

sepsis for this patient is marked and all patterns leading up to that point are relevant to the determination that this patient became septic.

FIG. 39 illustrates a bivariate time course of two particular markers (protein C and C-reactive protein) in the same patient. The change in direction in the center of the graph represents a rapid onset of disease. In this example, a patient rapidly deteriorated and was illustrated as septic in a very particular region of the bivariate space. In this example, the sampling intervals are fairly regular; therefore the length of each line segment represents the rate of change of the biomarkers in this particular space.

What is claimed is:

1. A method for characterizing the probability of a clinical outcome of a subject, comprising:

- a. constructing one or more probability spaces with the aid of a computer processor that executes a program to construct said one or more probability spaces, wherein each probability space is defined by at least three discrete clinical outcomes, each discrete clinical outcome of said at least three discrete clinical outcomes is characterized by a statistical distribution of a set of biological marker(s), wherein the statistical distribution for a given set of biological marker(s) is different from all other statistical distributions for all other sets of biological markers characterizing each of the clinical outcomes within a given probability space, and wherein said given probability space is reflective of said at least three discrete clinical outcomes associated with a medical condition, medical procedure, therapy, clinical trial, drug discovery, or drug development;
- b. receiving, with the aid of a computer, subject data corresponding to the set of biological marker(s) for each discrete clinical outcome within the given probability space;
- c. calculating, with the aid of a computer processor that executes a program to determine the position of the subject data in the given probability space, the position of said subject data in said given probability space based on where said subject data falls within each statistical distribution of said set of biological marker(s) characterizing each said discrete clinical outcome; and
- d. repeating steps b) and c) at various time points to provide an output of a trajectory within said given probability space, wherein said trajectory is indicative of the likelihood of progression to one of said at least three discrete clinical outcomes.

2. The method of claim 1, further comprising calculating a velocity based on said trajectory, wherein said velocity is indicative of the progression of a medical condition of said subject.

3. The method of claim 1, further comprising calculating an acceleration based on said trajectory, wherein said acceleration is indicative of the progression of a medical condition of said subject.

4. The method of claim 1 further comprising notifying a medical personnel or the subject of a need for taking a medical action upon assessing or characterizing the position of said subject data in said probability space.

5. The method of claim 4 wherein the medical action involves at least one action selected from the group consisting of altering a dosage of an existing therapeutic agent administered to said subject, administering a different a therapeutic agent, and administering a different combination of therapeutic agents.

6. The method of claim 5 further comprising, upon selection of at least one action, performing an outcome analysis for

assessing a result of said selected action, and automatically updating the probability of a discrete clinical outcome of said subject.

7. The method of claim 1 wherein said at least three discrete clinical outcomes are selected from the group consisting of complete response (CR), partial response (PR), stable disease (SR), non-response(NR), adverse drug effect (ADR), and drug toxicity.

8. The method of claim 1, further comprising the step of (e) identifying a medical intervention appropriate to achieve or avoid said one of said at least three discrete clinical outcomes indicated by said trajectory.

9. A method of characterizing a clinical outcome of a subject comprising:

- a. constructing, with the aid of a computer processor within a server that executes a program to construct a probability space, the probability space defined by at least three discrete clinical outcomes, each discrete clinical outcome of said at least three discrete clinical outcomes is characterized by a statistical distribution of a set of biological marker(s), wherein the statistical distribution for a given set of biological marker(s) is different from all other statistical distributions for all other sets of biological markers characterizing each of the clinical outcomes within a given probability space, and wherein said given probability space is reflective of said at least three discrete clinical outcomes associated with a medical condition, medical procedure, therapy, clinical trial, drug discovery, or drug development;
- b. providing data of a subject to the server, said data corresponding to the set of biological marker(s) for each discrete clinical outcome within the given probability space;
- c. calculating, with the aid of a computer processor that executes a program to determine the position of the subject data in the given probability space, the position of said subject data in said given probability space based on where said subject data falls within the statistical distribution of said set of biological marker(s) characterizing each said discrete clinical outcome; and
- d. repeating steps b) and c) at various time points to provide an output of a trajectory within said given probability space, wherein said trajectory is indicative of the likelihood of progression to one of said at least three discrete clinical outcomes.

10. The method of claim 9 further comprising notifying a medical personnel or the subject of a need for taking a medical action upon assessing or characterizing the position of said subject data in said probability space.

11. The method of claim 9 wherein said at least three discrete clinical outcomes are selected from the group consisting of complete response (CR), partial response (PR), stable disease (SR), non-response(NR), adverse drug effect (ADR), and drug toxicity.

12. A medical information system for subject data analysis comprising:

- a. an input device for receiving subject data representing measurements of one or more biological markers;
- b. a computer processor in communication with said input device, wherein said computer processor
  - i. constructs one or more probability spaces, each probability space defined by at least three discrete clinical outcomes, wherein each discrete clinical outcome of said at least three discrete clinical outcomes is characterized by a statistical distribution of a set of biological marker(s), wherein the statistical distribution for a given set of biological marker(s) is different from