

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT4292010

|   |                               |
|---|-------------------------------|
| <b>SUBMISSION TYPE:</b>   | NEW ASSIGNMENT                |
| <b>NATURE OF CONVEYANCE:</b>  | ASSIGNMENT                    |
| <b>CONVEYING PARTY DATA</b>   |                               |
| <b>Name</b>   | <b>Execution Date</b>         |
| BIOGEN MA INC.  | 01/31/2017                    |
| <b>RECEIVING PARTY DATA</b>   |                               |
| <b>Name:</b>  | BIOVERATIV THERAPEUTICS INC.  |
| <b>Street Address:</b>  | 225 SECOND AVENUE             |
| <b>City:</b>  | WALTHAM                       |
| <b>State/Country:</b>   | MASSACHUSETTS                 |
| <b>Postal Code:</b>   | 02451                         |
| <b>PROPERTY NUMBERS Total: 3</b>  |                               |
| <b>Property Type</b>  | <b>Number</b>                 |
| <b>Application Number:</b>  | 61969801                      |
| <b>Application Number:</b>  | 15128951                      |
| <b>PCT Number:</b>  | US2015022141                  |
| <b>CORRESPONDENCE DATA</b>  |                               |
| <b>Fax Number:</b>  | (202)371-2540                 |
| <i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i> |                               |
| <b>Phone:</b>   | 2023712600                    |
| <b>Email:</b>   | dstout@skgf.com               |
| <b>Correspondent Name:</b>  | SKGF PLLC                     |
| <b>Address Line 1:</b>  | 1100 NEW YORK AVENUE, N.W.    |
| <b>Address Line 4:</b>  | WASHINGTON, D.C. 20005        |
| <b>ATTORNEY DOCKET NUMBER:</b>  | 4159.0000000                  |
| <b>NAME OF SUBMITTER:</b>   | JI-EUN KIM                    |
| <b>SIGNATURE:</b>   | /Ji-Eun Kim, Reg. No. 68,504/ |
| <b>DATE SIGNED:</b>   | 02/26/2017                    |
| <b>Total Attachments: 46</b>  |                               |
| source=BIOVERATIV THERAPEUTICS_Patent_Assignment_Agreement#page1.tif  |                               |
| source=BIOVERATIV THERAPEUTICS_Patent_Assignment_Agreement#page2.tif  |                               |
| source=BIOVERATIV THERAPEUTICS_Patent_Assignment_Agreement#page3.tif  |                               |
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## PATENT ASSIGNMENT

For valuable consideration, Biogen MA Inc., a corporation of Massachusetts having a place of business at 250 Binney Street, Cambridge, Massachusetts 02142, hereby assign to Bioerativ Therapeutics Inc., a corporation of Delaware having a place of business at:

225 Second Avenue  
Waltham, MA 02451,

and its successors and assigns (collectively hereinafter called “the Assignee”), our entire right, title and interest throughout the world in the inventions and improvements which are subject of those patents and patent applications set forth on Schedule A of this assignment, this assignment including said patents and patent applications, any and all United States and foreign utility patents and patent applications, including continuation, continuation-in-part, divisional, reissue, and reexamination applications, utility models, and design registrations granted for any of said inventions or improvements, and the right to claim priority based on the filing date of said application under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes; and we authorize the Assignee to apply in all countries in our name or in its own name for patents, utility models, design registrations and like rights of exclusion and for inventors’ certificates for said inventions and improvements; and we agree for ourselves and our respective heirs, legal representatives and assigns, without further compensation to perform such lawful acts and to sign such further applications, assignments, Preliminary Statements and other lawful documents as the Assignee may reasonably request to effectuate fully this assignment.

DATE: January 31, 2017 at  
3:00 p.m. Eastern Time

SIGNED, on behalf of the said Assignor,

BIOGEN MA INC.

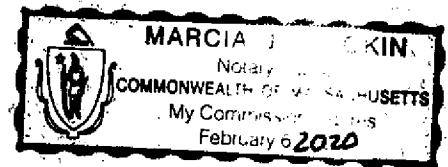
By: Rynne Sullivan  
Name: Rynne Sullivan  
Title: SVP Finance  
Dated: January 31, 2017 3:00 PM Eastern Time

Before me this 27<sup>th</sup> day of January 2017, personally appeared Rynne Sullivan, representative of Assignor, known to me to be the person whose name is subscribed to the foregoing Assignment, and acknowledged that he executed the same as his free and act and deed for the purposes therein contained.

Marcia J. O'Kin

Notary Public

My commission expires:



SIGNED, on behalf of the said Assignee,

BIOVERATIV THERAPEUTICS INC.

By: 

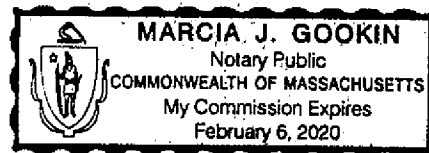
Name: John G. Cox

Title: CEO BIOVERATIV

Dated: January 31, 2017 3:00 PM Eastern Time

Before me this 27<sup>th</sup> day of January 2017, personally appeared John G. Cox, representative of Assignee, known to me to be the person whose name is subscribed to the foregoing Assignment, and acknowledged that he executed the same as his free and act and deed for the purposes therein contained.

  
Notary Public



Schedule A

Patents and Patent Applications

**Schedule A**  
**Patents and Patent Applications**

**PATENT FAMILIES OWNED BY BIOGEN MA INC.**

| <b>RECOMBINANT FcRn AND VARIANTS THEREOF FOR PURIFICATION OF Fc-CONTAINING FUSION PROTEINS</b> |                    |                    |                    |                   |   |               |
|--|--------------------|--------------------|--------------------|-------------------|---|---------------|
| <b>ASSIGNED TO: BIOGEN MA INC.</b>   |                    |                    |                    |                   |   |               |
| <b>BIOGEN REF. NO.</b>   | <b>S/N PUB NO.</b> | <b>FILING DATE</b> | <b>PUB/PAT NO.</b> | <b>INVENTORS</b>  | <b>TITLE</b>  | <b>STATUS</b> |
| P0794 US 001   | 61/107,625         | 10/22/2008         |                    | McDonnell         | Recombinant FcRn And Variants Thereof For Purification Of Fc-Containing Fusion Proteins | Inactive      |
| P0794 US 002   | 13/125,795         | 10/21/2009         | US 2012-0021484 A1 | McDonnell         | Recombinant FcRn And Variants Thereof For Purification Of Fc-Containing Fusion Proteins | Abandoned     |
| P0794 EP 001   | 9744844.3          | 10/21/2009         | EP2365979          | McDonnell         | Recombinant FcRn And Variants Thereof For Purification Of Fc-Containing Fusion Proteins | Abandoned     |
| P0794 HK 001   | 12102214.2         | 03/05/2012         |                    | McDonnell         | Recombinant FcRn And Variants Thereof For Purification Of Fc-Containing Fusion Proteins | Abandoned     |
| P0794 WO 001   | PCT/US/2009/061517 | 10/21/2009         | WO 2010/048313     | McDonnell         | Recombinant FcRn And Variants Thereof For Purification Of Fc-Containing Fusion Proteins | Inactive      |
| <b>PRO-COAGULANT COMPOUNDS AND METHODS OF USE THEREOF</b>                                      |                    |                    |                    |                   |   |               |
| <b>ASSIGNED TO: BIOGEN MA INC.</b>   |                    |                    |                    |                   |   |               |
| <b>BIOGEN REF. NO.</b>   | <b>S/N PUB NO.</b> | <b>FILING DATE</b> | <b>PUB/PAT NO.</b> | <b>INVENTORS</b>  | <b>TITLE</b>  | <b>STATUS</b> |
| P0918 US 001   | 61/495,818         | 6/10/2011          |                    | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof                                      | Expired       |

|              |                   |           |                 |                   |  |         |
|--------------|-------------------|-----------|-----------------|-------------------|--|---------|
| P0918 US 002 | 61/600,237        | 2/17/2012 |                 | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof | Expired |
| P0918 US 003 | 61/605,540        | 3/1/2012  |                 | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof | Expired |
| P0918US004   | 14/125,040        | 6/9/2012  | US 9,486,507 B2 | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof | Granted |
| P0918 AU 001 | 2012267484        | 6/9/2012  |                 | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof | Pending |
| P0918 CA 001 | 2,838,833         | 6/9/2012  |                 | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof | Pending |
| P0918 EP 001 | 12797036.6        | 6/9/2012  | EP2717898 A2    | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof | Pending |
| P0918 NZ 001 | 619079            | 6/9/2012  |                 | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof | Allowed |
| P0918 PC 001 | PCT/US2012/041777 | 6/9/2012  | WO 2012/170969  | Thorn; Toby; Mezo | Pro-coagulant Compounds and Methods of Use Thereof | Expired |

| VON WILLEBRAND FACTOR FRAGMENTS, VWF COMPLEX WITH FACTOR VIII, AND USES THEREOF |             |             |             |                             |   |         |
|---|-------------|-------------|-------------|-----------------------------|---|---------|
| ASSIGNED TO: BIOGEN MA INC.   |             |             |             |                             |   |         |
| BIOGEN REF. NO.   | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS                   | TITLE   | STATUS  |
| P0950 US 001  | 61/586,099  | 1/12/2012   |             | Chhabra; Liu; Peters; Jiang | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Expired |
| P0950 US 002  | 61/586,654  | 1/13/2012   |             | Chhabra; Liu; Peters; Jiang | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Expired |
| P0950 US 003  | 61/667,901  | 7/3/2012    |             | Chhabra; Liu; Peters; Jiang | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Expired |



| VON WILLEBRAND FACTOR FRAGMENTS, VWF COMPLEX WITH FACTOR VIII, AND USES THEREOF |                      |             |                       |                                   |   |         |  |
|---|----------------------|-------------|-----------------------|-----------------------------------|---|---------|--|
| ASSIGNED TO: BIOGEN MA INC.   |                      |             |                       |                                   |   |         |  |
| BIOGEN REF. NO.   | S/N PUB NO.          | FILING DATE | PUB/PAT NO.           | INVENTORS                         | TITLE   | STATUS  |  |
| P0950 US 004  | 61/734,954           | 12/7/2012   |                       | Chhabra;<br>Liu; Peters;<br>Jiang | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Expired |  |
| P0950 US 005  | 14/371,948           | 1/12/2013   | US 2015-0023959<br>A1 | Liu; Peters;<br>Jiang             | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 AU 001  | 2013205647           | 1/12/2013   | AU 2013205647         | Chhabra;<br>Liu; Peters;<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Granted |  |
| P0950 AU 002  | 2016202875           | 1/12/2013   |                       | Liu; Peters;<br>Jiang             | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 BR 001  | BR112014017<br>165.3 | 1/12/2013   |                       | Chhabra;<br>Liu; Peters<br>Jiang  | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Pending |  |
| P0950 CA 001  | 2,863,328            | 1/12/2013   |                       | Chhabra;<br>Liu; Peters<br>Jiang  | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 CL 001  | 1825-2014            | 1/12/2013   |                       | Chhabra;<br>Liu; Peters<br>Jiang  | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Pending |  |
| P0950 CN 001  | 20138001345<br>2.7   | 1/12/2013   |                       | Chhabra;<br>Liu; Peters<br>Jiang  | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |

