What is claimed is:

1. A heteropolymer, comprising:

an acrylamide monomer comprising an azido attachment group to react with a functional group attached to a primer; and

a monomer comprising a stimuli-responsive functional group, wherein the monomer comprising the stimuli-responsive functional group is selected from the group consisting of:

an acrylamide monomer including a terminal pH-responsive functional group selected from the group consisting of a hydroxyl, 1,2,-diol, 1,3-diol protected as an acetal, hemiacetal, or ketal, a tert-butyloxycarbonylamino group, a 9H-fluoren-9-ylmethoxycarbonylamino group, a carboxylate group, a carboxylic acid group, a sulfonate group, and a sulfonic acid group;

a vinyl or acrylate monomer including a terminal pH-responsive functional group selected from the group consisting of a hydroxyl with an acid-labile protecting group, a hydroxyl with a base-labile protecting group, an amino with an acid-labile protecting group, an amino with a base-labile protecting group, a sulfonate group and a sulfonic acid group;

a temperature-responsive N-substituted acrylamide;

an acrylamide, acrylate, or vinyl monomer including a terminal saccharide-responsive functional group;

an acrylamide, acrylate, or vinyl monomer including a terminal nucleophile-responsive functional group; and

an acrylamide, acrylate, or vinyl monomer including a terminal salt-responsive functional group.

2. The heteropolymer of claim 1, wherein the monomer comprising the stimuli-responsive functional group is to undergo modification when exposed to a predetermined stimulus, wherein the modification changes the polarity and/or conformation of the heteropolymer.

3. The heteropolymer of claim 1, further comprising the primer grafted to the attachment group.

4. The heteropolymer of claim 1, wherein the acrylamide monomer is an azido acetamido pentyl acrylamide monomer.

5. The heteropolymer of claim 1, further comprising a second acrylamide monomer.

6. The heteropolymer of claim 1, wherein:

the monomer comprising the stimuli-responsive functional group is the acrylamide, acrylate, or vinyl monomer including the terminal saccharide-responsive functional group; and

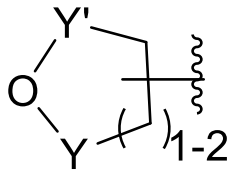
the terminal saccharide-responsive functional group comprises a boronic acid group.

7. The heteropolymer of claim 6, wherein the monomer comprising the stimuli-responsive functional group is 3-(acrylamido)phenylboronic acid.

8. The heteropolymer of claim 1, wherein:

the monomer comprising the stimuli-responsive functional group is the acrylamide, acrylate, or vinyl monomer including the terminal nucleophile-responsive functional group; and

the terminal nucleophile-responsive functional group has the following structure:



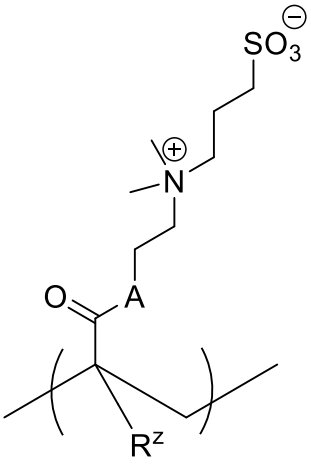
wherein: (a) Y is SO_2 and Y' is CH_2; or (b) Y and Y' are both C(O).

9. The heteropolymer of claim 1, wherein:

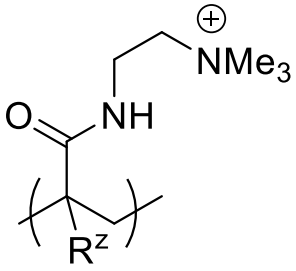
the monomer comprising the stimuli-responsive functional group is the acrylamide, acrylate, or vinyl monomer including the terminal salt-responsive functional group; and

the salt-responsive functional group is a zwitterionic functional group exhibiting antipolyelectrolyte behavior.

10. The heteropolymer of claim 9, wherein the monomer comprising the stimuli-responsive functional group has one of the following structures:

(i) 

wherein A is O or NH and R^z is H or C_{1-4}alkyl; or

(ii) 

wherein R^z is H or C_{1-4}alkyl.

11. The heteropolymer of claim 1, wherein:

the monomer comprising the stimuli-responsive functional group is the temperature-responsive N-substituted acrylamide; and

the temperature-responsive N-substituted acrylamide includes a heat-sensitive hydroxyl or amino protecting group.

12. The heteropolymer of claim 1, wherein:

the monomer comprising the stimuli-responsive functional group is the temperature-responsive N-substituted acrylamide; and

the temperature-responsive N-substituted acrylamide is N-isopropylacrylamide.

13. A method of making a switchable heteropolymer comprising:

selecting a monomer comprising a stimuli-responsive functional group from the group consisting of:

an acrylamide monomer including a terminal pH-responsive functional group selected from the group consisting of a hydroxyl, 1,2,-diol, 1,3-diol protected as an acetal, hemiacetal, or ketal, a tert-butyloxycarbonylamino group, a 9H-fluoren-9-ylmethoxycarbonylamino group, a carboxylate group, a carboxylic acid group, a sulfonate group, and a sulfonic acid group;

a vinyl or acrylate monomer including a terminal pH-responsive functional group selected from the group consisting of a hydroxyl with an acid-labile protecting group, a hydroxyl with a base-labile protecting group, an amino with an acid-labile protecting group, an amino with a base-labile protecting group, a sulfonate group and a sulfonic acid group;

a temperature-responsive N-substituted acrylamide;

an acrylamide, acrylate, or vinyl monomer including a terminal saccharide-responsive functional group;

an acrylamide, acrylate, or vinyl monomer including a terminal nucleophile-responsive functional group; and

an acrylamide, acrylate, or vinyl monomer including a terminal salt-responsive functional group; and

copolymerizing the monomer comprising the stimuli-responsive functional group with an acrylamide monomer comprising an azido attachment group to react with a functional group attached to a primer.

14. The method of claim 13, wherein the acrylamide monomer comprising the attachment group is an azido acetamido pentyl acrylamide monomer.

15. The method of claim 13, further comprising copolymerizing the monomer comprising the stimuli-responsive functional group and the acrylamide monomer comprising the attachment group with a second acrylamide monomer.

16. A flow cell, comprising:

a support; and

the heteropolymer of claim 1 attached to the support.

17. A method of making a flow cell, comprising contacting the heteropolymer of claim 1 with at least a portion of a flow cell support, thereby attaching the heteropolymer to the flow cell support.

18. The method of claim 17, further comprising grafting a primer to the attachment group of the heteropolymer attached to the support.

19. The method of claim 17, further comprising exposing the heteropolymer attached to the flow cell support to a predetermined stimulus.

20. The method of claim 19, further comprising, after the exposing, performing a sequencing operation on the flow cell.