Claims

1. A system for measuring electrical characteristics of bioparticles, the system comprising
   - an incubator configured for performing electrochemical measurements in a defined environment,
   - a substrate holder positioned in said incubator and configured for holding a substrate comprising a plurality of wells,
   wherein the system is configured for continuously or regularly measuring electrochemical data,
   the system comprising a processing means programmed for comparing the continuously or regularly measured electrochemical data with reference data and programmed for determining a moment for adding an active compound based on said comparison, characterized in that the processing means is adapted for determining the moment for adding an active compound based on a parameter value derived from a broad-spectrum impedance measurement conducted over a frequency range spanning at least from 100Hz to 50kHz on bioparticles in solution in the well, the impedance data comprising both a magnitude as well as a phase of the impedance.
2. A system according to claim 1, wherein the system furthermore comprises a delivery means for automatically delivering an active compound in the well at the determined addition moment.
3. A system according to any of the previous claims, wherein the system is adapted for measuring impedance data over a frequency span of at least two decades, at least 2 measurement points per decade being recorded.
4. A system according to any of the previous claims, wherein the processing means is adapted for determining the moment for adding an active compound based on a parameter value derived from a broad-spectrum impedance measurement conducted on the bioparticles in the well.
5. A system according to claim 4, wherein the broad-spectrum impedance measurement corresponds with an impedance measurement spanning at least a frequency range of 100 Hz to 50kHz, e.g. at least a frequency range of 10Hz to 80kHz, for example at least a frequency range of 1Hz to 100kHz.
6. A system according to any of the previous claims wherein the system is adapted for measuring impedance data comprising both a magnitude as well as a phase of the impedance.

7. A system according to any of the previous claims, wherein the system is adapted for measuring electrochemical data on bioparticles in solution.
8. A system according to any of the previous claims, wherein the processing means is adapted for deriving information regarding a specific phenomenon.
9. A system according to claim 8, wherein the processing means is a switchable module adapted for deriving information regarding one of the following phenomena : toxicity of a compound for cells, Receptor activation and inhibition such as G Protein Coupled Receptors (GPCRs), Receptor Tyrosine Kinases (RTKs), Ion Channels (ICs), Nuclear Receptors (NRs), the dissection of signal transduction cascades, microbial biofilm formation/inhibition/destruction or viral mode of entry and total viral load.
10. A system according to claim 8 or 9, wherein the processing means is adapted for determining said information regarding said phenomenon, taking into account said determined addition moment for delivering the active compound in the well.
11. A system according to any of the previous claims, wherein said system furthermore comprises an environmental parameter sensor for sensing an environmental parameter in the incubator, the environmental parameter being one or more of a temperature, a humidity, a CO_2 level, an O_2 level, a pH, a salinity, a nutrient concentration, and a degree of illumination.
12. A system according to claim 11, wherein the processing means is adapted for determining said information regarding said phenomenon, taking into account said environmental parameter.
13. A system according to any of the previous claims, the system furthermore comprising
- a plurality of driving and/or read-out circuitries for separately driving and/or reading out different wells or groups of wells through different circuitries,
- an electrical connecting means for connecting said plurality of driving and/or read-out circuitry with different electrodes of individual wells or different groups of wells of the substrate by connecting to their different electrical connection points at a backside of the substrate.
14. A system according to claim 13, wherein the driving and/or read-out circuitries are positioned substantially under the different wells or under the different groups of wells under the substrate, when the substrate is positioned in the substrate holder, such that the electrical circuits can be short and substantially the same for the different wells or different groups of wells.

15. A system according to any of claims 13 to 14, wherein the driving and/or read-out circuits are configured for reading out different well or different groups of wells in parallel in time, i.e. simultaneously.
16. A system according to any of claims 13 to 15, wherein each driving and/or read-out circuit comprise an analog to digital converter and a data acquisition component.
17. A system according to claim 16, wherein the system is adapted for acquiring electrochemical measurement data of a well and processing the data not taking into account calibration data of another well in the substrate.
18. A method for measuring electrical characteristics of bioparticles, the method comprising
- continuously or regularly measuring electrochemical data on the bioparticles in a defined environment,
- comparing the continuously or regularly measured electrochemical data with reference data,
- determining a moment for adding an active compound based on said comparison, and
- adding the active compound on the determined moment,
characterized in that said determining the moment being based on a parameter value derived from a broad-spectrum impedance measurement conducted over a frequency range spanning at least from 100Hz to 50kHz on bioparticles in solution in the well, the impedance data comprising both a magnitude as well as a phase of the impedance.
19. A method according to claim 18, wherein continuously or regularly measuring electrochemical data comprises measuring impedance data over a frequency span of at least two decades, at least 2 measurement points per decade being recorded.
20. A method according to any of claims 18 or 19, wherein determining the moment for adding an active compound is based on a parameter value derived from a broad-spectrum impedance measurement conducted on the bioparticles in the well.
21. A method according to claim 20, wherein the broad-spectrum impedance measurement corresponds with an impedance measurement spanning at least a frequency range of 100 Hz to 50kHz, e.g. at least a frequency range of 10Hz to 80kHz, for example at least a frequency range of 1Hz to 100kHz.
22. A method according to any of claims 18 to 21, wherein measuring electrochemical data comprises measuring impedance data comprising both a magnitude as well as a phase of the impedance.

23. A method according to any of claims 18 to 22, wherein the method comprises deriving information regarding a specific phenomenon.
24. A method according to claim 23, wherein the method comprises deriving information regarding one of the following phenomena: toxicity of a compound for cells, Receptor activation and inhibition such as G Protein Coupled Receptors (GPCRs), Receptor Tyrosine Kinases (RTKs), Ion Channels (ICs), Nuclear Receptors (NRs), the dissection of signal transduction cascades, microbial biofilm formation/inhibition/destruction or viral mode of entry and total viral load.
25. A method according to any of claims 23 to 24, the method comprising determining said information regarding said phenomenon, taking into account said determined addition moment for delivering the active compound in the well.
26. A method according to any of claims 18 to 25, the method comprising sensing an environmental parameter in the incubator, the environmental parameter being one or more of a temperature, a humidity, a CO_2 level, an O_2 level, a pH, a salinity, a nutrient concentration, and a degree of illumination.
27. A method according to claim 26 in as far as dependent on claims 23 or 24, the method comprising determining said information regarding said phenomenon, taking into account said environmental parameter.
28. A method according to any of claims 18 to 27, the method comprising reading out different well or different groups of wells in parallel in time, i.e. simultaneously.
29. A method according to any of claims 18 to 28 for acquiring electrochemical measurement data of a well and for processing the data not taking into account calibration data of another well in the substrate.
30. A computer program product for measuring electrical characteristics of bioparticles, the computer program product being adapted for, when run on a computing means, performing a method according to any of claims 18 to 29.
31. Use of a system according to any of claims 1 to 17 for monitoring growth of adherent cell cultures.
32. Use of a system according to any of claims 1 to 17 for monitoring growth of suspended cell cultures.