| VON WILLEBRAND FACTOR FRAGMENTS, VWF COMPLEX WITH FACTOR VIII, AND USES THEREOF |                  |             |                |                                  |   |         |  |
|---|------------------|-------------|----------------|----------------------------------|---|---------|--|
| ASSIGNED TO: BIOGEN MA INC.   |                  |             |                |                                  |   |         |  |
| BIOGEN REF. NO.   | S/N PUB NO.      | FILING DATE | PUB/PAT NO.    | INVENTORS                        | TITLE   | STATUS  |  |
| P0950 CO 001  | 14-152.717       | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Allowed |  |
| P0950 EA 001  | 201491186        | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 EP 001  | 13735649.9       | 1/12/2013   | EP2804623 (A1) | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 HK 001  | 15103334.2       | 4/1/2015    |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 ID 001  | P-00201404752    | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 IL 001  | 233463           | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 IN 001  | 5655/DELN/P/2014 | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 JP 001  | 2014-552353      | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Pending |  |

| VON WILLEBRAND FACTOR FRAGMENTS, VWF COMPLEX WITH FACTOR VIII, AND USES THEREOF |                       |             |                |                                  |   |         |  |
|---|-----------------------|-------------|----------------|----------------------------------|---|---------|--|
| ASSIGNED TO: BIOGEN MA INC.   |                       |             |                |                                  |   |         |  |
| BIOGEN REF. NO.   | S/N PUB NO.           | FILING DATE | PUB/PAT NO.    | INVENTORS                        | TITLE   | STATUS  |  |
| P0950 KR 001  | 2014-7022369          | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 MX 001  | MX/A/2014/008512      | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Pending |  |
| P0950 MY 001  | PI<br>2014002043      | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 NZ 001  | 626945                | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Allowed |  |
| P0950 NZ 002  | 723512                | 9/20/2016   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |  |
| P0950 WO 001  | PCT/US2013/<br>021330 | 1/12/2013   | WO/2013/106787 | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Expired |  |
| P0950 PH 001  | 1-2014-<br>501602     | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Pending |  |
| P0950 SG 001  | 11201403764<br>X      | 1/12/2013   |                | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Granted |  |

| VON WILLEBRAND FACTOR FRAGMENTS, VWF COMPLEX WITH FACTOR VIII, AND USES THEREOF |                  |             |             |                                  |   |         |
|---|------------------|-------------|-------------|----------------------------------|---|---------|
| ASSIGNED TO: BIOGEN MA INC.   |                  |             |             |                                  |   |         |
| BIOGEN REF. NO.   | S/N PUB NO.      | FILING DATE | PUB/PAT NO. | INVENTORS                        | TITLE   | STATUS  |
| P0950 SG 002  | 10201610193<br>R | 12/5/2016   |             | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Filed   |
| P0950 TH 001  | 1401003998       | 1/12/2013   |             | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |
| P0950 TW 001  | 102101337        | 1/14/2013   |             | Chhabra;<br>Liu; Peters<br>Jiang | Von Willebrand Factor Fragments, VWF Complex with Factor VIII, and Uses Thereof | Pending |
| P0950 ZA 001  | 2014/05094       | 1/12/2013   |             | Chhabra;<br>Liu; Peters<br>Jiang | Chimeric Factor VIII Polypeptides And Uses Thereof                              | Pending |

| DELIVERY DEVICE AND COMPONENTS THEREOF |             |             |                  |  |  |          |
|--|-------------|-------------|------------------|--|--|----------|
| ASSIGNED TO: BIOGEN MA INC.            |             |             |                  |  |  |          |
| BIOGEN REF. NO.                        | S/N PUB NO. | FILING DATE | PUB/PAT NO.      | INVENTORS                                | TITLE                                  | STATUS   |
| P0954 US 001                           | 61/617,340  | 03/29/2012  |                  | Bhatt; Chen; Fetzer; Hitscherich<br>Jr.. | Delivery Device And Components Thereof | Inactive |
| P0954 US 002                           | 14/387,939  | 03/28/2013  | 2015-<br>0057608 | Bhatt; Chen; Fetzer; Hitscherich<br>Jr.. | Delivery Device And Components Thereof | Pending  |
| P0954 EP 001                           | 13768062.5  | 03/28/2013  | 2830678          | Bhatt; Chen; Fetzer; Hitscherich<br>Jr.. | Delivery Device And Components Thereof | Pending  |

| DELIVERY DEVICE AND COMPONENTS THEREOF |                   |             |                |                                      |  |          |
|--|-------------------|-------------|----------------|--------------------------------------|--|----------|
| ASSIGNED TO: BIOGEN MA INC.            |                   |             |                |                                      |  |          |
| BIOGEN REF. NO.                        | S/N PUB NO.       | FILING DATE | PUB/PAT NO.    | INVENTORS                            | TITLE                                  | STATUS   |
| P0954 WO 001                           | PCT/US2013/034396 | 03/28/2013  | WO 2013/149032 | Bhatt; Chen; Fetzer; Hirschrich Jr.. | Delivery Device And Components Thereof | Inactive |

| OPTIMIZED FACTOR VIII GENE  |                   |             |                    |             |                            |         |
|-----------------------------|-------------------|-------------|--------------------|-------------|----------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC. |                   |             |                    |             |                            |         |
| BIOGEN REF. NO.             | S/N PUB NO.       | FILING DATE | PUB/PAT NO.        | INVENTORS   | TITLE                      | STATUS  |
| P0959 US 001                | 61/765,626        | 2/15/2013   |                    | Tan; Peters | Optimized Factor VIII Gene | Expired |
| P0959US002                  | 14/767,425        | 2/14/2014   | US 2015-0361158 A1 | Tan; Peters | Optimized Factor VIII Gene | Pending |
| P0959 EP 001                | 14751254.5        | 2/14/2014   | EP2956477 A1       | Tan; Peters | Optimized Factor VIII Gene | Pending |
| P0959 WO 001                | PCT/US2014/016441 | 2/14/2014   | WO 2014/127215     | Tan; Peters | Optimized Factor VIII Gene | Expired |

| SYRINGE                     |             |             |             |                                  |                      |         |
|-----------------------------|-------------|-------------|-------------|----------------------------------|----------------------|---------|
| ASSIGNED TO: BIOGEN MA INC. |             |             |             |                                  |                      |         |
| BIOGEN REF. NO.             | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS                        | TITLE                | STATUS  |
| P0960 US 001                | 29/468,730  | 10/02/2013  | D751,705    | Bhatt; Chen; Fetzer; Hirschrich. | Syringe              | Granted |
| P0960 AU 001                | 116222014   | 04/02/2014  | 355049      | Bhatt; Chen; Fetzer; Hirschrich. | Flange For A Syringe | Granted |
| P0960 CA 001                | 155903      | 04/02/2014  | 155903      | Bhatt; Chen; Fetzer;             | Flange For A Syringe | Granted |

| SYRINGE                     |                |             |                |                                  |                     |         |
|-----------------------------|----------------|-------------|----------------|----------------------------------|---------------------|---------|
| ASSIGNED TO: BIOGEN MA INC. |                |             |                |                                  |                     |         |
| BIOGEN REF. NO.             | S/N PUB NO.    | FILING DATE | PUB/PAT NO.    | INVENTORS                        | TITLE               | STATUS  |
| P0960 EP 003                | 002438226-0003 | 04/02/2014  | 002438226-0003 | Bhatt; Chen; Fetzer; Hischerich. | Syringes (Part Of-) | Granted |
| P0960 EP 002                | 002438226-0002 | 04/02/2014  | 002438226-0002 | Bhatt; Chen; Fetzer; Hischerich. | Syringes (Part Of-) | Granted |
| P0960 EP 001                | 002438226-0001 | 04/02/2014  | 002438226-0001 | Bhatt; Chen; Fetzer; Hischerich. | Syringes (Part Of-) | Granted |
| P0960 JP 001                | 2014-007284    | 04/02/2014  | 1548953        | Bhatt; Chen; Fetzer; Hischerich. | Syringe             | Granted |

| RECOMBINANT FACTOR VIII PROTEINS |                 |             |                    |           |                                  |         |
|----------------------------------|-----------------|-------------|--------------------|-----------|----------------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC.      |                 |             |                    |           |                                  |         |
| BIOGEN REF. NO.                  | S/N PUB NO.     | FILING DATE | PUB/PAT NO.        | INVENTORS | TITLE                            | STATUS  |
| P0963 US 001                     | 61/599,305      | 2/15/2012   |                    | Kulman    | Recombinant Factor VIII Proteins | Expired |
| P0963 US 002                     | 61/670,553      | 7/11/2012   |                    | Kulman    | Recombinant Factor VIII Proteins | Expired |
| P0963 US 003                     | 61/759,785      | 2/1/2013    |                    | Kulman    | Recombinant Factor VIII Proteins | Expired |
| P0963 US 004                     | 14/379,196      | 2/15/2013   | US 2016-0355568 A1 | Kulman    | Recombinant Factor VIII Proteins | Pending |
| P0963 AU 001                     | 2013204636      | 2/15/2013   | 2013204636         | Kulman    | Recombinant Factor VIII Proteins | Granted |
| P0963 BR 001                     | BR1120140199019 | 2/15/2013   |                    | Kulman    | Recombinant Factor VIII Proteins | Pending |
| P0963 CA 001                     | 2,864,126       | 2/15/2013   |                    | Kulman    | Recombinant Factor VIII Proteins | Pending |

|              |                       |           |                       |        |                                  |         |
|--------------|-----------------------|-----------|-----------------------|--------|----------------------------------|---------|
| P0963 EA 001 | 201491388             | 2/15/2013 |                       | Kulman | Recombinant Factor VIII Proteins | Pending |
| P0963 EP 001 | 13749382.1            | 2/15/2013 | EP2822577<br>A1       | Kulman | Recombinant Factor VIII Proteins | Pending |
| P0963 HK 001 | 15105966.2            | 6/23/2015 |                       | Kulman | Recombinant Factor VIII Proteins | Pending |
| P0963 JP 001 | 2014-<br>557854       | 2/15/2013 |                       | Kulman | Recombinant Factor VIII Proteins | Pending |
| P0963 KR 001 | 2014-<br>7025369      | 2/15/2013 |                       | Kulman | Recombinant Factor VIII Proteins | Pending |
| P0963 NZ 001 | 628014                | 2/15/2013 |                       | Kulman | Recombinant Factor VIII Proteins | Allowed |
| P0963 CA 001 | PCT/US201<br>3/026521 | 2/15/2013 | WO<br>2013/12345<br>7 | Kulman | Recombinant Factor VIII Proteins | Expired |
| P0963 TW 001 | 102105586             | 2/18/2013 |                       | Kulman | Recombinant Factor VIII Proteins | Pending |

