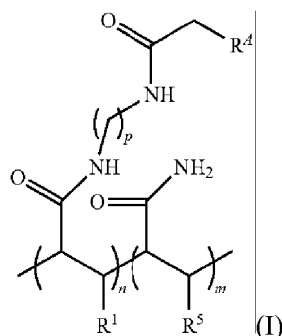


What is claimed is:

1. An array, comprising:
a support comprising a plurality of discrete wells;
a gel material positioned in each of the plurality of discrete wells; and
a quality control tracer grafted to the gel material in each of the plurality of discrete wells;
wherein the quality control tracer comprises (a) a cleavable nucleotide sequence comprising a
cleavage site and (b) a detectable label.
2. The array of claim 1, wherein the cleavable nucleotide sequence comprises a non-reactive
nucleotide sequence.
3. The array of claim 1 or claim 2, wherein the cleavable nucleotide sequence comprises a
grafted region with a first end and a second end, where the first end is grafted to the gel material
and the second end is linked to a cleavable region that is linked to the detectable label and
comprises the cleavage site.
4. The array of claim 3, wherein the grafted region comprises a non-reactive nucleotide
sequence.
5. The array of claim 3, wherein the grafted region comprises a primer nucleotide sequence.
6. The array of any one of claims 3-5, wherein the detectable label is attached to the cleavable
nucleotide sequence at the cleavage site or at a position in the cleavable region that is distal to
the cleavage site.
7. The array of any of the preceding claims, wherein the cleavage site comprises an
enzymatically cleavable nucleobase.
8. The array of claim 7, wherein the enzymatically cleavable nucleobase comprises an excision
site.

9. The array of claim 7, wherein the enzymatically cleavable nucleobase is susceptible to cleavage by reaction with a glycosylase and an endonuclease or with an exonuclease.
10. The array of claim 9, wherein the cleavable nucleotide sequence is grafted to the gel material at its 5' end.
11. The array of claim 10, wherein the detectable label is attached at or near the 3' end of the cleavable nucleotide sequence.
12. The array of claim 11, wherein the detectable label is cleavable by reaction of the quality control tracer with the exonuclease.
13. The array of claim 11, wherein the detectable label is cleavable by reaction of the quality control tracer with the glycosylase and the endonuclease.
14. The array of any one of claims 1-6, wherein the cleavage site comprises a chemically cleavable linker.
15. The array of claim 14, wherein the chemically cleavable linker comprises a vicinal diol, a disulfide, a silane, an azobenzene, a photocleavable group, or an azido.
16. The array of any one of claims 1-5 or 7-15, further comprising an unlabeled primer comprising a primer nucleotide sequence grafted to the gel material in each of the plurality of discrete wells, wherein the quality control tracer and the unlabeled primer are present in a predetermined ratio.
17. The array of any one of the preceding claims, wherein the gel material comprises a polymer of Formula (I):



wherein:

R^1 is H or optionally substituted alkyl;

R^4 is selected from the group consisting of azido, optionally substituted amino, optionally substituted alkenyl, optionally substituted hydrazone, optionally substituted hydrazine, carboxyl, hydroxy, optionally substituted tetrazole, optionally substituted tetrazine, nitrile oxide, nitron, and thiol; R^5 is selected from the group consisting of H and optionally substituted alkyl;

each of the $-(CH_2)_p-$ can be optionally substituted;

p is an integer in the range of 1 to 50;

n is an integer in the range of 1 to 50,000; and

m is an integer in the range of 1 to 100,000.

18. The array of claim 17, wherein the gel material comprises PAZAM.

19. The array of any one of the preceding claims, wherein the detectable label is a fluorescent label.

20. The array of claim 19, wherein the fluorescent label is selected from the group consisting of: a sulfonyl chloride dye, cyanine dyes, a red wavelength dye, a fluorescent dye, derivatives of fluorescein, xanthene fluorophores, and an indocarbocyanine dye.

