Claims

1. A flow cell, comprising:

a substrate;

a first primer set attached to a first region on the substrate, the first primer set including an un-cleavable first primer and a cleavable second primer; and

a second primer set attached to a second region on the substrate, the second primer set including a cleavable first primer and an un-cleavable second primer;

wherein the second primer set is different than the first primer set.

2. The flow cell as defined in claim 1, wherein:

the first region includes a material having a first functional group; and

the second region includes a material having a second functional group that is different than the first functional group.

3. The flow cell as defined in claim 1, further comprising a gap separating the first primer set from the second primer set.

4. The flow cell as defined in claim 1, wherein:

the substrate includes depressions separated by interstitial regions; and

each of the depressions includes:

the first region located at a first portion; and

the second region located at a second portion.

5. The flow cell as defined in claim 4, further comprising a gap separating the first region from the second region.

6. The flow cell as defined in claim 4, wherein the first region and the second region partially overlap.

7. The flow cell as defined in claim 4, wherein the first and second portions have different depths.

8. The flow cell as defined in claim 4, wherein the first and second regions are different blocks of a block co-polymer.

9. The flow cell as defined in claim 1, wherein:

the substrate includes depressions separated by interstitial regions;

each of the depressions includes the first region; and

the second region is located on at least some of the interstitial regions.

10. The flow cell as defined in claim 1, wherein:

the first region includes a first polymer and the first primer set is grafted to the first polymer; and

the second region includes a second polymer and the second primer set is grafted to the second polymer.

11. The flow cell as defined in claim 10, wherein the flow cell further comprises a protective coating on the first primer set and on the first polymer.

12. The flow cell as defined in claim 10, wherein:

the first polymer is a first layer on the substrate;

the second polymer is a second layer on the first layer;

the flow cell further comprises:

a passivation resin on the second layer; and

features defined in the passivation resin, the second polymer and the first polymer; and

each of the first and second primer sets is exposed at each of the features.

13. The flow cell as defined in claim 1, wherein:

the substrate includes depressions separated by interstitial regions;

each of the depressions includes:

a first portion where the first region is located; and

a second portion; and

the flow cell further comprises a bead located in the second portion, wherein the second region is at a surface of the bead.

14. The flow cell as defined in claim 1, wherein the cleavable first primer includes a first cleavage site, the cleavable second primer includes a second cleavage site, and the first and second cleavage sites are of an identical type.

15. The flow cell as defined in claim 14, wherein:

each of the un-cleavable first primer, the cleavable second primer, the cleavable first primer, and the cleavable second primer includes a respective linker;

the first cleavage site of the first cleavable primer is located along its linker; and

the second cleavage site of the second cleavable primer is located along its linker.

16. The flow cell as defined in claim 1, wherein the cleavable first primer includes a first cleavage site, the cleavable second primer includes a second cleavage site, and the first and second cleavage sites are of a different type.

17. The flow cell as defined in claim 16, wherein:

each of the un-cleavable first primer, the cleavable second primer, the cleavable first primer, and the cleavable second primer includes a respective linker;

the first cleavage site of the first cleavable primer is located along its linker; and

the second cleavage site of the second cleavable primer is located along its linker.

18. The flow cell as defined in claim 1, wherein:

the first primer set is attached to a first support structure;

the first region is a first capture site that is attached to the first support structure;

the second primer set is attached to a second support structure that is different than the first support structure; and

the second region is a second capture site that is attached to the second support structure.

19. A flow cell, comprising:

a first substrate;

a first primer set attached to the first substrate, the first primer set including an un-cleavable first primer and a cleavable second primer;

a second substrate opposed to the first substrate; and

a second primer set attached to the second substrate, the second primer set including a cleavable first primer and an un-cleavable second primer;

wherein the second primer set is different than the first primer set.

20. A kit, comprising:

a flow cell including:

a substrate including depressions separated by interstitial regions;

a first polymer layer in each of the depressions, wherein some functional groups of the first polymer layer are capped;

a first primer set attached to other functional groups of first polymer layer in each of the depressions; and

a second polymer layer on the interstitial regions; and

a priming fluid including:

a fluid carrier; and

a second primer set that is different from the first primer set;

wherein:

the first primer set includes an un-cleavable first primer and a cleavable second primer; and

the second primer set includes a cleavable first primer and an un-cleavable second primer.

21. A method, comprising:

introducing a template fluid to a flow cell including:

a substrate including depressions separated by interstitial regions;

a first polymer layer in each of the depressions, wherein exposed functional groups of the first polymer layer are capped;

a first primer set attached to the first polymer layer in each of the depressions, the first primer set including a cleavable first primer and an un-cleavable second primer;

and

a second polymer layer on the interstitial regions;

whereby a template from the template fluid is amplified to form a cluster in at least some of the depressions;

introducing a priming fluid, comprising a second primer set including an un-cleavable first primer and a cleavable second primer, to the flow cell, whereby the un-cleavable first primer and the cleavable second primer graft to the second polymer layer and wherein the second primer set is different than the first primer set; and

initiating bridge amplification from the cluster to the un-cleavable first primer and a cleavable second primer, thereby forming a second cluster on at least some of the interstitial regions.

22. A method, comprising:

introducing a template fluid to a flow cell including:

a substrate including depressions separated by interstitial regions;

a first polymer layer in each of the depressions;

a first primer set attached to the first polymer layer, the first primer set including a cleavable first primer and an un-cleavable second primer;

an optional protective coating layer on the first polymer layer and on the first primer set;

a second polymer layer on the interstitial regions; and

a second primer set attached to the second polymer layer, the second primer set including an un-cleavable first primer and a cleavable second primer, wherein the second primer set is different than the first primer set;

whereby a template from the template fluid is amplified to form a cluster in at least some of the depressions and on at least some of the interstitial regions; and

cleaving the cleavable first primer and the cleavable second primer.