzyme, or (iii) a chelating agent and an enzyme, the separating resulting in a harvest solution; and

performing a series of wash and/or centrifugation cycles of components of a harvest solution following the separating. The substrate comprising a polygalacturonic acid compound selected from at least one of: pectic acid; partially esterified pectic acid, partially amidated pectic acid and salts thereof, and an adhesion polymer on the surface of the polygalacturonic acid compound.

[0010a]In another aspect, the present disclosure refers to a method of harvesting cultured cells from a dissolvable substrate, the method comprising: separating the cultured cells from the substrate by digesting the substrate via exposure of the substrate to (i) a chelating agent, or (ii) a chelating agent and an enzyme, wherein the chelating agent is EDTA in a concentration of less than 1 mM, the separating resulting in a harvest solution; and performing a series of wash and/or centrifugation cycles of components of a harvest solution following the separating, wherein the substrate comprising a polygalacturonic acid compound selected from at least one of: pectic acid; partially esterified pectic acid, partially amidated pectic acid and salts thereof, and an adhesion polymer on the surface of the polygalacturonic acid compound.

[0011] Additional features and advantages of the subject matter of the present disclosure will be set forth in the detailed description which follows, and in part will be readily apparent to those skilled in the art from that description or recognized by practicing the subject matter of the present disclosure as described herein, including the detailed description which follows, the claims, as well as the appended drawings.

[0012] It is to be understood that both the foregoing general description and the following detailed description present embodiments of the subject matter of the present disclosure, and are intended to provide an overview or framework for understanding the nature and character of the subject matter of the present disclosure as it is claimed. The accompanying drawings are included to provide a further understanding of the subject matter of the present disclosure, and are incorporated into and constitute a part of this specification. The drawings illustrate various embodiments of the subject matter of the present disclosure and together with the description serve to explain the principles and operations of the subject matter of the present disclosure. Additionally, the drawings and descriptions are meant to be merely illustrative, and are not intended to limit the scope of the claims in any manner.

What is Claimed Is:

1. A cell culture article, comprising:

a substrate comprising a polygalacturonic acid compound crosslinked with a divalent cation, the polygalacturonic acid compound selected from at least one of: pectic acid; partially esterified pectic acid, partially amidated pectic acid and salts thereof;

wherein the substrate is digestible by digestion reagents into components comprising of galacturonic acid monomers and the divalent cation, and

wherein the digestion reagents comprise EDTA in a concentration of less than 1mM, or the EDTA and an enzyme.

2. The article of claim 1, wherein the substrate is spherical or substantially spherical with a diameter of 10 to 500 micrometers.

3. The article of claim 1 or claim 2, wherein the divalent cation concentration ranges from 0.5 to 2 g/l of the substrate.

4. The article of claim 3, wherein the divalent cation is selected from the group consisting of calcium, magnesium and barium.

5. The article of any of the preceding claims, further comprising an adhesion polymer on the surface of the substrate.

6. The article of claim 5, wherein the adhesion polymer is grafted to or coated on the surface of the substrate.

7. The article of any one of the preceding claims, wherein the polygalacturonic acid compound is ionotropically crosslinked.

8. The article of any one of the preceding claims, wherein the digestion reagents comprise at least one of EDTA and pectinase.

9. The article of claim 5 or claim 6, wherein at least a portion of the adhesion polymer becomes soluble when the substrate is digested.

10. The article of claim 9, wherein the portion of the adhesion polymer that becomes soluble is at least 40%, at least 50%, at least 60%, at least 70%, at least 80%, at least 90%, or at least 95%.

11. A method of harvesting cultured cells from a dissolvable substrate, the method comprising:

separating the cultured cells from the substrate by digesting the substrate via exposure of the substrate to (i) a chelating agent, or (ii) a chelating agent and an enzyme, wherein the chelating agent is EDTA in a concentration of less than 1 mM, the separating resulting in a harvest solution; and

performing a series of wash and/or centrifugation cycles of components of a harvest solution following the separating,

wherein the substrate comprising a polygalacturonic acid compound selected from at least one of: pectic acid; partially esterified pectic acid, partially amidated pectic acid and salts thereof, and an adhesion polymer on the surface of the polygalacturonic acid compound.

12. The method of claim 11, wherein the enzyme comprises a non-proteolytic enzyme.

13. The method of claim 11 or claim 12, wherein digesting the dissolvable substrate comprises exposing the dissolvable substrate to between 1 U/mL and 200 U/mL of the enzyme, or between 1 U/mL and 50 U/mL, or between 1 U/mL and 30 U/mL, or less than 30 U/mL.

14. The method of any one of claims 11-13, wherein, after digesting, at least a portion of the adhesion polymer becomes soluble, and

the method further comprising removing a non-soluble portion of the adhesion polymer by adding a protease to the harvest solution.