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WILD TYPE HUMAN FACTOR VII cDNA

GCCAACGCCTTCCTGGAGGAGCTGCGGCCGGGCTCCCTGGAGAGGGAGTGCAAGGAGGAGC
 AGTGCTCCTTCGAGGAGGCCCGGGAGATCTTCAAGGACGCGGAGAGGACGAAGCTGTTCTGGATTTT
 TTACAGTGATGGGGACCAGTGTGCCTCAAGTCCATGCCAGAATGGGGGCTCCTGCAAGGACCAGCTC
 CAGTCCATATATCTGCTTCTGCCTCCCTGCCTTCGAGGGCCGGAAGTGTGAGACGCACAAGGATGACCA
 GCTGATCTGTGTGAACGAGAACGCGGGCTGTGAGCAGTACTGCAGTGACCACACGGGCACCAAGCGC
 TCCTGTCGGTGCCACGAGGGGTACTCTCTGCTGGCAGACGGGGTGTCTGCACACCCACAGTTGAATA
 TCCATGTGAAAAATACCTATTCTAGAAAAAGAAATGCCAGCAAACCCCAAGGCCGAATTGTGGGG
 GGCAAGGTGTGCCCCAAAGGGGAGTGTCCATGGCAGGTCTGTGTTGGTGAATGGAGCTCAGTTGT
 GTGGGGGGACCCTGATCAACACCATCTGGGTGGTCTCCGCGGCCCACTGTTTCGACAAAATCAAGAA
 CTGGAGGAACCTGATCGCGGTGCTGGGCGAGCAGACCTCAGCGAGCAGCAGCGGGGATGAGCAGAG
 CCGGCGGGTGGCGCAGGTGATCATCCCCAGCAGTACGTCCCGGGCACCACCAACCACGACATCGCG
 CTGCTCCGCCTGCACAGCCCGTGGTCTCACTGACCATGTGGTGCCCTCTGCCTGCCCGAACGGAC
 GTTCTCTGAGAGGAGCTGGCCTTCGTGCGCTTCTCATTGGTCAGCGGCTGGGGCCAGCTGCTGGACC
 GTGGCGCCACGGCCCTGGAGCTCATGGTCCCTCAACGTGCCCGGGCTGATGACCCAGGACTGCCTGCA
 GCAGTCACGGAAGGTGGGAGACTCCCCAAATATCACGGAGTACATGTTCTGTGCCGGCTACTCGGAT
 GGCAGCAAGGACTCCTGCAAGGGGACAGTGGAGGCCCCACATGCCACCCACTACCGGGGCAGTGGT
 ACCTGACGGGCATCCTCAGCTGGGGCCAGGGCTGCGCAACCGTGGGCCACTTTGGGGTGTACACCAG
 GGTCTCCAGTACATCGAGTGGCTGCAAAGCTCATGCGCTCAGAGCCACGCCCAGGAGTCTCTCTGC
 GAGCCCCATTTCCC (SEQ ID NO: 1)

WILD TYPE HUMAN FACTOR VII AMINO ACID SEQUENCE

ANAFLEELRPGSLERECKEEQCSFEEAREIFKDAERTKLEWISYSDGDQCASSPCQNGGSKDQL
 QSYICFCLPAFEGRNCETHKDDQLICVNENGGCEQYCS DHTGTRSCRCHEGYSLLADGVSCTPTVEYPCG
 KIPILEKRNASKPQGRIVGGKVC PKGEC PWQVLLVNGAQLCGGTLINTIWVVSAAHCFDKIKNWRNLIAV
 LGEHDLSEHDGDEQSRRAQVIIPSTYVPGTTNHDIALRLHQPVVLT DHVVPLCLPERTFSERTLAFVRF
 LVSGWQQLLDRGATALELMVLNVPRLMTQDCIQSRKVGDSFNITEYMFACGYS DGSKDSCKGDSGGP
 HATHYRG TWYLTGIVSWGQCATVGHFVG YTRVSQYIEWLQKLMRSEPRPGVLLRAPFP (SEQ ID NO: 2)

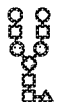
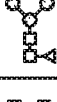
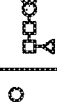
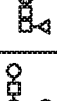
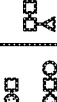
FIG. 1