**DEVICE CONTAINER**

**ASSIGNED TO: BIOGEN MA INC.**

| <b>BIOGEN REF. NO.</b> | <b>S/N PUB NO.</b>   | <b>FILING DATE</b> | <b>PUB/PAT NO.</b> | <b>INVENTORS</b>                           | <b>TITLE</b>     | <b>STATUS</b> |
|------------------------|----------------------|--------------------|--------------------|--|------------------|---------------|
| P0972 US 001           | 61/667,550           | 07/03/2012         |                    | Gandhi; Jacoby; Janson; Presher; Steinmann | Device Container | Inactive      |
| P0972 US 002           | 14/411,739           | 07/03/2013         | 2015-<br>0164743   | Gandhi; Jacoby; Janson; Presher; Steinmann | Device Container | Pending       |
| P0972 AR 001           | P13010237<br>8       | 07/03/2013         | 091670             | Gandhi; Jacoby; Janson; Presher; Steinmann | Device Container | Pending       |
| P0972 AU 001           | 201328667<br>3       | 07/03/2013         |                    | Gandhi; Jacoby; Janson; Presher; Steinmann | Device Container | Pending       |
| P0972 BR 001           | BR1120150<br>00025-8 | 07/03/2013         |                    | Gandhi; Jacoby; Janson; Presher; Steinmann | Device Container | Pending       |
| P0972 CA 001           | 2,877,972            | 07/03/2013         |                    | Gandhi; Jacoby; Janson; Presher;           | Device Container | Pending       |

| DEVICE CONTAINER               |                  |             |             |  |                  |          |
|--------------------------------|------------------|-------------|-------------|--|------------------|----------|
| ASSIGNED TO: BIOGEN MA INC.    |                  |             |             |  |                  |          |
| BIOGEN REF. NO.                | S/N PUB NO.      | FILING DATE | PUB/PAT NO. | INVENTORS  | TITLE            | STATUS   |
| P0972 CO 001                   | 15-018.242       | 07/03/2013  |             | Steinmann<br>Gandhi; Jacoby; Janson; Presher;<br>Steinmann | Device Container | Pending  |
| P0972 EP 001                   | 13812479.7       | 07/03/2013  | 2872418     | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Pending  |
| P0972 IL 001                   | 236410           | 07/03/2013  |             | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Pending  |
| P0972 JP 001                   | 2015-520683      | 07/03/2013  | 2015-527951 | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Pending  |
| P0972 KR 001                   | 2015-7002365     | 07/03/2013  |             | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Pending  |
| P0972 MX 001                   | MX/a/2015/000109 | 07/03/2013  |             | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Pending  |
| P0972 NZ 001                   | 703337           | 07/03/2013  |             | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Allowed  |
| P0972 WO 001                   | PCT/US2013/49322 | 07/03/2013  |             | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Inactive |
| P0972 TW 001                   | 102123831        | 07/03/2013  |             | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Pending  |
| P0972 VE 001                   | 2013-000834      | 07/03/2013  |             | Gandhi; Jacoby; Janson; Presher;<br>Steinmann              | Device Container | Pending  |
| SYRINGE AND VIAL KIT PACKAGING |                  |             |             |  |                  |          |
| ASSIGNED TO: BIOGEN MA INC.    |                  |             |             |  |                  |          |
| BIOGEN REF. NO.                | S/N PUB NO.      | FILING DATE | PUB/PAT NO. | INVENTORS  | TITLE            | STATUS   |
| P0973 US 001                   | 29/478,806       | 01/08/2014  | D741,703    | Jacoby; Janson   | Package          | Granted  |
| P0973 AU 001                   | 132662014        | 07/04/2014  | 356820      | Jacoby; Janson   | Packaging        | Granted  |



| SYRINGE AND VIAL KIT PACKAGING |                |             |                |                |                         |         |
|--------------------------------|----------------|-------------|----------------|----------------|-------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC.    |                |             |                |                |                         |         |
| BIOGEN REF. NO.                | S/N PUB NO.    | FILING DATE | PUB/PAT NO.    | INVENTORS      | TITLE                   | STATUS  |
| P0973 CA 001                   | 157569         | 07/08/2014  | 157569         | Jacoby; Janson | Packaging               | Granted |
| P0973 EP 004                   | 002497545-0004 | 07/07/2014  | 002497545-0004 | Jacoby; Janson | Packaging               | Granted |
| P0973 EP 003                   | 002497545-0003 | 07/07/2014  | 002497545-0003 | Jacoby; Janson | Packaging               | Granted |
| P0973 EP 002                   | 002497545-0002 | 07/07/2014  | 002497545-0002 | Jacoby; Janson | Packaging               | Granted |
| P0973 EP 001                   | 002497545-0001 | 07/07/2014  | 002497545-0001 | Jacoby; Janson | Packaging               | Granted |
| P0973 JP 001                   | 2014-014920    | 07/08/2014  | 1520308        | Jacoby; Janson | Container for Packaging | Granted |

| METHODS OF DETECTING GLYCOSAMINOGLYCANS |                   |             |               |                             |   |          |
|---|-------------------|-------------|---------------|-----------------------------|---|----------|
| ASSIGNED TO: BIOGEN MA INC.             |                   |             |               |                             |   |          |
| BIOGEN REF. NO.                         | S/N PUB NO.       | FILING DATE | PUB/PAT NO.   | INVENTORS                   | TITLE                                   | STATUS   |
| P0979 US 001                            | 61/622,720        | 04/11/2012  |               | Sosic; Blum; Guan; Boumajny | Methods of Detecting Glycosaminoglycans | Inactive |
| P0979 US 002                            | 14/391,775        | 10/10/2014  | US2015075261  | Sosic; Blum; Guan; Boumajny | Methods of Detecting Glycosaminoglycans | Pending  |
| P0979 WO 001                            | PCT/US2013/036205 | 04/11/2013  | WO2013/155324 | Sosic; Blum; Guan; Boumajny | Methods of Detecting Glycosaminoglycans | Inactive |
| P0979 EP 001                            | 13776381.9        | 04/11/2013  | EP2836518     | Sosic; Blum; Guan; Boumajny | Methods of Detecting Glycosaminoglycans | Pending  |
| P0979 JP 001                            | 2015505915        | 04/11/2013  | JP2015518150  | Sosic; Blum; Guan; Boumajny | Methods of Detecting Glycosaminoglycans | Pending  |

**BLOOD FACTOR MONITORING ASSAY AND USES THEREOF**

| ASSIGNED TO: BIOGEN MA INC. |                   |             |                  |           |  |          |
|-----------------------------|-------------------|-------------|------------------|-----------|--|----------|
| BIOGEN REF. NO.             | S/N PUB NO.       | FILING DATE | PUB/PAT NO.      | INVENTORS | TITLE  | STATUS   |
| P0992 US 001                | 61/675,713        | 07/25/2012  |                  | Sommer    | Blood Factor Monitoring Assay And Uses Thereof | Inactive |
| P0992 US 002                | 14/416,214        | 07/25/2013  | 2015-0185235     | Sommer    | Blood Factor Monitoring Assay And Uses Thereof | Pending  |
| P0992 EP 001                | 13823087.5        | 07/25/2013  | 2877202          | Sommer    | Blood Factor Monitoring Assay And Uses Thereof | Pending  |
| P0992 HK 001                | 15111993.7        | 12/03/2015  |                  | Sommer    | Blood Factor Monitoring Assay And Uses Thereof | Pending  |
| P0992WO001                  | PCT/US2013/052101 | 07/25/2013  | WO 2014/01877 A2 | Sommer    | Blood Factor Monitoring Assay And Uses Thereof | Inactive |

| PROCOAGULANT COMPOUNDS      |                |             |                    |                           |   |           |
|-----------------------------|----------------|-------------|--------------------|---------------------------|---|-----------|
| ASSIGNED TO: BIOGEN MA INC. |                |             |                    |                           |   |           |
| BIOGEN REF. NO.             | S/N PUB NO.    | FILING DATE | PUB/PAT NO.        | INVENTORS                 | TITLE   | STATUS    |
| P1001 US 001                | 61/657,688     | 6/8/2012    |                    | Hong; Mezo; Salas; Peters | Thrombin-Activatable Procoagulant Compounds With Self-Immolative Spacers and Uses Thereof | Expired   |
| P1001 US 002                | 61/800,626     | 3/15/2013   |                    | Hong; Mezo; Salas; Peters | Thrombin-Activatable Procoagulant Compounds With Self-Immolative Spacers and Uses Thereof | Expired   |
| P1001US 003                 | 14/406,163     | 6/7/2013    | US 2015-0184142 A1 | Hong; Mezo; Salas; Peters | Procoagulant Compounds  | Pending   |
| P1001 AU 001                | 2013270682     | 6/7/2013    |                    | Hong; Mezo; Salas; Peters | Procoagulant Compounds  | Abandoned |
| P1001 CA 001                | 2,875,246      | 6/7/2013    |                    | Hong; Mezo; Salas; Peters | Procoagulant Compounds  | Abandoned |
| P1001CN001                  | 201380036823.3 | 6/7/2013    |                    | Hong; Mezo; Salas; Peters | Procoagulant Compounds  | Abandoned |
| P1001EP001                  | 13799785.4     | 6/7/2013    | EP2858659 A1       | Hong; Mezo;               | Procoagulant Compounds  | Pending   |

| PROCOAGULANT COMPOUNDS      |                      |             |                   |                              |                        |           |
|-----------------------------|----------------------|-------------|-------------------|------------------------------|------------------------|-----------|
| ASSIGNED TO: BIOGEN MA INC. |                      |             |                   |                              |                        |           |
| BIOGEN REF. NO.             | S/N PUB NO.          | FILING DATE | PUB/PAT NO.       | INVENTORS                    | TITLE                  | STATUS    |
|                             |                      |             |                   | Salas; Peters                |                        |           |
| P1001HK001                  | 15109401.7           | 6/7/2013    |                   | Hong; Mezo;<br>Salas; Peters | Procoagulant Compounds | Pending   |
| P1001 JP 001                | 2015-516264          | 6/7/2013    |                   | Hong; Mezo;<br>Salas; Peters | Procoagulant Compounds | Abandoned |
| P1001 WO 001                | PCT/US2013/44<br>841 | 6/7/2013    | WO<br>2013/185113 | Hong; Mezo;<br>Salas; Peters | Procoagulant Compounds | Expired   |

