

CLAIMS

1. A method of single cell analysis, comprising:
 - a) contacting a cell with a reporter agent comprising a reporter nucleic acid molecule to provide a labelled cell, wherein the reporter nucleic acid molecule comprises a reporter sequence corresponding to the reporter agent, wherein the labelled cell comprises a complex coupled to a surface of the cell, and wherein the complex comprises (i) a capture agent, (ii) a secreted analyte, and (iii) the reporter agent;
 - b) partitioning the labelled cell in a partition, wherein the partition comprises a plurality of barcode nucleic acid molecules which comprise a plurality of partition barcode sequences; and
 - c) in the partition, generating a barcoded nucleic acid molecule from a barcode nucleic acid molecule of the plurality of barcode nucleic acid molecules and the reporter nucleic acid molecule, wherein the barcoded nucleic acid molecule comprises the reporter sequence or a complement thereof and a partition barcode sequence or a complement thereof.
2. The method of claim 1, wherein said secreted analyte is a secreted protein.
3. The method of claim 1 or 2, wherein the capture agent is configured to couple to a cell surface molecule.
4. The method of claim 3, wherein said cell surface molecule is a cell surface protein.
5. The method of any of claims 1-4, wherein the capture agent is configured to couple to the secreted analyte.
6. The method of claim 4, wherein said capture agent is configured to couple to both the cell surface protein and said secreted analyte.
7. The method of any of claims 1-6, wherein said capture agent is a first protein binding agent.
8. The method of any of claims 1-7, wherein the reporter agent is configured to couple to the secreted analyte.
9. The method of claim 7 or 8, wherein said reporter agent is a second protein binding agent.
10. The method of any of claims 1-9, wherein said reporter nucleic acid molecule further comprises a sequence configured to couple to the barcode nucleic acid molecule.
11. The method of any of claims 1-10, wherein said labelled cell further comprises a second reporter agent comprising a second reporter nucleic acid molecule.

12. The method of claim 11, wherein said second reporter agent is configured to couple to a second cell surface protein of the cell.
13. The method of claim 11 or 12, wherein said second reporter nucleic acid molecule comprises a second reporter sequence corresponding to the second reporter agent.
14. The method of claim any of claims 1-13, wherein the partition further comprises a second barcode nucleic acid molecule of a plurality of second barcode nucleic acid molecules.
15. The method of claim 14, wherein said second reporter nucleic acid molecule comprises a second sequence configured to couple to the second barcode nucleic acid molecule.
16. The method of claim 14 or 15, wherein step (c) further comprises generating a second barcoded nucleic acid molecule from a second barcode nucleic acid molecule from the plurality of second barcode nucleic acid molecules and the second reporter nucleic acid molecule, wherein the second barcoded nucleic acid molecule comprises sequences from the second reporter nucleic acid molecule and the second barcode nucleic acid molecule, or complements thereof.
17. The method of any of claims 1-16, wherein said labelled cell further comprises a plurality of nucleic acid analytes, wherein a nucleic acid analyte of said plurality of nucleic acid analytes comprises a nucleic acid analyte sequence.
18. The method of any of claims 1-17, wherein the partition further comprises a plurality of third barcode nucleic acid molecules.
19. The method of claim 18, wherein a third barcode nucleic acid molecule of said plurality of third barcode nucleic acid molecules comprises a third sequence configured to couple to the nucleic acid analyte sequence.
20. The method of claim 18 or 19, wherein step (c) further comprises generating a third barcoded nucleic acid molecule from a third barcode nucleic acid molecule from the plurality of third barcode nucleic acid molecules and the nucleic acid analyte, wherein the third barcoded nucleic acid molecule comprises sequences from the nucleic acid analyte and the third barcode nucleic acid molecule, or complements thereof.
21. The method of any of claims 1-20, wherein said partition comprises a support that comprises the plurality of barcode nucleic acid molecules.
22. The method of claim 21, wherein said support is a bead.
23. The method of claim 22, wherein said bead is a gel bead.
24. The method of any of claims 21-23, wherein said plurality of barcode nucleic acid molecules are releasably attached to the support.