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A DNA SEQUENCE ENCODING WILD TYPE HUMAN FACTOR VII:

atggtcagcccaagcccttcgacctcctctctctcctcctcctcctcagggatgtctcggcag
 caggcccgagagcgaacgcgttcctggagagtttgaggcccgctcactggaacgggaatgcaaggaggagcagtgctcatctgaagaggccag
 agagatttcaaggatgcagaaacgaagtgttctggatctcctactcagaaggagatcagtgccctcgtcggcccaaaacggaggctcatgc
 aaagacagctccagtcctacatctgtctcgtccgggttcgaaggcggaactgtgaaactcacaaggatgaccagctcatctcgttfaacgaaa
 acgggggatgcgaacagtaactgtaggcaccataccggaaccaagcgtcgtgcagatgccagagggttactcctcgttcggacgggtgtcgtgt
 actccaaccgtcgagtaccgtcggaagatccctatcctggagaaacgcaacgcataccaagcctcagggaaggatcgtgggggggaaggctctgtc
 caaaggagaatgccctggcaagtgtctcctcgtgaacggagctcagctgtgcgggggaacgctcatcacaataccatctgggtggttcggccgg
 cactgctcgataagatcaagaaatggcggaatctgatgcggtgtctgggagagcactgtccgagcaacggcgatgaacagtcacagacggt
 cgcgaagtgatccccgtcgacttacgtgcgggggaaccaccaatacagacatcgcccttttggactccatcagcctgttctgctgactgaccaagtgcg
 tccgctctgtctgcagaaacggacgttctccgaagaacacctggcctttgtgaggttagcctggtgagcggatggggacaactgctggacaggggcg
 cgactgctctggaactgatgtgcttaatgtgccacgggtgatgacccaagactgcctgcagcagctctcgttaaggctcggcgactcgccgaatatcactga
 gtacatgtctcggctggctacagcgatggcagcaaggattcatgtaaaggagatagcgggtggccacatgcaactcactatcggcggtacctggtacctg
 accggaattgtctcgtggggaacaggttgccgtaccgtcgggtcafttcggagtgtafactcgcgtgtcgcagttacattgaatggttgcagaaactcatcgcc
 tccgagcctcggccgggagtgctgctgagagccccctttccg (SEQ ID NO: 3)

FIG. 2

GLYCAN NUMBER	FORMULA	EXEMPLARY STRUCTURE
I	(GlcNAc) ₄ (Man) ₃ (Gal) ₂ (Fuc)	
II	(GlcNAc) ₅ (Man) ₃ (Gal)(Fuc)	
III	(GlcNAc) ₆ (Man) ₃ (Fuc)	
IV	(GlcNAc) ₅ (Man) ₃ (Gal) ₃ (Fuc)	
V	(GlcNAc) ₆ (Gal) ₄ (Man) ₃ (Fuc)	
VI	(GlcNAc) ₄ (Man) ₃ (Gal)(Fuc)	
VII	(GlcNAc) ₅ (Man) ₃ (Fuc)	
VIII	(GlcNAc) ₅ (Man) ₃ (Gal)	
IX	(Man) ₅ (GlcNAc) ₃ (Gal)(Fuc)	
X	(GlcNAc) ₃ (Man) ₃ (Gal)(Fuc)	
XI	(GlcNAc) ₄ (Man) ₃ (Gal)	

LEGEND

○ = GALACTOSE (Gal)

□ = N-ACETYLGALACTOSAMINE (GlcNAc)

● = MANNOSE (Man)

△ = FUCOSE (Fuc)

FIG. 3

atggcaactgggtcgggacctccttgcttctgcgcttgcggtctgtctgccttgcagaggggaagcgtgcacctacacctccgaaagccc
gactctccggccaggatccttcaggaaactaatctggctgagatcggactcgcgccaaactttttaccgcataccagccctgaactacttgggcaacg
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gcagggatgtgagatccaatttcgctcatcggcgagggtatcagctcaagtacggaccgcataaaggtcgcctatccaaacatcgcgggaga
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caaccagaagtgcaagtcactgtaccaaacaggaaggccagaccctttcgggagcaaccgtactgttacacccgagcggcgttcggtcggcaact
actgtccgggtgcctgacgtggccctggtgctccgtgacgtgacgttcgctgacgcaccagcgacgctcgggcccaagagcctgaag
ccgcttcacgaccccgatggtgagagtgtcaaggttacctttactgcaactactccgctcgtccccaaagtgaggactgaccatc (SEQ ID NO:
4)

4
5
6

AMINO ACID SEQUENCE OF ARTEROBACTER UREFACIENS SIALIDASE CATALYTIC DOMAIN. A SECRETION SIGNAL SEQUENCE IS UNDERLINED.