| CHIMERIC CLOTTING FACTORS   |                |             |                       |                  |                           |           |
|-----------------------------|----------------|-------------|-----------------------|------------------|---------------------------|-----------|
| ASSIGNED TO: BIOGEN MA INC. |                |             |                       |                  |                           |           |
| BIOGEN REF. NO.             | S/N PUB NO.    | FILING DATE | PUB/PAT NO.           | INVENTORS        | TITLE                     | STATUS    |
| P1007 US 001                | 61/657,685     | 6/8/2012    |                       | Salas; Kistanova | Chimeric Clotting Factors | Expired   |
| P1007 US 002                | 61/759,817     | 2/1/2013    |                       | Salas; Kistanova | Chimeric Clotting Factors | Expired   |
| P1007 US 003                | 61/801,603     | 3/15/2013   |                       | Salas; Kistanova | Chimeric Clotting Factors | Expired   |
| P1007 US 004                | 61/829,775     | 5/31/2013   |                       | Salas; Kistanova | Chimeric Clotting Factors | Expired   |
| P1007 US 005                | 14/406,160     | 6/7/2013    | US 2015-0353911<br>A1 | Salas; Kistanova | Chimeric Clotting Factors | Pending   |
| P1007 AU 001                | 2013270683     | 6/7/2013    |                       | Salas; Kistanova | Chimeric Clotting Factors | Abandoned |
| P1007 CA 001                | 2,875,247      | 6/7/2013    |                       | Salas; Kistanova | Chimeric Clotting Factors | Abandoned |
| P1007 CN 001                | 201380036553.6 | 6/7/2013    |                       | Salas; Kistanova | Chimeric Clotting Factors | Abandoned |
| P1007 EP 001                | 13799824.1     | 6/7/2013    | EP2863940 A2          | Salas; Kistanova | Chimeric Clotting Factors | Pending   |

| CHIMERIC CLOTTING FACTORS<br>ASSIGNED TO: BIOGEN MA INC. |                  |             |             |                  |                           |           |
|--|------------------|-------------|-------------|------------------|---------------------------|-----------|
| BIOGEN REF. NO.  | S/N PUB NO.      | FILING DATE | PUB/PAT NO. | INVENTORS        | TITLE                     | STATUS    |
| P1007 HK 001   | 15108385.9       | 8/28/2015   |             | Salas; Kistanova | Chimeric Clotting Factors | Abandoned |
| P1007 JP 001   | 2015-516265      | 6/7/2013    |             | Salas; Kistanova | Chimeric Clotting Factors | Abandoned |
| P1007 WO 001   | PCT/US2013/44842 | 6/7/2013    |             | Salas; Kistanova | Chimeric Clotting Factors | Expired   |

| LYOPHILIZED FACTOR IX FORMULATIONS<br>ASSIGNED TO: BIOGEN MA INC. |                      |                     |             |                                 |                                    |          |
|---|----------------------|---------------------|-------------|---------------------------------|------------------------------------|----------|
| BIOGEN REF. NO.   | S/N PUB NO.          | FILING DATE         | PUB/PAT NO. | INVENTORS                       | TITLE                              | STATUS   |
| P1008 US 001  | 61/969,801           | 03/24/2014          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Inactive |
| P1008 US 002  | 15/128,951           | [TBD]<br>03/24/2015 |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 AR 001  | P150100880           | 03/25/2015          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 AU 001  | 2015236340           | 03/24/2015          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 BR 001  | BR1120160<br>21777-2 | 03/24/2015          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 CA 001  | 2,943,034            | 03/24/2015          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 CL 001  | 2386-2016            | 03/24/2015          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 CO 001  | 2016/00032<br>29     | 03/24/2015          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 EA 001  | 201691807            | 03/24/2015          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 EP 001  | 15769411.8           | 03/24/2015          |             | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX              | Pending  |

| LYOPHILIZED FACTOR IX FORMULATIONS |                   |             |                |                                 |                                    |          |
|------------------------------------|-------------------|-------------|----------------|---------------------------------|------------------------------------|----------|
| ASSIGNED TO: BIOGEN MA INC.        |                   |             |                |                                 |                                    |          |
| BIOGEN REF. NO.                    | S/N PUB NO.       | FILING DATE | PUB/PAT NO.    | INVENTORS                       | TITLE                              | STATUS   |
| P1008 GC 001                       | 2015/29111        | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 IL 001                       | 247869            | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 JP 001                       | 2016-558751       | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 KR 001                       | 10-2016-7028692   | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 MX 001                       | MX/a/2016/012447  | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 NZ 001                       | 724351            | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 PH 001                       | 1-2016-501877     | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 SG 001                       | 11201607642R      | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 TH 001                       | 1601005518        | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 TW 001                       | 104109389         | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 UA 001                       | a201609532        | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 VE 001                       | 2015-000266       | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 ZA 001                       | 2016/06551        | 03/24/2015  |                | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Pending  |
| P1008 WO 001                       | PCT/US2015/022141 | 03/24/2014  | WO 2015/148444 | Thome; Leveille; Parkhurst-Lang | Lyophilized Factor IX Formulations | Inactive |

| CELL LINE EXPRESSING SINGLE CHAIN FACTOR VIII POLYPEPTIDES AND USES THEREOF |                  |             |                |                      |   |          |
|---|------------------|-------------|----------------|----------------------|---|----------|
| ASSIGNED TO: BIOGEN MA INC.   |                  |             |                |                      |   |          |
| BIOGEN REF. NO.   | S/N PUB NO.      | FILING DATE | PUB/PAT NO.    | INVENTORS            | TITLE   | STATUS   |
| P1009 US 001  | 61/668,889       | 07/06/2012  |                | Low; Dumont; Bitonti | Cell Line Expressing Single Chain Factor VIII Polypeptides, Single Chain Factor VIII Polypeptides, And Methods Of Use Thereof | Inactive |
| P1009 US 002  | 14/412,823       | 07/05/2013  | 2015-0191526   | Low; Dumont; Bitonti | Cell Line Expressing Single Chain Factor VIII Polypeptides And Uses Thereof   | Pending  |
| P1009 EP 001  | 13813225.3       | 07/05/2013  | 2870250        | Low; Dumont; Bitonti | Cell Line Expressing Single Chain Factor VIII Polypeptides And Uses Thereof   | Pending  |
| P1009 HK 001  | 15111207.9       | 11/13/2015  |                | Low; Dumont; Bitonti | Cell Line Expressing Single Chain Factor VIII Polypeptides And Uses Thereof   | Pending  |
| P1009 WO 001  | PCT/US2013/49460 | 07/05/2013  | WO/2014/008480 | Low; Dumont; Bitonti | Cell Line Expressing Single Chain Factor VIII Polypeptides And Uses Thereof   | Inactive |

| METHODS OF USING A FIXED DOSE OF A CLOTTING FACTOR |             |             |                    |                       |  |          |
|--|-------------|-------------|--------------------|-----------------------|--|----------|
| ASSIGNED TO: BIOGEN MA INC.                        |             |             |                    |                       |  |          |
| BIOGEN REF. NO.                                    | S/N PUB NO. | FILING DATE | PUB/PAT NO.        | INVENTORS             | TITLE  | STATUS   |
| P1030 US 001                                       | 61/715,746  | 10/18/2012  |                    | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed Dose Of A Clotting Factor | Inactive |
| P1030 US 002                                       | 61/759,856  | 02/01/2013  |                    | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed Dose Of A Clotting Factor | Inactive |
| P1030 US 003                                       | 61/760,000  | 02/01/2013  |                    | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed Dose Of A Clotting Factor | Inactive |
| P1030 US 004                                       | 14/436,667  | 10/18/2013  | US 2016-0296607 A1 | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed Dose Of A Clotting Factor | Pending  |
| P1030 AU 001                                       | 2013331000  | 10/18/2013  |                    | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed Dose Of A Clotting Factor | Pending  |
| P1030 CA 001                                       | 2,888,806   | 10/18/2013  |                    | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed Dose Of A Clotting Factor | Pending  |

| METHODS OF USING A FIXED DOSE OF A CLOTTING FACTOR<br>ASSIGNED TO: BIOGEN MA INC. |                       |                |                    |                       |   |          |
|---|-----------------------|----------------|--------------------|-----------------------|---|----------|
| BIOGEN<br>REF. NO.  | S/N<br>PUB NO.        | FILING<br>DATE | PUB/PAT<br>NO.     | INVENTORS             | TITLE   | STATUS   |
| P1030 EP 001  | 13847770.8            | 10/18/2013     | 2908847            | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed<br>Dose Of A Clotting Factor | Pending  |
| P1030 HK 001  | 16101669.0            | 02/16/2016     |                    | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed<br>Dose Of A Clotting Factor | Pending  |
| P1030 NZ 001  | 707110                | 10/18/2013     |                    | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed<br>Dose Of A Clotting Factor | Pending  |
| P1030 ZA 001  | 2015/03287            | 10/18/2013     |                    | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed<br>Dose Of A Clotting Factor | Pending  |
| P1030 WO 001  | PCT/US201<br>3/065772 | 10/18/2013     | WO/2014/06<br>3108 | Cobb; Diao; Jiang; Li | Methods Of Using A Fixed<br>Dose Of A Clotting Factor | Inactive |

| METHOD OF USING FIX POLYPEPTIDE<br>ASSIGNED TO: BIOGEN MA INC. |                |                |                  |   |                                       |          |
|--|----------------|----------------|------------------|---|---------------------------------------|----------|
| BIOGEN<br>REF. NO.   | S/N<br>PUB NO. | FILING<br>DATE | PUB/PAT<br>NO.   | INVENTORS                               | TITLE                                 | STATUS   |
| P1031 US 001   | 61/705,607     | 09/25/2012     |                  | Jiang; Peters; Pierce; Truex            | Methods Of Using A FIX<br>Polypeptide | Inactive |
| P1031 US 002   | 61/759,796     | 02/01/2013     |                  | Jiang; Peters; Pierce; Truex            | Method Of Using FIX<br>Polypeptide    | Inactive |
| P1031 US 003   | 61/800,163     | 03/15/2013     |                  | Jiang; Peters; Pierce; Truex;<br>Brader | Method Of Using FIX<br>Polypeptide    | Inactive |
| P1031 US 004   | 61/811,412     | 04/12/2013     |                  | Jiang; Peters; Pierce; Truex;<br>Brader | Method Of Using A FIX<br>Polypeptide  | Inactive |
| P1031 US 005   | 61/829,755     | 05/31/2013     |                  | Jiang; Peters; Pierce; Truex;<br>Brader | Method Of Using A FIX<br>Polypeptide  | Inactive |
| P1031 US 006   | 61/839,439     | 06/26/2013     |                  | Jiang; Peters; Pierce; Truex;<br>Brader | Method Of Using FIX<br>Polypeptide    | Inactive |
| P1031 US 007   | 61/863,859     | 08/08/2013     |                  | Jiang; Peters; Pierce; Truex;<br>Brader | Method Of Using FIX<br>Polypeptide    | Inactive |
| P1031 US 008   | 14/430,848     | 09/25/2013     | 2015-<br>0252345 | Jiang; Peters; Pierce; Truex;<br>Brader | Method Of Using FIX<br>Polypeptide    | Pending  |

