

ABSTRACT OF THE INVENTION

In embodiments of the present invention, a system and method of cytometry may include presenting a single sperm cell to at least one laser source configured to deliver light to the sperm cell in order to induce bond vibrations in the sperm cell DNA, and detecting the signature of the bond vibrations. The bond vibration signature is used to calculate a DNA content carried by the sperm cell which is used to identify the sperm cell as carrying an X-chromosome or Y-chromosome. Another system and method may include flowing cells past at least one QCL source one-by-one using a fluid handling system, delivering QCL light to a single cell to induce resonant mid-IR absorption by one or more analytes of the cell, and detecting, using a mid-infrared detection facility, the transmitted mid-infrared wavelength light, wherein the transmitted mid-infrared wavelength light is used to identify a cell characteristic.

FIGURE 1