Matgsrtsllllafgllclpwlcegsaaptpnsp¹lpqgsfsetnl²aa³drta⁴anffyr⁵ipal⁶tylg⁷ndv⁸laaw⁹dgr¹⁰pqa¹¹ada¹²pn¹³nsi¹⁴q¹⁵rrs¹⁶td¹⁷ggk¹⁸
twg¹⁹qv²⁰via²¹agh²²vad²³as²⁴qpr²⁵vy²⁶sd²⁷ps²⁸iy²⁹dae³⁰ank³¹via³²ffv³³ys³⁴k³⁵dg³⁶fg³⁷gs³⁸qf³⁹nd⁴⁰dad⁴¹rn⁴²vl⁴³ss⁴⁴av⁴⁵ies⁴⁶d⁴⁷ag⁴⁸vt⁴⁹sq⁵⁰pr⁵¹l⁵²its⁵³vt⁵⁴k⁵⁵pg⁵⁶ts⁵⁷kt⁵⁸n⁵⁹
pa⁶⁰gd⁶¹vr⁶²sn⁶³fa⁶⁴ss⁶⁵ge⁶⁶gi⁶⁷ql⁶⁸ky⁶⁹q⁷⁰ph⁷¹kg⁷²rl⁷³q⁷⁴ya⁷⁵gd⁷⁶vr⁷⁷qa⁷⁸ds⁷⁹sn⁸⁰ki⁸¹av⁸²sv⁸³sd⁸⁴h⁸⁵vt⁸⁶wh⁸⁷kg⁸⁸an⁸⁹vg⁹⁰d⁹¹md⁹²en⁹³kt⁹⁴vel⁹⁵sd⁹⁶gr⁹⁷vl⁹⁸ln⁹⁹sr¹⁰⁰dn¹⁰¹an¹⁰²rg¹⁰³y¹⁰⁴
rk¹⁰⁵va¹⁰⁶st¹⁰⁷d¹⁰⁸gg¹⁰⁹at¹¹⁰y¹¹¹gv¹¹²sq¹¹³dt¹¹⁴elp¹¹⁵dp¹¹⁶ann¹¹⁷ga¹¹⁸ia¹¹⁹rm¹²⁰fo¹²¹na¹²²ag¹²³gs¹²⁴ada¹²⁵ak¹²⁶kl¹²⁷if¹²⁸tn¹²⁹sk¹³⁰tg¹³¹ren¹³²vs¹³³ar¹³⁴vs¹³⁵cd¹³⁶de¹³⁷tw¹³⁸pg¹³⁹vr¹⁴⁰t¹⁴¹ir¹⁴²sg¹⁴³fs¹⁴⁴ay¹⁴⁵st¹⁴⁶vt¹⁴⁷rl¹⁴⁸ad¹⁴⁹ck¹⁵⁰f¹⁵¹
gv¹⁵²ly¹⁵³eg¹⁵⁴ny¹⁵⁵td¹⁵⁶nm¹⁵⁷pr¹⁵⁸at¹⁵⁹fd¹⁶⁰daw¹⁶¹ln¹⁶²yc¹⁶³api¹⁶⁴av¹⁶⁵pn¹⁶⁶ia¹⁶⁷ps¹⁶⁸at¹⁶⁹qev¹⁷⁰pt¹⁷¹vt¹⁷²ng¹⁷³ea¹⁷⁴tl¹⁷⁵sg¹⁷⁶at¹⁷⁷at¹⁷⁸vy¹⁷⁹tp¹⁸⁰sg¹⁸¹ws¹⁸²at¹⁸³tp¹⁸⁴vp¹⁸⁵d¹⁸⁶va¹⁸⁷pg¹⁸⁸as¹⁸⁹vt¹⁹⁰vt¹⁹¹al¹⁹²ta¹⁹³pa¹⁹⁴da¹⁹⁵
sg¹⁹⁶pr¹⁹⁷sl¹⁹⁸na¹⁹⁹af²⁰⁰tt²⁰¹ad²⁰²gr²⁰³vs²⁰⁴q²⁰⁵ft²⁰⁶it²⁰⁷at²⁰⁸tp²⁰⁹va²¹⁰qv²¹¹gl²¹²ti (SEQ ID NO: 5)

FIG. 5

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PLASMID MAP FOR THE SIALIDASE EXPRESSION PLASMID pMB279.