| METHOD OF USING FIX POLYPEPTIDE |                   |             |                |                                      |                                   |          |
|---------------------------------|-------------------|-------------|----------------|--------------------------------------|-----------------------------------|----------|
| ASSIGNED TO: BIOGEN MA INC.     |                   |             |                |                                      |                                   |          |
| BIOGEN REF. NO.                 | S/N PUB NO.       | FILING DATE | PUB/PAT NO.    | INVENTORS                            | TITLE                             | STATUS   |
| P1031 EP 001                    | 13842864.4        | 09/25/2013  | 2900328        | Jiang; Peters; Pierce; Truex; Brader | Methods Of Using FIX Polypeptide  | Pending  |
| P1031 HK 001                    | 16101264.9        | 02/03/2016  |                | Jiang; Peters; Pierce; Truex; Brader | Methods Of Using FIX Polypeptide  | Pending  |
| P1031 WO 001                    | PCT/US2013/061747 | 09/25/2013  | WO/2014/052490 | Jiang; Peters; Pierce; Truex; Brader | Methods Of Using FIX Polypeptides | Inactive |
| P1031 TW 001                    | 102134557         | 09/25/2013  |                | Jiang; Peters; Pierce; Truex; Brader | Method Of Using FIX Polypeptide   | Pending  |

| METHODS OF USING FVIII POLYPEPTIDE |             |             |             |                                  |                                    |          |
|------------------------------------|-------------|-------------|-------------|----------------------------------|------------------------------------|----------|
| ASSIGNED TO: BIOGEN MA INC.        |             |             |             |                                  |                                    |          |
| BIOGEN REF. NO.                    | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS                        | TITLE                              | STATUS   |
| P1035 US 001                       | 61/720,356  | 10/30/2012  |             | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Inactive |
| P1035 US 002                       | 61/759,880  | 02/01/2013  |             | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Inactive |
| P1035 US 003                       | 61/800,293  | 03/15/2013  |             | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Inactive |
| P1035 US 004                       | 61/817,085  | 04/29/2013  |             | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Inactive |
| P1035 US 005                       | 61/829,884  | 05/31/2013  |             | Jiang; Li; Neelakantan; Nestorov | Method Of Using FVIII Polypeptide  | Inactive |
| P1035 US 006                       | 61/839,477  | 06/26/2013  |             | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Inactive |
| P1035 US 007                       | 61/863,860  | 08/08/2013  |             | Jiang; Li; Neelakantan; Nestorov | Method Of Using FVIII Polypeptide  | Inactive |
| P1035 US 008                       | 61/876,927  | 09/12/2013  |             | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Inactive |
| P1035 US 009                       | 61/879,955  | 09/19/2013  |             | Jiang; Li; Neelakantan; Nestorov | Method Of Using FVIII Polypeptide  | Inactive |



| METHODS OF USING FVIII POLYPEPTIDE |                   |             |                |                                  |                                    |          |
|------------------------------------|-------------------|-------------|----------------|----------------------------------|------------------------------------|----------|
| ASSIGNED TO: BIOGEN MA INC.        |                   |             |                |                                  |                                    |          |
| BIOGEN REF. NO.                    | S/N PUB NO.       | FILING DATE | PUB/PAT NO.    | INVENTORS                        | TITLE                              | STATUS   |
| P1035 US 010                       | 14/439,435        | 10/30/2013  | 2015-0266944   | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Pending  |
| P1035 EP 001                       | 13852306.3        | 10/30/2013  | 2914293        | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Pending  |
| P1035 HK 001                       | 16102668.9        | 03/08/2016  |                | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Pending  |
| P1035 WO 001                       | PCT/US2013/067613 | 10/30/2013  | WO/2014/070953 | Jiang; Li; Neelakantan; Nestorov | Methods Of Using FVIII Polypeptide | Inactive |

| ON-COLUMN VIRAL INACTIVATION METHODS |                   |             |                    |                    |                                      |          |
|--------------------------------------|-------------------|-------------|--------------------|--------------------|--------------------------------------|----------|
| ASSIGNED TO: BIOGEN MA INC.          |                   |             |                    |                    |                                      |          |
| BIOGEN REF. NO.                      | S/N PUB NO.       | FILING DATE | PUB/PAT NO.        | INVENTORS          | TITLE                                | STATUS   |
| P1053 US 001                         | 61/882,488        | 09/25/2013  |                    | Bolton; Selvitelli | On-Column Viral Inactivation Methods | Inactive |
| P1053 US 002                         | 62/028,657        | 07/24/2014  |                    | Bolton; Selvitelli | On-Column Viral Inactivation Methods | Inactive |
| P1053 US 003                         | 15/024,988        | 09/25/2014  | US 2016-0347788 A1 | Bolton; Selvitelli | On-Column Viral Inactivation Methods | Pending  |
| P1053 EP 001                         | 14849291.1        | 09/25/2014  | 3048899            | Bolton; Selvitelli | On-Column Viral Inactivation Methods | Pending  |
| P1053 WO 001                         | PCT/US2014/057524 | 09/25/2014  | WO2015/048330 A2   | Bolton; Selvitelli | On-Column Viral Inactivation Methods | Inactive |

| FACTOR IX-Fc POLYPEPTIDE FORMULATIONS |             |             |             |           |                                       |          |
|---------------------------------------|-------------|-------------|-------------|-----------|---------------------------------------|----------|
| ASSIGNED TO: BIOGEN MA INC.           |             |             |             |           |                                       |          |
| BIOGEN REF. NO.                       | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS | TITLE                                 | STATUS   |
| P1054 US 001                          | 61/794,874  | 03/15/2013  |             | Brader    | Factor IX-Fc Polypeptide Formulations | Inactive |

**FACTOR IX-Fc POLYPEPTIDE FORMULATIONS  
ASSIGNED TO: BIOGEN MA INC.**

| <b>BIOGEN REF. NO.</b> | <b>S/N PUB NO.</b> | <b>FILING DATE</b> | <b>PUB/PAT NO.</b> | <b>INVENTORS</b> | <b>TITLE</b>                          | <b>STATUS</b> |
|------------------------|--------------------|--------------------|--------------------|------------------|---------------------------------------|---------------|
| P1054 US 002           | 14/776,125         | 03/14/2014         | 2016-0000888       | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 AR 001           | P140101135         | 03/14/2014         | 095527             | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 AU 001           | 2014228938         | 03/14/2014         |                    | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 CA 001           | 2,899,089          | 03/14/2014         |                    | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 CL 001           | 2015-2719          | 03/14/2014         |                    | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 CO 001           | 15-202,814         | 03/14/2014         |                    | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 EA 001           | 201591421          | 03/14/2014         |                    | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 EP 001           | 14764659.0         | 03/14/2014         | 2968498            | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 GC 001           | 2014/26810         | 3/16/2014          |                    | Brader           | Factor IX-Fc Polypeptide Formulations | Pending       |
| P1054 HK 001           | 16108683.7         |                    |                    | Brader           | Factor IX-Fc Polypeptide Formulations | Pending       |
| P1054 JP 001           | 2016-502963        | 03/14/2014         |                    | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 PH 001           | 1-2015-501854      | 03/14/2014         |                    | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 SG 001           | 11201505926V       | 03/14/2014         |                    | Brader           | Factor IX Polypeptide Formulations    | Pending       |
| P1054 TW 001           | 103109611          | 3/14/2014          | 201524514          | Brader           | Factor IX-Fc Polypeptide Formulations | Pending       |
| P1054 UY 001           | 35,463             | 3/14/2014          |                    | Brader           | Factor IX-Fc Polypeptide Formulations | Pending       |
| P1054 VE 001           | 2014-              | 3/14/2014          |                    | Brader           | Factor IX-Fc Polypeptide              | Pending       |

| FACTOR IX-FC POLYPEPTIDE FORMULATIONS |                 |             |                |           |                                    |          |
|---------------------------------------|-----------------|-------------|----------------|-----------|------------------------------------|----------|
| ASSIGNED TO: BIOGEN MA INC.           |                 |             |                |           |                                    |          |
| BIOGEN REF. NO.                       | S/N PUB NO.     | FILING DATE | PUB/PAT NO.    | INVENTORS | TITLE                              | STATUS   |
|                                       | 000382          |             |                |           | Formulations                       |          |
| P1054 WO 001                          | PCT/US14/029010 | 3/14/2014   | WO/2014/144617 | Brader    | Factor IX Polypeptide Formulations | Inactive |

| THROMBIN CLEAVABLE LINKER   |                   |             |                    |                        |                           |         |
|-----------------------------|-------------------|-------------|--------------------|------------------------|---------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC. |                   |             |                    |                        |                           |         |
| BIOGEN REF. NO.             | S/N PUB NO.       | FILING DATE | PUB/PAT NO.        | INVENTORS              | TITLE                     | STATUS  |
| P1099 US 001                | 61/840,864        | 6/28/2013   |                    | Chhbra;<br>Kulman; Liu | Thrombin Cleavable Linker | Expired |
| P1099 US 002                | 14/895,264        | 6/27/2014   | US 2016-0229903 A1 | Chhbra;<br>Kulman; Liu | Thrombin Cleavable Linker | Pending |
| P1099 EP 001                | 14818050.8        | 6/27/2014   | EP3013359A1        | Chhbra;<br>Kulman; Liu | Thrombin Cleavable Linker | Pending |
| P1099 WO 001                | PCT/US2014/044718 | 6/27/2014   | WO 2014/210547     | Chhbra;<br>Kulman; Liu | Thrombin Cleavable Linker | Expired |
| P1099 TW 001                | 103122510         | 6/30/2014   |                    | Chhbra;<br>Kulman; Liu | Thrombin Cleavable Linker | Pending |

| RECOMBINANT FVIII PROTEINS AND USES THEREOF |             |             |                    |                |   |         |
|---|-------------|-------------|--------------------|----------------|---|---------|
| ASSIGNED TO: BIOGEN MA INC.                 |             |             |                    |                |   |         |
| BIOGEN REF. NO.                             | S/N PUB NO. | FILING DATE | PUB/PAT NO.        | INVENTORS      | TITLE                                       | STATUS  |
| P1101 US 001                                | 61/866,017  | 8/14/2013   |                    | Peters; Kulman | Recombinant FVIII Proteins and Uses Thereof | Expired |
| P1101 US 003                                | 14/912,050  | 8/14/2014   | US 2016-0311885 A1 | Peters; Kulman | Recombinant FVIII Proteins and Uses Thereof | Pending |
| P1101 EP 001                                | 14835927.6  | 8/14/2014   | EP3033098 A1       | Peters; Kulman | Recombinant FVIII Proteins and Uses Thereof | Pending |

| RECOMBINANT FVIII PROTEINS AND USES THEREOF |                       |             |                |                |   |         |
|---|-----------------------|-------------|----------------|----------------|---|---------|
| ASSIGNED TO: BIOGEN MA INC.                 |                       |             |                |                |   |         |
| BIOGEN REF. NO.                             | S/N PUB NO.           | FILING DATE | PUB/PAT NO.    | INVENTORS      | TITLE                                       | STATUS  |
| P1101 WO 001                                | PCT/US2014/05114<br>7 | 8/14/2014   | WO 2015/023894 | Peters; Kulman | Recombinant FVIII Proteins and Uses Thereof | Expired |