21. A method of determining the density, the distribution, or the density and the distribution of a primer nucleotide sequence grafted to a support comprising:

providing a support comprising a plurality of discrete wells and a gel material positioned in each of the plurality of discrete wells and a quality control tracer and the primer nucleotide sequence grafted to the gel material each of the plurality of discrete wells;
wherein the quality control tracer comprises (a) a cleavable nucleotide sequence comprising a cleavage site and (b) a detectable label; and
detecting a signal from the detectable label;
determining the density and/or distribution of the quality control tracer based at least in part on the signal from the detectable label; and
determining the density and/or distribution of the grafted primer nucleotide sequence based at least in part on the determined density and/or distribution of the quality control tracer.

22. The method of claim 21, further comprising grafting the quality control tracer to the gel material.

23. The method of claim 22, wherein the primer nucleotide sequence is grafted to the gel material, either before or at the same time as the grafting of the quality control tracer, and prior to the detecting step.

24. The method of any one of claims 21-23, wherein the quality control tracer comprises a non-reactive nucleotide sequence.

25. The method of any one of claims 21-23, wherein the quality control tracer comprises the primer nucleotide sequence and the grafting of the quality control tracer also serves to graft the primer nucleotide sequence to the gel material.

26. The method of any one of claims 21-25, wherein the cleavable nucleotide sequence comprises a grafted region with a first end and a second end, where the first end is grafted to the gel material and the second end is linked to a cleavable region comprising the cleavage site, wherein the second end of the grafted region is linked to the cleavage site of the cleavable region.

27. The method of claim 26, wherein the grafted region comprises a non-reactive nucleotide sequence.
28. The method of claim 26, wherein the grafted region comprises a primer nucleotide sequence.
29. The method of any one of claims 26-28, wherein the detectable label is attached to the cleavable nucleotide sequence at the cleavage site or at a position in the cleavable region that is distal to the cleavage site.
30. The method of any one of claims 21-29, wherein the quality control tracer and the primer nucleotide sequence are grafted to the gel material in a predetermined ratio and the determining of the density and/or distribution of the primer nucleotide sequence is based on the detected signal and the predetermined ratio.
30. The method of any one of claims 21-29, further comprising removing the detectable label from the quality control tracer by a cleavage reaction at the cleavage site.
31. The method of claim 30, wherein the removing is accomplished by enzymatic cleavage or chemical cleavage.
32. The method of any one of claims 21-31, wherein the detectable label is a fluorescent label and the detected signal is fluorescence.
33. A method, comprising:
grafting a quality control tracer to a gel material in a well on a support, the quality control tracer being selected from the group consisting of:
a cleavable nucleotide sequence tagged, at its 3' end, with a fluorescent label; and
a non-reactive nucleotide sequence with the fluorescent label attached to a cleavable nucleobase;
detecting the quality control tracer using fluorescence; and

based at least in part on the fluorescence, determining a density, or a distribution, or the density and the distribution, of a primer nucleotide sequence grafted to the gel material.

34. The method of claim 33, wherein the quality control tracer is the cleavable nucleotide sequence, and wherein the cleavable nucleotide sequence is the primer nucleotide sequence.

35. The method of claim 34, further comprising cleaving the fluorescent label from the primer nucleotide sequence after the density, or the distribution, or the density and the distribution, of the primer nucleotide sequence is determined.

36. The method of claim 34 or claim 35, wherein:
the primer nucleotide sequence is untagged;
prior to the detecting, the method further comprises grafting the primer nucleotide sequence to the gel material, wherein the cleavable nucleotide sequence and the primer nucleotide sequence are present in a predetermined ratio; and
the determining of the density, or the distribution, or the density and the distribution, of the primer nucleotide sequence is based on the fluorescence and the predetermined ratio.

37. The method of claim 36, further comprising cleaving the fluorescent label from the cleavable nucleotide sequence, wherein the cleaving is accomplished by enzymatic cleavage or chemical cleavage.