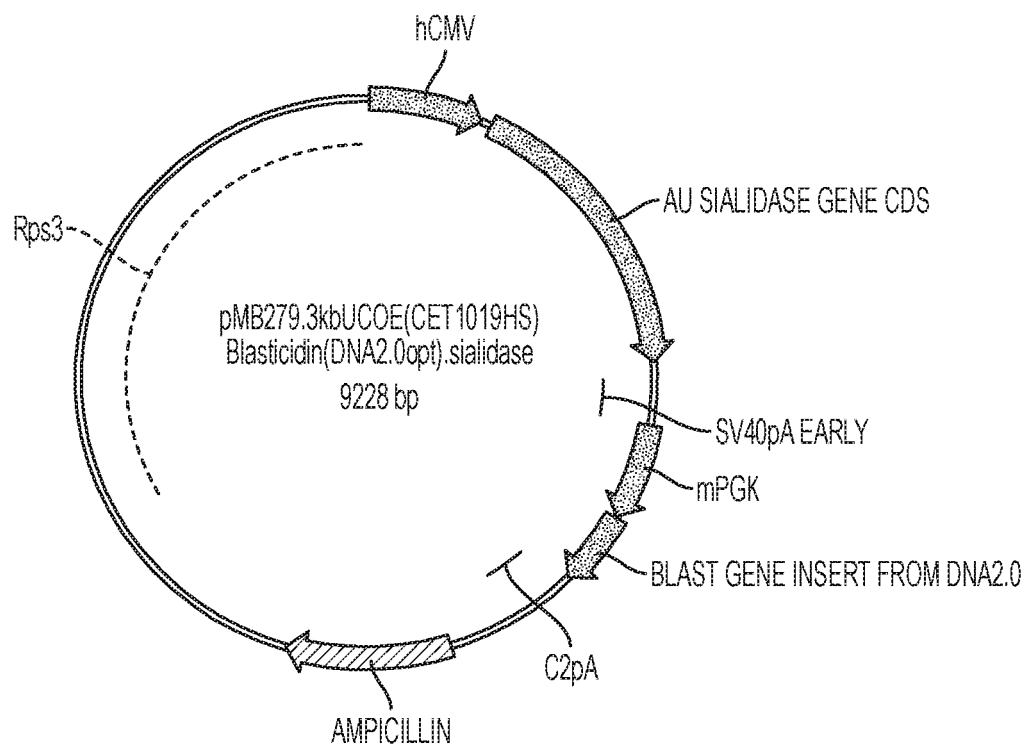


FIG. 6

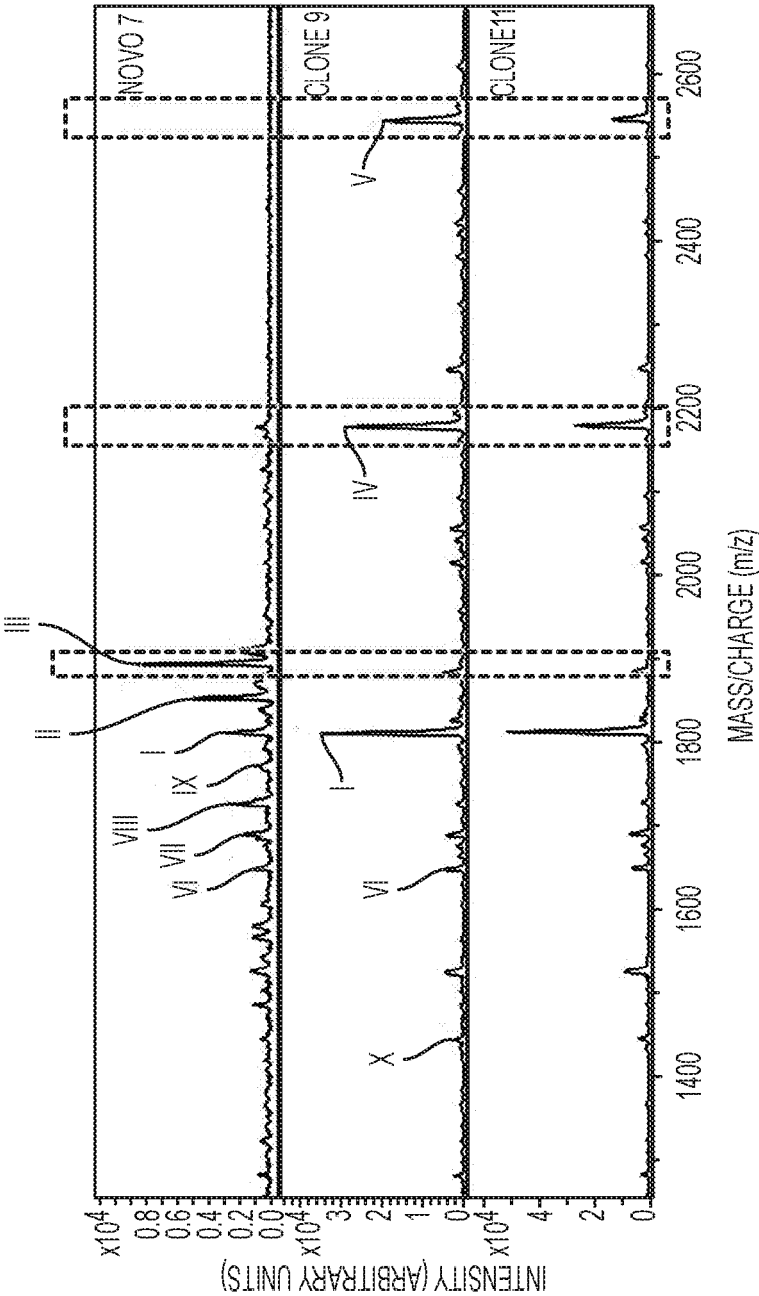


FIG. 7

2-AA PROFILING FOR NEUTRAL