

Claims

1. A method for the chromatographic purification and/or separation of protein glycoforms by contacting the sample comprising the protein glycoforms with a separation material comprising of a base matrix to the surfaces of which polymer chains are covalently bonded, characterised in that
- the polymer chains comprise end groups -N(Y)-R3 with Y being independently from each other H or CH₃, and
- R3 being -CHCOOMR4 with R4 being C1 to C4 alkyl or C1 to C4 perfluoroalkyl and M being H, Na, K, or NH₄.
2. The method of claim 1 comprising the steps of
- a) contacting the sample comprising the protein glycoforms with said separation material whereby one or more of the protein glycoforms are bound to the separation material
- b) optionally washing the separation material
- c) contacting the separation material with an elution buffer under conditions in which bound protein glycoforms elute from the separation material
3. Method according to claim 1 or claim 2, characterized in that the method further includes recovering protein glycoforms which flow through the separation material in step a).
4. Method according to one or more of claims 1 to 3, characterized in that the elution buffer has a pH higher than the loading buffer used for contacting the sample with the separation material in step a).

5. Method according to one or more of claims 1 to 4, characterized in that, in step a), the sample contacted with the separation material in step a) has a conductivity of between 5 and 60 mS/cm.

- 5 6. Method according to one or more of claims 1 to 5, characterized in that the sample comprises one or more of the following:
- mannose rich protein glycoforms
 - terminal mannose protein glycoforms
 - fucosylated and non-fucosylated protein glycoforms
 - 10 - glycosylated and non-glycosylated proteins.

7. Method according to one or more of claims 1 to 6, characterized in that the sample comprises glycosylated antibodies and/or viral protein glycoforms.
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8. Method according to one or more of claims 1 to 7, characterized in that the polymer chains are build by monomer units and the monomer units of the polymer chains are linked in a linear manner and each monomer unit comprises an end group -N(Y)-R3.
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9. Method according to one or more of claims 1 to 8, characterized in that Y is H and R4 is isopropyl and/or isobutyl.
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10. Method according to one or more of claims 1 to 9, characterized in that the ionic density of the separation material is between 10-1200 µeq/g.

11. Method according to one or more of claims 1 to 10, characterized in that the protein glycoforms are bound to the separation material at a pH
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between 2 and 7, optionally washed and eluted by increasing the pH value to a value between 9 and 11.

5 12. Method according to one or more of claims 1 to 11, characterized in that the sample is applied to the separation material at an ionic density between 10-1200 µeq/g.

10 13. Method according to one or more of claims 1 to 12, characterized in that between 10 mg and 100 mg of the protein glycoforms are bound per ml of the separation material.

15 14. Method according to one or more of claims 1 to 13, characterized in that the sample comprises SARS-CoV-2 protein glycoforms.

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