What is claimed is:

1. A method of controlling a needle actuator to interact with a cell, the method comprising:

providing an actuator comprising a tower, a stage and a needle, wherein the needle is mounted on the stage;

applying an electrostatic potential between the tower and the stage so as to move the stage closer to the tower to retract the needle;

moving the actuator towards the cell;

reducing the electrostatic potential so as to allow the stage and needle to move towards the cell;

applying calibration data to detect when the needle has pierced the cell; and

reducing the electrostatic potential further once it has been detected that the needle has pierced the cell.

2. The method of Claim 1, wherein the cell is a biological cell.

3. The method of Claim 1, wherein the needle is a micro-needle and the stage is a micro-stage.

4. The method of Claim 1, wherein the cell is held by a cell trap.

5. The method of Claim 1, wherein the reducing of the electrostatic potential further is performed while monitoring a fluctuation in voltage versus displacement values that indicates that the needle has pierced the cell.

6. The method of Claim 1, wherein the calibration data comprises data defining voltages for displacements stored against types of cells.

7. The method of Claim 1, wherein the actuator is provided on an array of actuators, each interacting with an individual cell of a plurality of cells.

8. The method of Claim 4, wherein the cell trap comprises a plurality of microchambers, each microchamber arranged to hold a cell.

9. The method of Claim 5, wherein a laser interferometer is used to indicate that the needle has pierced the cell.

10. A method of generating calibration data for target voltage potentials associated with cell-type data, the method comprising:

providing a calibration apparatus comprising a manipulator and a cell trap, the manipulator comprising a tower, a stage, and a needle, wherein the needle is mounted on the stage;

identifying a cell type to be calibrated;

applying a voltage, thereby providing a change in electrostatic force between the tower and the stage so as to pull the stage towards the tower in a retracted position;

moving the manipulator to within a defined range of the cell trap configured to house the cell type;

changing the voltage to allow the stage and mounted needle to be forced away from the tower and the retracted position while measuring the displacement of the stage;

determining when the needle has reached a target region; and

recording actuation data for use in cell injection for the identified cell type.

11. The method of Claim 10, further comprising:

receiving a user input of the cell type to a controller provided on the calibration apparatus.

12. The method of Claim 10, further comprising:

determining if the manipulator is within the defined range using a camera provided on the calibration apparatus when moving the manipulator to within the defined range of the cell trap.

13. The method of Claim 12, wherein the camera on the calibration apparatus is programmed to determine if the manipulator is within a defined range of a periphery of the cell trap.

14. The method of Claim 10, wherein measuring the displacement of the stage is performed by a laser interferometer provided in the calibration apparatus.

15. The method of Claim 10, wherein the actuation data is selected from a group consisting of a record target voltage, a target vertical actuation displacement, a point of penetration, a point of poking, a Voltage-Displacement characteristic curve distortion, and combinations thereof.

16. A non-transitory computer-readable medium in which a program is stored for causing a computer to perform a method for generating calibration data for target voltage potentials associated with cell-type data, the method comprising:

providing a calibration apparatus comprising a manipulator and a cell trap, the manipulator comprising a tower, a stage, and a needle, wherein the needle is mounted on the stage;

identifying a cell type to be calibrated;

providing an electrostatic force between the tower and the stage so as to pull the stage towards the tower in a retracted position;

moving the manipulator to within a defined range of the cell trap configured to house the cell type;

changing the electrostatic force to allow the stage and mounted needle to be forced away from the tower and the retracted position while measuring the displacement of the stage;

determining when the needle has reached a target region; and

recording actuation data for use in cell injection for the identified cell type.

17. The non-transitory computer-readable medium of Claim 16, further comprising:

receiving a user input of the cell type to a controller provided on the calibration apparatus.

18. The non-transitory computer-readable medium of Claim 16, further comprising:

determining if the manipulator is within the defined range using a camera provided on the calibration apparatus when moving the manipulator to within the defined range of the cell trap.

19. The non-transitory computer-readable medium of Claim 18, wherein the camera on the calibration apparatus is programmed to determine if the manipulator is within a defined range of a periphery of the cell trap.

20. The non-transitory computer-readable medium of Claim 16, wherein measuring the displacement of the stage is performed by a laser interferometer provided in the calibration apparatus.

21. The non-transitory computer-readable medium of Claim 16, wherein the actuation data is selected from a group consisting of a record target voltage, a target vertical actuation displacement, a point of penetration, a point of poking, a Voltage-Displacement characteristic curve distortion, and combinations thereof.

22. A method for controlling a cell injection device, the method comprising:

providing an apparatus comprising a cell injection device, a cell trap, and a storage device, the cell injection device comprising a tower, a stage, and a needle, wherein the needle is mounted on the stage;

identifying a cell type to be injected;

retrieving actuation data from the storage device;

applying a voltage, thereby providing an electrostatic force between the tower and the stage so as to pull the stage towards the tower in a retracted position;

moving the cell injection device to within a defined range of the cell trap configured to house the cell type;

applying a varying target actuation voltage based on retrieved actuation data to allow the stage and mounted needle to be forced away from the tower and the retracted position;

determining when the needle has reached a target region; and

adjusting the voltage to move the needle towards the retracted position.

23. The method of Claim 22, further comprising:

receiving a user input of the cell type to a controller provided on the apparatus.

24. The method of Claim 22, further comprising:

determining if the cell injection device is within the defined range using a camera provided on the apparatus when moving the cell injection device to within the defined range of the cell trap.

25. The method of Claim 24, wherein the camera on the apparatus is programmed to determine if the injection device is within a defined range of a periphery of the cell trap.

26. The method of Claim 22, wherein the actuation data is selected from a group consisting of a record target voltage, a target vertical actuation displacement, a point of penetration, a point of poking, a Voltage-Displacement characteristic curve distortion, and combinations thereof.

27. A non-transitory computer-readable medium in which a program is stored for causing a computer to perform a method for controlling a cell injection device, the method comprising:

providing an apparatus comprising a cell injection device, a cell trap, and a storage device, the cell injection device comprising a tower, a stage, and a needle, wherein the needle is mounted on the stage;

identifying a cell type to be injected;

retrieving actuation data from the storage device;

providing an electrostatic force between the tower and the stage so as to pull the stage towards the tower in a retracted position;

moving the cell injection device to within a defined range of the cell trap configured to house the cell type;

applying a varying target actuation voltage based on retrieved actuation data to allow the stage and mounted needle to be forced away from the tower and the retracted position;

determining when the needle has reached a target region; and

adjusting the electrostatic force to move the needle towards the retracted position.

28. The non-transitory computer-readable medium of Claim 27, further comprising:

receiving a user input of the cell type to a controller provided on the apparatus.

29. The non-transitory computer-readable medium of Claim 27, further comprising:

determining if the cell injection device is within the defined range using a camera provided on the apparatus when moving the cell injection device to within the defined range of the cell trap.

30. The non-transitory computer-readable medium of Claim 29, wherein the camera on the apparatus is programmed to determine if the injection device is within a defined range of a periphery of the cell trap.

31. The non-transitory computer-readable medium of Claim 27, wherein the actuation data is selected from a group consisting of a record target voltage, a target vertical actuation displacement, a point of penetration, a point of poking, a Voltage-Displacement characteristic curve distortion, and combinations thereof.