N-GLYCAN FROM dsFvII samples

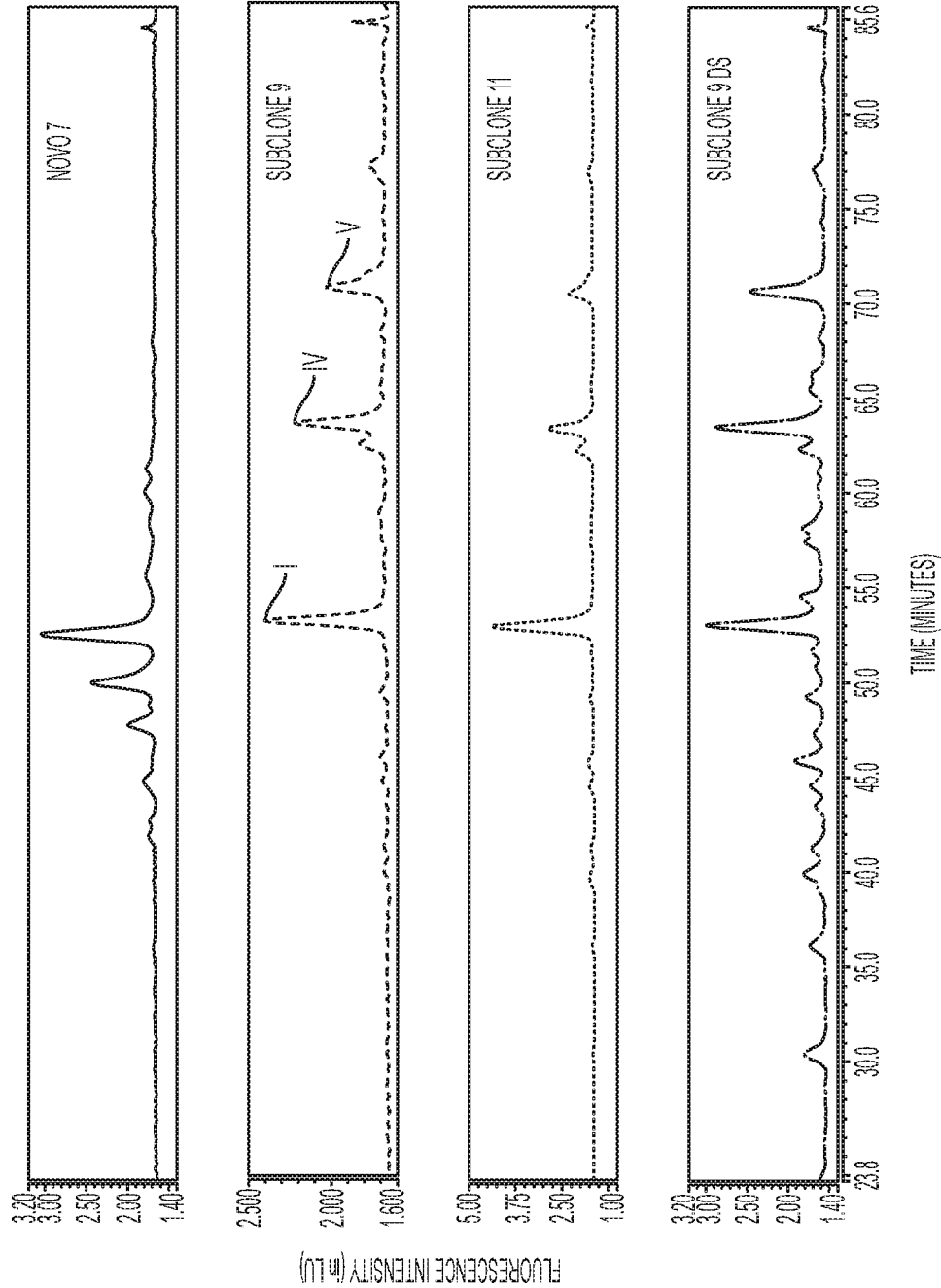


FIG. 8

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N-GLYCAN