| ANTI-FVIII ANTIBODIES OR USES THEREOF |                       |             |                       |           |                                       |         |
|---------------------------------------|-----------------------|-------------|-----------------------|-----------|---------------------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC.           |                       |             |                       |           |                                       |         |
| BIOGEN REF. NO.                       | S/N PUB NO.           | FILING DATE | PUB/PAT NO.           | INVENTORS | TITLE                                 | STATUS  |
| P1116 US 001                          | 61/834,828            | 6/13/2013   |                       | Kulman    | Anti-FVIII Antibodies or Uses Thereof | Expired |
| P1116 US 002                          | 61/913,143            | 12/6/2013   |                       | Kulman    | Anti-FVIII Antibodies or Uses Thereof | Expired |
| P1116US003                            | 14/894,155            | 6/13/2014   | US 2016-0130361<br>A1 | Kulman    | Anti-FVIII Antibodies or Uses Thereof | Pending |
| P1116 EP 001                          | 14811056.2            | 6/13/2014   | EP3008085 A2          | Kulman    | Anti-FVIII Antibodies or Uses Thereof | Pending |
| P1116 HK 001                          | 16111495.9            | 10/03/2016  |                       | Kulman    | Anti-FVIII Antibodies or Uses Thereof | Pending |
| P1116 WO 001                          | PCT/US2014/04237<br>4 | 6/13/2014   | WO 2014/201400        | Kulman    | Anti-FVIII Antibodies or Uses Thereof | Expired |

| PURIFICATION OF CHIMERIC FVIII MOLECULES |                |             |             |           |  |         |
|--|----------------|-------------|-------------|-----------|--|---------|
| ASSIGNED TO: BIOGEN MA INC.              |                |             |             |           |  |         |
| BIOGEN REF. NO.                          | S/N PUB NO.    | FILING DATE | PUB/PAT NO. | INVENTORS | TITLE  | STATUS  |
| P1155 US 001                             | 61/863,8<br>10 | 8/8/2013    |             | Zhu       | Purification and Characterization of a Novel Class of Long-Acting Factor VIII Molecules Containing a VWF Fragment, an Fc Domain, and XTEN Polypeptides | Expired |
| P1155 US 002                             | 14/910,5       | 8/8/2014    | US 2016-    | Zhu       | Purification of chimeric Factor VIII Molecules   | Pending |

| PURIFICATION OF CHIMERIC FVIII MOLECULES |                           |             |                       |           |  |         |
|--|---------------------------|-------------|-----------------------|-----------|--|---------|
| ASSIGNED TO: BIOGEN MA INC.              |                           |             |                       |           |  |         |
| BIOGEN REF. NO.                          | S/N PUB NO.               | FILING DATE | PUB/PAT NO.           | INVENTORS | TITLE  | STATUS  |
|  | 55                        |             | 0185817 A1            |           |  |         |
| P1155 EP 001                             | 1483492<br>7.7            | 8/8/2014    | EP3043813<br>A2       | Zhu       | Purification of chimeric Factor VIII Molecules | Pending |
| P1155 WO 001                             | PCT/US2<br>014/0504<br>11 | 8/8/2014    | WO<br>2015/02142<br>3 | Zhu       | Purification of chimeric Factor VIII Molecules | Expired |

| POPULATION PHARMACOKINETICS TOOLS AND USES THEREOF |                       |             |                        |           |  |          |
|--|-----------------------|-------------|------------------------|-----------|--|----------|
| ASSIGNED TO: BIOGEN MA INC.                        |                       |             |                        |           |  |          |
| BIOGEN REF. NO.                                    | S/N PUB NO.           | FILING DATE | PUB/PAT NO.            | INVENTORS | TITLE  | STATUS   |
| P1156 US 001                                       | 61/913,149            | 12/06/2013  |                        | Jiang     | Population Pharmacokinetics Tools And Uses Thereof | Inactive |
| P1156 US 002                                       | 61/934,286            | 01/31/2014  |                        | Jiang     | Population Pharmacokinetics Tools And Uses Thereof | Inactive |
| P1156 US 003                                       | 61/944,467            | 02/25/2014  |                        | Jiang     | Population Pharmacokinetics Tools And Uses Thereof | Inactive |
| P1156 US 004                                       | 15/101,756            | 12/06/2014  | US 2016-<br>0306945 A1 | Jiang     | Population Pharmacokinetics Tools And Uses Thereof | Pending  |
| P1156 EP 001                                       | 14867154.8            | 12/06/2014  | EP3082848<br>A1        | Jiang     | Population Pharmacokinetics Tools And Uses Thereof | Pending  |
| P1156 WO 001                                       | PCT/US2014<br>/068956 | 12/06/2014  | WO2015/085<br>276 A1   | Jiang     | Population Pharmacokinetics Tools And Uses Thereof | Inactive |

| FACTOR VIII POLYPEPTIDE FORMULATION |  |  |  |  |  |  |
|-------------------------------------|--|--|--|--|--|--|
| ASSIGNED TO: BIOGEN MA INC.         |  |  |  |  |  |  |

| BOGEN REF. NO. | S/N PUB NO.    | FILING DATE | PUB/PAT NO.    | INVENTORS                   | TITLE   | STATUS   |
|----------------|----------------|-------------|----------------|-----------------------------|---|----------|
| P1166 US 001   | 61/897,742     | 10/30/2013  |                | Maloney                     | Factor VIII Polypeptide Formulation             | Inactive |
| P1166 US 002   | 14/213,180     | 03/14/2014  | 2014-0308280   | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Allowed  |
| P1166 WO 001   | PCT/US14/29354 | 03/14/2014  | WO/2014/144795 | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Inactive |
| P1166 AR 001   | P140101222     | 03/14/2014  | 095597         | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 AU 001   | 2014228506     | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 CA 001   | 2,899,737      | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 CL 001   | 2720-2015      | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 CO 001   | 15-202.828     | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 EA 001   | 201591439      | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 EP 002   | 14725816.4     | 03/14/2014  | 2968477        | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 GC 001   | 2014/26836     | 03/16/2014  |                | Maloney                     | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 HK 001   | 16108672       | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 JP 001   | 2016-503069    | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Methods Of Using FVIII Polypeptide Formulations | Pending  |
| P1166 PH 001   | 1-2015-501801  | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 SG 001   | 11201505924T   | 03/14/2014  |                | Maloney; Abdul-Fattah; Gage | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 TW 001   | 103109616      | 03/14/2014  | 201501722      | Maloney                     | Factor VIII Polypeptide Formulations            | Pending  |
| P1166 UY       | 35.462         | 03/14/2014  |                | Maloney                     | Factor VIII Polypeptide                         | Pending  |

| FACTOR VIII POLYPEPTIDE FORMULATION |             |             |             |           |                                      |         |
|-------------------------------------|-------------|-------------|-------------|-----------|--------------------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC.         |             |             |             |           |                                      |         |
| BIOGEN REF. NO.                     | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS | TITLE                                | STATUS  |
| 001                                 |             |             |             |           | Formulations                         |         |
| P1166 VE 001                        | 2014-000384 | 03/14/2014  |             | Maloney   | Factor VIII Polypeptide Formulations | Pending |

| PROCOAGULANT FUSION COMPOUND |                   |             |                    |           |                              |         |
|------------------------------|-------------------|-------------|--------------------|-----------|------------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC.  |                   |             |                    |           |                              |         |
| BIOGEN REF. NO.              | S/N PUB NO.       | FILING DATE | PUB/PAT NO.        | INVENTORS | TITLE                        | STATUS  |
| P1173 US 001                 | 61/901,973        | 11/8/2013   |                    | Thorm     | Procoagulant Fusion Compound | Expired |
| P1173 US 002                 | 61/981,446        | 4/18/2014   |                    | Thorm     | Procoagulant Fusion Compound | Expired |
| P1173 US 003                 | 15/035,145        | 11/7/2014   | US 2016-0289273 A1 | Thorm     | Procoagulant Fusion Compound | Pending |
| P1173 EP 001                 | 14859449.2        | 11/7/2014   | EP3065769 A1       | Thorm     | Procoagulant Fusion Compound | Pending |
| P1173 WO 001                 | PCT/US2014/064541 | 11/7/2014   | WO 2015/070014     | Thorm     | Procoagulant Fusion Compound | Expired |

| OPTIMIZED FACTOR IX GENE    |                   |             |                |                  |                          |         |
|-----------------------------|-------------------|-------------|----------------|------------------|--------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC. |                   |             |                |                  |                          |         |
| BIOGEN REF. NO.             | S/N PUB NO.       | FILING DATE | PUB/PAT NO.    | INVENTORS        | TITLE                    | STATUS  |
| P1210 US 001                | 62/019,069        | 06/30/2014  |                | Tan; Peters      | Optimized Factor IX Gene | Expired |
| P1210 US 002                | 62/168,565        | 05/29/2015  |                | Tan; Peters; Liu | Optimized Factor IX Gene | Expired |
| P1210 US 003                | 15/323,302        | 12/30/2016  |                | Tan; Peters; Liu | Optimized Factor IX Gene | Pending |
| P1210 EP 001                | 15814881.7        | 6/30/2015   |                | Tan; Peters; Liu | Optimized Factor IX Gene | Pending |
| P1210 WO 001                | PCT/US2015/038678 | 6/30/2015   | WO 2016/004113 | Tan; Peters; Liu | Optimized Factor IX Gene | Pending |

FACTOR IX FUSION PROTEINS AND METHODS OF MAKING AND USING SAME

| ASSIGNED TO: BIOGEN MA INC.             |                   |             |             |   |  |         |
|---|-------------------|-------------|-------------|---|--|---------|
| BIOGEN REF. NO.                         | S/N PUB NO.       | FILING DATE | PUB/PAT NO. | INVENTORS   | TITLE  | STATUS  |
| P1231 US 001                            | 62/200,590        | 08/03/2015  |             | Liu; Van Der Flier; Light; Chhabra; Liu; Peters; Kulman         | Factor IX Fusion Proteins And Methods of Making And Using Same | Expired |
| P1231 US 002                            | 62/200,594        | 08/03/2015  |             | Liu; Van Der Flier; Light; Chhabra; Liu; Peters; Kulman         | Factor IX Fusion Proteins And Methods of Making And Using Same | Expired |
| P1231 US 003                            | 62/281,993        | 01/22/2016  |             | Liu; Van Der Flier; Light; Chhabra; Liu; Peters; Kulman         | Factor IX Fusion Proteins And Methods of Making And Using Same | Pending |
| P1231 US 004                            | 62/281,998        | 01/22/2016  |             | Liu; Van Der Flier; Light; Chhabra; Liu; Peters; Kulman         | Factor IX Fusion Proteins And Methods of Making And Using Same | Pending |
| P1231 AR 001                            | P160102376        | 08/03/2016  |             | Liu; Van Der Flier; Light; Chhabra; Liu; Peters; Kulman; Ismail | Factor IX Fusion Proteins And Methods of Making And Using Same | Pending |
| P1231 GC 001                            | 2016/31815        | 08/03/2016  |             | Liu; Van Der Flier; Light; Chhabra; Liu; Peters; Kulman; Ismail | Factor IX Fusion Proteins And Methods of Making And Using Same | Pending |
| P1231 PC 001                            | PCT/US2016/045401 | 08/03/2016  |             | Liu; Van Der Flier; Light; Chhabra; Liu; Peters; Kulman; Ismail | Factor IX Fusion Proteins And Methods of Making And Using Same | Pending |
| P1231 TW 001                            | 105124637         | 08/03/2016  |             | Liu; Van Der Flier; Light; Chhabra; Liu; Peters; Kulman; Ismail | Factor IX Fusion Proteins And Methods of Making And Using Same | Pending |
| VECTORS COMPRISING OPTIMIZED FVIII GENE |                   |             |             |   |  |         |
| ASSIGNED TO: BIOGEN MA INC.             |                   |             |             |   |  |         |
| BIOGEN REF. NO.                         | S/N PUB NO.       | FILING DATE | PUB/PAT NO. | INVENTORS   | TITLE  | STATUS  |
| P1237 US 001                            | 62/037,971        | 8/15/2014   |             | Tan; Peters   | Vectors Comprising Optimized FVIII Gene                        | Expired |