25. The method of any of claims 1-24, wherein the partition is from a plurality of partitions.
26. The method of claim 25, wherein the partition is a droplet or a microwell.
27. A method of single cell analysis, comprising:
- a) contacting a cell bead with a reporter agent comprising a reporter nucleic acid molecule to provide a labelled cell bead, wherein the cell bead comprises a cell in a matrix, wherein the reporter nucleic acid molecule comprises a reporter sequence corresponding to the reporter agent, wherein the labelled cell bead comprises a complex in or on the cell bead, and wherein the complex comprises (i) a capture agent, (ii) a secreted analyte, and (iii) the reporter agent;
 - b) partitioning the labelled cell bead in a partition, wherein the partition comprises a plurality of barcode nucleic acid molecules which comprise a plurality of partition barcode sequences; and
 - c) in the partition, generating a barcoded nucleic acid molecule from a barcode nucleic acid molecule of the plurality of barcode nucleic acid molecules and the reporter nucleic acid molecule, wherein the barcoded nucleic acid molecule comprises the reporter sequence or a complement thereof and a partition barcode sequence or a complement thereof.
28. The method of claim 27, wherein said secreted analyte is a secreted protein.
29. The method of claim 27 or 28, wherein the capture agent is configured to couple to the matrix of the cell bead.
30. The method of claim 29, wherein said matrix is a degradable polymer matrix.
31. The method of any of claims 27-30, wherein the capture agent is configured to couple to the secreted analyte.
32. The method of claim 30, wherein said capture agent is configured to couple to both the matrix and said secreted analyte.
33. The method of any of claims 27-32, wherein said capture agent is a first protein binding agent.
34. The method of any of claims 27-33, wherein the reporter agent is configured to couple to the secreted analyte.
35. The method of claim 33 or 34, wherein said reporter agent is a second protein binding agent.
36. The method of any of claims 27-35, wherein said reporter nucleic acid molecule further comprises a sequence configured to couple to the barcode nucleic acid molecule.

37. The method of any of claims 27-36, wherein said cell or said labelled cell bead further comprises a second reporter agent comprising a second reporter nucleic acid molecule.
38. The method of claim 37, wherein said second reporter agent is configured to couple to a cell surface protein of the cell.
39. The method of claim 37 or 38, wherein said second reporter nucleic acid molecule comprises a second reporter sequence corresponding to the second reporter agent.
40. The method of claim any of claims 27-39, wherein the partition further comprises a second barcode nucleic acid molecule of a plurality of second barcode nucleic acid molecules.
41. The method of claim 40, wherein said second reporter nucleic acid molecule comprises a second sequence configured to couple to the second barcode nucleic acid molecule.
42. The method of claim 40 or 41, wherein step (c) further comprises generating a second barcoded nucleic acid molecule from a second barcode nucleic acid molecule from the plurality of second barcode nucleic acid molecules and the second reporter nucleic acid molecule, wherein the second barcoded nucleic acid molecule comprises sequences from the second reporter nucleic acid molecule and the second barcode nucleic acid molecule, or complements thereof.
43. The method of any of claims 27-42, wherein said cell further comprises a plurality of nucleic acid analytes, wherein a nucleic acid analyte of said plurality of nucleic acid analytes comprises a nucleic acid analyte sequence.
44. The method of any of claims 27-43, wherein the partition further comprises a plurality of third barcode nucleic acid molecules.
45. The method of claim 44, wherein a third barcode nucleic acid molecule of said plurality of third barcode nucleic acid molecules comprises a third sequence configured to couple to the nucleic acid analyte sequence.
46. The method of claim 44 or 45, wherein step (c) further comprises generating a third barcoded nucleic acid molecule from a third barcode nucleic acid molecule from the plurality of third barcode nucleic acid molecules and the nucleic acid analyte, wherein the third barcoded nucleic acid molecule comprises sequences from the nucleic acid analyte and the third barcode nucleic acid molecule, or complements thereof.
47. The method of any of claims 27-46, wherein said partition comprises a support that comprises the plurality of barcode nucleic acid molecules.
48. The method of claim 47, wherein said support is a bead.
49. The method of claim 48, wherein said bead is a gel bead.

50. The method of any of claims 47-49, wherein said plurality of barcode nucleic acid molecules are releasably attached to the support.
51. The method of any of claims 27-50, wherein the partition is from a plurality of partitions.
52. The method of claim 51, wherein the partition is a droplet or a microwell.