DISTRIBUTION FOR FVII HEAVY CHAIN
COMPARISON OF dswtFVIIa and dsNOVO7

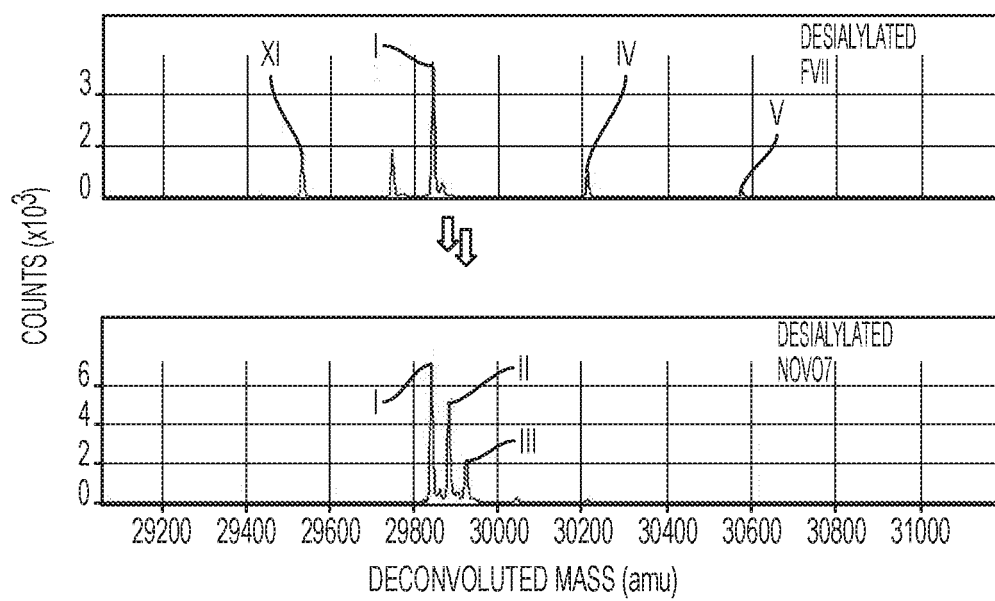


FIG. 9