

Claims:

1. A method of detecting a target analyte in a single cell, the method comprising:
 - a) isolating the single cell;
 - b) incubating the single cell in a lysing buffer comprising a detergent present at a concentration below the critical micelle concentration to obtain a cell lysate;
 - c) incubating the cell lysate with two or more proximity extension probes in a binding reaction at an incubation temperature from about 15°C to about 50°C for a length of time from about 5 minutes to about 6 hours under conditions where the proximity extension probes bind to the target analyte, if present, in the cell lysate;
 - d) incubating the binding reaction with an extension mix that comprises a polymerase, wherein hybridized oligonucleotide components of the proximity extension probe are extended by the polymerase to produce extension products;
 - e) detecting the extension products,wherein at least one of the proximity extension probes comprises an antibody as an analyte binding component, and
wherein the concentration of the proximity probe in the binding reaction ranges from about 10 pM to about 100 pM.

2. A method of detecting a target analyte in a single cell, the method comprising:
 - a) isolating the single cell;
 - b) incubating the single cell in a lysing buffer comprising a detergent present at a concentration below the critical micelle concentration to obtain a cell lysate;
 - c) incubating the cell lysate with two or more proximity extension probes in a binding reaction at an incubation temperature from about 15°C to about 50°C for a length of time from about 5 minutes to about 6 hours under conditions where the proximity extension probes bind to the target analyte, if present, in the cell lysate;
 - d) incubating the binding reaction with an extension mix that comprises a polymerase, wherein hybridized oligonucleotide components of the proximity extension probe are extended by the polymerase to produce extension products;
 - e) detecting the extension products,wherein at least one of the proximity extension probes comprises an antibody as an analyte binding component, and
wherein the concentration of the proximity probe in the binding reaction ranges from about 20 pM to about 200 nM.

3. A method of detecting a target analyte in a single cell, the method comprising:
 - a) isolating the single cell;

b) incubating the single cell in a lysing buffer comprising a detergent present at a concentration below the critical micelle concentration to obtain a cell lysate;

c) incubating the cell lysate with two or more proximity extension probes in a binding reaction at an incubation temperature from about 15°C to about 50°C for a length of time from about 5 minutes to about 6 hours under conditions where the proximity extension probes bind to the target analyte, if present, in the cell lysate;

d) incubating the binding reaction with an extension mix that comprises a polymerase, wherein hybridized oligonucleotide components of the proximity extension probe are extended by the polymerase to produce extension products;

e) detecting the extension products,
wherein each of the proximity extension probes comprises an antibody as an analyte binding component, and
wherein the binding affinity of each proximity probe is in the binding reaction ranges from about 10 pM to about 100 pM.

4. A method of detecting a target analyte in a single cell, the method comprising:

a) isolating the single cell;

b) incubating the single cell in a lysing buffer comprising a detergent present at a concentration below the critical micelle concentration to obtain a cell lysate;

c) incubating the cell lysate with two or more proximity extension probes in a binding reaction at an incubation temperature from about 15°C to about 50°C for a length of time from about 5 minutes to about 6 hours under conditions where the proximity extension probes bind to the target analyte, if present, in the cell lysate;

d) incubating the binding reaction with an extension mix that comprises a polymerase, wherein hybridized oligonucleotide components of the proximity extension probe are extended by the polymerase to produce extension products;

e) detecting the extension products,
wherein each of the proximity extension probes comprises an antibody as an analyte binding component, and

wherein the binding affinity of each proximity probe is in the binding reaction ranges from about 20 pM to about 200 nM.