

What is claimed is:

1. A method of predicting a glycation percentage of an amino acid in a biomolecule, comprising:
 - determining a first set of de-glycation rates of the amino acid for a first temperature set over a first predetermined time frame;
 - inferring a second set of one or more de-glycation rate(s) of the amino acid for a second temperature set of one or more temperatures based on the first set of de-glycation rates; and
 - using the second set of one or more de-glycation rate(s) to predict the glycation percentage at any temperature corresponding to the second temperature set and over a duration encompassed by a second predetermined time frame.
2. The method of claim 1, wherein the first temperature set comprises temperatures that are higher than those of the second temperature set.
3. The method of claim 2, wherein the first temperature set includes temperatures ranging from 20-45 °C; and wherein the second temperature set includes temperatures ranging from 2-8 °C.
4. The method of claim 3, wherein the second temperature set corresponds to a temperature of 5 °C.
5. The method of claim 1, wherein the first predetermined time frame is less than 40 days, and wherein the second predetermined time frame is between 3 months and 36 months.
6. The method of claim 1, wherein determining the first set of de-glycation rates for the first temperature set over the first time duration further comprises:
 - measuring a percentage of glycation of the amino acid for each temperature included in the first temperature set, as a function of time corresponding to at least a portion of the first time duration; and
 - performing a data-fitting procedure to obtain the first set of de-glycation rates.
7. The method of claim 1, further comprising determining the first set of de-glycation rates as a function of two or more different pH values; and

for each of the two or more different pH values, determining an activation energy associated with de-glycation of the amino acid based on the first set of de-glycation rates.

8. The method of claim 7, further comprising:

inferring the second set of de-glycation rate(s) as a function of at least one of the two or more different pH values; and

using the second set of de-glycation rate(s) to predict the glycation percentage at any temperature corresponding to the second temperature set and over any duration encompassed by the second predetermined time frame as a function of at least one of the two or more different pH values.

9. The method of claim 1, further comprising determining the first set of de-glycation rates in absence of glucose, wherein the amino acid of the biomolecule is glycated to a predetermined first percentage; and

wherein predicting the glycation percentage is based on the second set of one or more de-glycation rate(s), the predetermined first percentage to which the amino acid of the biomolecule is glycated, and a difference between the predetermined first percentage and 0% glycation.

10. The method of any one of claims 1-9, wherein the biomolecule is an antibody.

11. The method of claim 10, wherein the amino acid is located within a variable region that impacts antigen binding.

12. The method of claim 11, wherein the amino acid is located within a complementarity determining region (CDR).

13. The method of claim 12, wherein the CDR is located within the heavy chain variable region.

14. The method of claim 13, wherein the amino acid is located within HCDR3.