| OPTIMIZED FVIII GENES       |             |             |             |           |                             |         |
|-----------------------------|-------------|-------------|-------------|-----------|-----------------------------|---------|
| ASSIGNED TO: BIOGEN MA INC. |             |             |             |           |                             |         |
| BIOGEN REF. NO.             | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS | TITLE                       | STATUS  |
| P1289 US 001                | 62/289,696  | 02/01/2016  |             | Tan; Liu  | Optimized Factor VIII Genes | Pending |
| P1289 US 002                | 62/409,739  | 10/18/2016  |             | Tan; Liu  | Optimized FVIII Genes       | Pending |

| BISPECIFIC ANTIBODIES BINDING TO COAGULATION FACTOR IX AND COAGULATION FACTOR X |             |             |             |                       |   |         |
|---|-------------|-------------|-------------|-----------------------|---|---------|
| ASSIGNED TO: BIOGEN MA INC.,  |             |             |             |                       |   |         |
| BIOGEN REF. NO.   | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS             | TITLE   | STATUS  |
| P1315 US 001  | 62/425,921  | 11/23/2016  |             | Leksa; Pearse; Peters | Bispecific Antibodies Binding to Coagulation Factor IX And Coagulation Factor X | Pending |

## PATENT FAMILIES CO-OWNED BY AMUNIX OPERATING INC AND BIOGEN MA INC.

| FACTOR VIII COMPOSITIONS AND METHODS OF MAKING AND USING SAME |                       |             |                        |  |   |         |  |
|---|-----------------------|-------------|------------------------|--|---|---------|--|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.         |                       |             |                        |  |   |         |  |
| BIOGEN REF. NO.   | S/N PUB NO.           | FILING DATE | PUB/PAT NO.            | INVENTORS  | TITLE   | STATUS  |  |
| X0692 US 001<br>734.101                                       | 61/599,400            | 2/15/2012   |                        | Schellenberger; Chang; Vartfaj; Ding;<br>Silverman; Wang; Spink; Stemmer;<br>Geething; Kulman; Liu; Toby; Jiang;<br>Peters | Factor VIII Compositions<br>and Methods of Making and<br>Using Same | Expired |  |
| X0692 US 002<br>734.301                                       | 14/379,192            | 7/11/2012   | US 2015-<br>0158929 A1 | Schellenberger; Chang; Vartfaj; Ding;<br>Silverman; Wang; Spink; Stemmer;<br>Geething; Kulman; Liu; Toby; Jiang;<br>Peters | Factor VIII Compositions<br>and Methods of Making and<br>Using Same | Pending |  |
| X0692 WO 001<br>734.601                                       | PCT/US2012/04<br>6326 | 7/11/2012   | WO/2013/12261<br>7     | Schellenberger; Chang; Vartfaj; Ding;<br>Silverman; Wang; Spink; Stemmer;<br>Geething; Kulman; Liu; Toby; Jiang;<br>Peters | Factor VIII Compositions<br>and Methods of Making and<br>Using Same | Expired |  |
| X0692 AU 001  | AU 2012327217         | 7/11/2012   | AU 2012327217          | Schellenberger; Chang; Vartfaj; Ding;<br>Silverman; Wang; Spink; Stemmer;<br>Geething; Kulman; Liu; Toby; Jiang;<br>Peters | Factor VIII Compositions<br>and Methods of Making and<br>Using Same | Issued  |  |
| X0692 AU 002<br>734.6811                                      | AU 2016210689         | 8/4/2016    |                        | Schellenberger; Chang; Vartfaj; Ding;<br>Silverman; Wang; Spink; Stemmer;<br>Geething; Kulman; Liu; Toby; Jiang;<br>Peters | Factor VIII Compositions<br>and Methods of Making and<br>Using Same | Pending |  |
| X0692 BR 001  | BR11201402069<br>4-5  | 7/11/2012   |                        | Schellenberger; Chang; Vartfaj; Ding;<br>Silverman; Wang; Spink; Stemmer;<br>Geething; Kulman; Liu; Toby; Jiang;<br>Peters | Factor VIII Compositions<br>and Methods of Making and<br>Using Same | Pending |  |
| X0692 CA 001  | 2864904               | 7/11/2012   |                        | Schellenberger; Chang; Vartfaj; Ding;<br>Silverman; Wang; Spink; Stemmer;<br>Geething; Kulman; Liu; Toby; Jiang;<br>Peters | Factor VIII Compositions<br>and Methods of Making and<br>Using Same | Pending |  |
| X0692 CL 001  | 2166-2014             | 7/11/2012   |                        | Schellenberger; Chang; Vartfaj; Ding;<br>Silverman; Wang; Spink; Stemmer;<br>Geething; Kulman; Liu; Toby; Jiang;<br>Peters | Factor VIII Compositions<br>and Methods of Making and<br>Using Same | Pending |  |

| FACTOR VIII COMPOSITIONS AND METHODS OF MAKING AND USING SAME |                   |             |                  |   |   |         |
|---|-------------------|-------------|------------------|---|---|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.         |                   |             |                  |   |   |         |
| BIOGEN REF. NO.   | S/N PUB NO.       | FILING DATE | PUB/PAT NO.      | INVENTORS   | TITLE   | STATUS  |
| X0692 CN 001  | 201280072346.1    | 7/11/2012   |                  | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 CO 001  | 14-185.382        | 7/11/2012   |                  | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 EA 001  | 201491470         | 7/11/2012   |                  | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 EP 001  | 12868427.1        | 7/11/2012   | EP2814840        | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 HK 001  | 15104912.0        | 7/11/2012   |                  | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 ID 001  | P-00201405454     | 7/11/2012   |                  | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 IL 001  | 234108            | 7/11/2012   |                  | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 IN 001  | 7658/DE/IN/P/2014 | 7/11/2012   |                  | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 JP 001  | 2014-557620       | 7/11/2012   | JP,2015-512876,A | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |

| FACTOR VIII COMPOSITIONS AND METHODS OF MAKING AND USING SAME |                  |             |             |   |   |         |
|---|------------------|-------------|-------------|---|---|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.         |                  |             |             |   |   |         |
| BIOGEN REF. NO.   | S/N PUB NO.      | FILING DATE | PUB/PAT NO. | INVENTORS   | TITLE   | STATUS  |
| X0692 JP 002  | 2015-138941      | 7/10/2015   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 KR 001  | 2014-7025699     | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 MX 001  | MX/a/2014/009872 | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 MY 001  | P12014002385     | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 NZ 001  | 628800           | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 NZ 002<br>734.7911                                      | 723509           | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 PH 001  | 1-2014-501849    | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 SG 001  | 11201404885R     | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Geething; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 SG 002<br>734.8211                                      | 10201606783R     | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer;  | Factor VIII Compositions and Methods of Making and            | Pending |

| FACTOR VIII COMPOSITIONS AND METHODS OF MAKING AND USING SAME |             |             |             |   |   |         |
|---|-------------|-------------|-------------|---|---|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.         |             |             |             |   |   |         |
| BIOGEN REF. NO.   | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS   | TITLE   | STATUS  |
| X0692 TH 001  | 1401004740  | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Greeting; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 UA 001  | a201409190  | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Greeting; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |
| X0692 ZA 001  | 2014/06170  | 7/11/2012   |             | Schellenberger; Chang; Vartfaj; Ding; Silverman; Wang; Spink; Stemmer; Greeting; Kulman; Liu; Toby; Jiang; Peters | Factor VIII Compositions and Methods of Making and Using Same | Pending |

| FACTOR VIII COMPLEX WITH XTEN AND VON WILLEBRAND FACTOR PROTEIN, AND USES THEREOF |             |             |             |                                      |   |         |
|---|-------------|-------------|-------------|--------------------------------------|---|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.                             |             |             |             |                                      |   |         |
| BIOGEN REF. NO.   | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS                            | TITLE   | STATUS  |
| P0962 US 001<br>743.101   | 61/670,401  | 7/11/2012   |             | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Expired |
| P0962 US 002<br>743.102   | 61/759,819  | 2/1/2013    |             | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Expired |
| P0962 US 003<br>743.103   | 61/801,504  | 3/15/2013   |             | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Expired |
| P0962 US 004<br>743.104   | 61/801,544  | 3/15/2013   |             | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Expired |

| FACTOR VIII COMPLEX WITH XTEN AND VON WILLEBRAND FACTOR PROTEIN, AND USES THEREOF |                       |             |                        |   |   |         |  |
|---|-----------------------|-------------|------------------------|---|---|---------|--|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.                             |                       |             |                        |   |   |         |  |
| BIOGEN REF. NO.   | S/N PUB NO.           | FILING DATE | PUB/PAT NO.            | INVENTORS                               | TITLE   | STATUS  |  |
| P0962 US 005<br>743.105   | 61/827,158            | 5/24/2013   |                        | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Expired |  |
| P0962 US 006<br>743.106   | 61/840,811            | 6/28/2013   |                        | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Expired |  |
| P0962 WO 001<br>743.601   | PCT/US2013<br>/049989 | 7/10/2013   | WO/2014/0118<br>19     | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Expired |  |
| P0962 US 007<br>743.831   | 14/413,765            | 7/10/2013   | US 2015-<br>0266943 A1 | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |  |
| P0962 AR 001  | P130102467            | 7/11/2013   |                        | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |  |
| P0962 TW 001  | 102124926             | 7/11/2013   |                        | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |  |
| P0962 AE 001  | 48/2015               | 7/10/2013   |                        | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |  |
| P0962 AU 001  | 2013290173            | 7/10/2013   |                        | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |  |
| P0962 BR 001  | BR11201500<br>0267-6  | 7/10/2013   |                        | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |  |
| P0962 CA 001  | 2878679               | 7/10/2013   |                        | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |  |
| P0962 CL 001  | 60-2015               | 7/10/2013   |                        | Chhabra; Liu; Change;                   | Factor VIII Complex With Xten   | Pending |  |