38. The method of claim 33, wherein:
the quality control tracer is the non-reactive nucleotide sequence;
the primer nucleotide sequence is untagged;
prior to the detecting, the method further comprises grafting the primer nucleotide sequence to the gel material, wherein the non-reactive nucleotide sequence and the primer nucleotide sequence are present in a predetermined ratio; and
the determining of the density, or the distribution, or the density and the distribution, of the primer nucleotide sequence is based on the fluorescence and the predetermined ratio.

39. The method of claim 38, further comprising removing the fluorescent label from the cleavable nucleobase of the non-reactive nucleotide sequence using an exonuclease.
40. A method of co-grafting a quality control tracer and a primer nucleotide sequence to an array, comprising:
combining the quality control tracer and the primer nucleotide sequence at a predetermined ratio to form a grafting mix;
wherein the quality control tracer comprises (a) a cleavable nucleotide sequence comprising a cleavage site and (b) a detectable label; and
exposing the grafting mix to a gel material in a well on a support; and
incubating the grafting mix and the gel material, thereby co-grafting the quality control tracer and the primer nucleotide sequence to the gel material.
41. The method of claim 40, wherein the quality control tracer is:
a cleavable nucleotide sequence tagged, at its 3' end, with a fluorescent label; or
a non-reactive nucleotide sequence with the fluorescent label attached to a cleavable nucleobase.
42. The method of claim 40 or claim 41, further comprising:
detecting the grafted quality control tracer by detecting a signal from the detectable label; and
based at least in part on the detected signal and the predetermined ratio, determining a density, or a distribution, or the density and the distribution, of the primer nucleotide sequence grafted to the gel material.
43. The method of any one of claims 40-42, further comprising removing the detectable label from the cleavable nucleotide sequence via enzymatic cleavage or chemical cleavage at the cleavage site.
44. The method of any one of claims 40-43, wherein the cleavable nucleotide sequence includes a linker molecule attaching the detectable label.

45. The method of claim 44, wherein the linker molecule comprises a diol, a disulfide, a silane, an azobenzene, a photocleavable group, or an azido.
46. The method of any one of claims 40-43, wherein the cleavage site comprises a cleavable nucleobase.
47. The method of claim 46, further comprising removing the detectable label by reaction of the cleavable nucleobase with a glycosylase and an endonuclease or with an exonuclease.
48. The method of any one of claims 40 or 42-47, wherein the detectable label is a fluorescent label.
49. A method of grafting a quality control tracer to an array, comprising grafting a quality control tracer to a gel material in a well on a support;
wherein the quality control tracer comprises (a) a cleavable nucleotide sequence comprising a cleavage site and (b) a detectable label; and
wherein the cleavable nucleotide sequence comprises a grafted region with a first end and a second end, where the first end is grafted to the gel material and the second end is linked to a cleavable region that is linked to the detectable label and comprises the cleavage site.
50. The method of claim 49, wherein the grafted region comprises a primer nucleotide sequence.
51. The method of claim 50, further comprising cleaving the quality control tracer at the cleavage site, thereby removing the detectable label and providing an unlabeled primer nucleotide sequence grafted to the gel material.
52. The method of claim 49, wherein the grafted region comprises a non-reactive nucleotide sequence.
53. The method of claim 52, further comprising grafting a primer comprising a primer nucleotide sequence to the gel material in a pre-determined ration with the quality control tracer.

54. The method of claim 53, further comprising removing the detectable label from the quality control tracer by cleavage reaction at the cleavage site.

55. A grafting mix composition, comprising:

(1) a primer comprising a primer nucleotide sequence and

(2) a quality control tracer,

wherein the quality control tracer comprises (a) a cleavable nucleotide sequence comprising a cleavage site and (b) a detectable label; and

wherein the primer and the quality control tracer are present in the composition in a predetermined ratio.