

CLAIMS

1. A method of amplifying a target nucleic acid sequence, the method comprising:
seeding double-stranded DNA (dsDNA) onto a flow cell that comprises a first portion that comprises a protein, and a second portion that comprises a plurality of lawn primers immobilised on the flow cell,
wherein the dsDNA comprises a target nucleic acid sequence and a complementary nucleic acid sequence, and wherein the dsDNA is connected to a ligand that causes an interaction between the ligand and the protein;
after interaction between the ligand and the protein, denaturing the dsDNA to remove the complementary nucleic acid sequence; and
amplifying the target nucleic acid sequence using the lawn primers.
2. The method of claim 1, wherein the plurality of lawn primers are capped on one end with positive charges.
3. The method of claim 2, wherein the positive charges cause diffusion of the dsDNA towards the first portion of the flow cell that comprises the protein.
4. The method of claim 2, further comprising removing the positive charges from the lawn primers after interaction between the ligand and the protein.
5. The method of claim 4, wherein the positive charges are removed through cleavage.
6. The method of claim 4, wherein the positive charges are removed through melt-off.
7. The method of claim 1, wherein the protein is streptavidin, and wherein the ligand is biotin.
8. The method of claim 1, wherein the lawn primers comprise P5 lawn primers.
9. The method of claim 1, wherein the lawn primers comprise P7 lawn primers.
10. The method of claim 1, wherein the lawn primers comprise P5 and P7 lawn primers.
11. The method of claim 1, wherein the flow cell does not include any wells on its surface.
12. The method of claim 1, wherein the flow cell comprises wells on its surface.

13. The method of claim 12, wherein the wells comprise small wells within large wells.
14. The method of claim 1, wherein seeding the dsDNA onto the flow cell inhibits additional seeding events onto the flow cell.
15. The method of claim 1, wherein the first portion of the flow cell is circular.
16. The method of claim 15, wherein the first portion of the flow cell comprises a diameter that is between 80nm and 100nm.
17. The method of claim 15, wherein the first portion of the flow cell is a circular pad.
18. A method of seeding double-stranded DNA (dsDNA) onto a flow cell, the method comprising:
 - seeding the dsDNA onto the flow cell that comprises a first portion that comprises a first biological molecule and a second portion that comprises a plurality of lawn primers immobilised on the flow cell,
 - wherein the dsDNA comprises a target nucleic acid sequence, and wherein the dsDNA is connected to a second biological molecule that results in an interaction between the second biological molecule and the first biological molecule.
19. A flow cell, comprising:
 - a surface, comprising
 - a first portion comprising a pad that comprises a protein; and
 - a second portion that comprises at least one of P5 lawn primers and P7 lawn primers.