| FACTOR VIII COMPLEX WITH XTEN AND VON WILLEBRAND FACTOR PROTEIN, AND USES THEREOF |                    |             |                  |                                      |   |         |  |
|---|--------------------|-------------|------------------|--------------------------------------|---|---------|--|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.                             |                    |             |                  |                                      |   |         |  |
| BIOGEN REF. NO.   | S/N PUB NO.        | FILING DATE | PUB/PAT NO.      | INVENTORS                            | TITLE   | STATUS  |  |
|   |                    |             |                  | Peters; Kulman                       | And Von Willebrand Factor Protein, And Uses Thereof                               |         |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof |         |  |
| P0962 CN 001  | 20138004691<br>4.5 | 7/10/2013   |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 CO 001  | 15-008.422         | 7/10/2013   |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 EA 001  | 201590198          | 7/10/2013   |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 EP 001  | 13816031.2         | 7/10/2013   |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 HK 001  | 15112122.9         | 12/08/2015  |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 IL 001  | 236412             | 7/10/2013   |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 IN 001  | 105/DELN/P/2015    | 7/10/2013   |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 JP 001  | 2015-521785        | 7/10/2013   | JP,2015-527882.A | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 KR 001  | 2015-7003523       | 7/10/2013   |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
|   |                    |             |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |
| P0962 MX 001  | MX/a/2015/000397   | 7/10/2013   |                  | Chhabra; Liu; Change; Peters; Kulman | Factor VIII Complex With Xten And Von Willebrand Factor Protein, And Uses Thereof | Pending |  |

| FACTOR VIII COMPLEX WITH XTEN AND VON WILLEBRAND FACTOR PROTEIN, AND USES THEREOF |                   |             |             |   |   |         |
|---|-------------------|-------------|-------------|---|---|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.                             |                   |             |             |   |   |         |
| BIOGEN REF. NO.   | S/N PUB NO.       | FILING DATE | PUB/PAT NO. | INVENTORS                               | TITLE   | STATUS  |
|   |                   |             |             |   | Protein, And Uses Thereof   |         |
|   |                   |             |             | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |
| P0962 NZ 001  | 703366            | 7/10/2013   |             | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |
| P0962 PH 001  | 1-2015-<br>500039 | 7/10/2013   |             | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |
| P0962 SG 001  | 11201500045<br>R  | 7/10/2013   |             | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |
| P0962 TH 001  | 1501000097        | 7/10/2013   |             | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |
| P0962 UA 001  | a201500228        | 7/10/2013   |             | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |
| P0962 ZA 001  | 2015/00162        | 7/10/2013   |             | Chhabra; Liu; Change;<br>Peters; Kulman | Factor VIII Complex With Xten<br>And Von Willebrand Factor<br>Protein, And Uses Thereof | Pending |

| FACTOR VIII-XTEN FUSIONS AND USES THEREOF             |             |             |             |  |  |         |
|---|-------------|-------------|-------------|--|--|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC. |             |             |             |  |  |         |
| BIOGEN REF. NO.                                       | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS  | TITLE  | STATUS  |
| P1154 US 001<br>745.101                               | 61/866,016  | 8/14/2013   |             | Liu; Chang; Kulman;<br>Schellenberger; Jiang; Peters;<br>Chhabra | Factor VIII-Xten Fusions<br>And Uses Thereof | Expired |
| P1154 US 003<br>745.301                               | 14/912,047  | 8/14/2014   | -           | Liu; Chang; Kulman;<br>Schellenberger; Jiang; Peters;<br>Chhabra | Factor VIII-Xten Fusions<br>And Uses Thereof | Pending |



|              |                   |           |                |  |   |         |
|--------------|-------------------|-----------|----------------|--|---|---------|
| P1154 WO 001 | PCT/US2014/051144 | 8/14/2014 | WO/2015/023891 | Liu; Chang; Kulman; Schellenberger, Jiang; Peters; Chhabra | Factor VIII-Xten Fusions And Uses Thereof | Expired |
| P1154 TW 001 | 103127922         | 8/14/2014 |                | Liu; Chang; Kulman; Schellenberger, Jiang; Peters; Chhabra | Factor VIII-Xten Fusions And Uses Thereof | Pending |
| P1154 EP 001 | 14835828.6        | 8/14/2014 |                | Liu; Chang; Kulman; Schellenberger, Jiang; Peters; Chhabra | Factor VIII-Xten Fusions And Uses Thereof | Pending |

| THROMBIN CLEAVABLE LINKER WITH XTEN AND ITS USES THEREOF |                  |             |                |                      |  |         |
|--|------------------|-------------|----------------|----------------------|--|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.    |                  |             |                |                      |  |         |
| BIOGEN REF. NO.  | S/N PUB NO.      | FILING DATE | PUB/PAT NO.    | INVENTORS            | TITLE  | STATUS  |
| P1100 US 001   | 61/840,872       | 6/28/2013   |                | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Expired |
| P1100 WO 001   | PCT/US2014/04731 | 6/27/2014   | WO/2014/210558 | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Expired |
| P1100 US 002   | US 14/894,108    | 6/27/2014   | -              | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 AU 001   | 2014302100       | 6/27/2014   |                | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 BR 001   | BR112015031194-6 | 6/27/2014   |                | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 CA 001   | 2,913,078        | 6/27/2014   |                | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 CL 001   | 3710-2015        | 6/27/2014   |                | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 CN 001   | 201480029781.5   | 6/27/2014   |                | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 CO 001   | 15-276.531       | 6/27/2014   |                | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 EA 001   | 201592022        | 6/27/2014   |                | Chhabra; Kulman; Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |

| THROMBIN CLEAVABLE LINKER WITH XTEN AND ITS USES THEREOF |                      |             |             |                         |  |         |
|--|----------------------|-------------|-------------|-------------------------|--|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC.    |                      |             |             |                         |  |         |
| BIOGEN REF. NO.  | S/N PUB NO.          | FILING DATE | PUB/PAT NO. | INVENTORS               | TITLE  | STATUS  |
| P1100 EP 001<br>748.611                                  | 14817900.5           | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 HK 001   | 16111718             | 10/11/2016  |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 IL 001   | 242436               | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 IN 001   | 10480/DELNP/2<br>015 | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 JP 001   | 2016-524268          | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 KR 001   | 2015-7033268         | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 MX 001   | MX/a/2015/0165<br>67 | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 NZ 001   | 713904               | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 PH 001   | 1-2015-502614        | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 SG 001   | 11201509313P         | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 TW 001   | 103122511            | 6/30/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 TH 001   | 1501006811           | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 UA 001   | a 2015 12417         | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |
| P1100 ZA 001   | 2015/08444           | 6/27/2014   |             | Chhabra; Kulman;<br>Liu | Thrombin Cleavable Linker With Xten And Its Uses Thereof | Pending |

| FACTOR VIII CHIMERIC PROTEINS AND USES THEREOF<br>ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC. |                 |             |             |              |  |         |
|---|-----------------|-------------|-------------|--------------|--|---------|
| BIOGEN REF. NO.   | S/N PUB NO.     | FILING DATE | PUB/PAT NO. | INVENTORS    | TITLE  | STATUS  |
| P1179 US 001<br>749.101   | 61/926,226      | 1/10/2014   |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Expired |
| P1179 US 002<br>749.102   | 61/988,104      | 5/2/2014    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Expired |
| P1179 US 003  | 15/110,673      | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 AE 001  | 865/2016        | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 AU 001  | 2015204646      | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 BR 001  | BR1120160155122 | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 CA 001  | 2,935,954       | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 CL 001  | 1749-2016       | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 CN 001  | 2.0158E+11      | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 CO 001  | NC2016/0000175  | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 EA 001  | 201691111       | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 EP 001  | 15735473.9      | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 IL 001  | 246476          | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 IN 001  | 2.01617E+11     | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 JP 001  | 2016-545930     | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 KR 001  | 2016-7021744    | 1/9/2015    |             | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |

| FACTOR VIII CHIMERIC PROTEINS AND USES THEREOF        |                       |             |                |              |  |         |
|---|-----------------------|-------------|----------------|--------------|--|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC. |                       |             |                |              |  |         |
| BIOGEN REF. NO.                                       | S/N PUB NO.           | FILING DATE | PUB/PAT NO.    | INVENTORS    | TITLE  | STATUS  |
| P1179 MX 001  | MX/a/2016/008958      | 1/9/2015    |                | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 MY 001  | P12016001276          | 1/9/2015    |                | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 NZ 001  | 721544                | 1/9/2015    |                | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 PH 001  | 1-2016-501323         | 1/9/2015    |                | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 SG 001  | 11201605242Y          | 1/9/2015    |                | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 TH 001  | 1601004034            | 1/9/2015    |                | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 UA 001  | a201607049            | 1/9/2015    |                | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 ZA 001  | 2016/04655            | 1/9/2015    |                | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Pending |
| P1179 WO 001<br>749.601                               | PCT/US2015/01073<br>8 | 1/9/2015    | WO/2015/106052 | Chhabra; Liu | Factor VIII Chimeric Proteins And Uses Thereof | Active  |

| CHIMERIC FVII-XTEN MOLECULES AND USES THEREOF         |             |             |             |           |   |         |
|---|-------------|-------------|-------------|-----------|---|---------|
| ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC. |             |             |             |           |   |         |
| BIOGEN REF. NO.                                       | S/N PUB NO. | FILING DATE | PUB/PAT NO. | INVENTORS | TITLE   | STATUS  |
| P1098 US 001<br>747.101                               | 61/829,878  | 05/31/2013  |             | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Expired |
| P1098 US 002<br>747.102                               | 61/883,707  | 09/27/2013  |             | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Expired |
| P1098 US 003  | 61/901,954  | 11/08/2011  |             | Salas     | Chimeric FVII-Xten                            | Expired |

| CHIMERIC FVII-XTEN MOLECULES AND USES THEREOF<br>ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC. |                  |             |                       |           |   |           |
|--|------------------|-------------|-----------------------|-----------|---|-----------|
| BIOGEN REF. NO.  | S/N PUB NO.      | FILING DATE | PUB/PAT NO.           | INVENTORS | TITLE   | STATUS    |
| 747.103  |                  | 3           |                       |           | Molecules And Uses Thereof                    |           |
| P1098 US 004<br>747.104  | 61/988,105       | 05/02/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Expired   |
| P1098 US 005<br>747.831  | 14/894,101       | 05/30/2014  | US 2016-0115467<br>A1 | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 AR 001   | P140102147       | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 AU 001   | 2014273881       | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 BR 001   | BR112015029387-5 | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 CA 001   | 2,912,654        | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 CL 001   | 3472-2015        | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 CN 001   | 201480028641.6   | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 CO 001   | 15-283.434       | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 EA 001   | 201592023        | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 EP 001   | 14804745.9       | 05/30/2014  | EP3004159 A2          | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 IL 001   | 242435           | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 IN 001   | 10504/DELNP/2015 | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 JP 001   | N/A              | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |
| P1098 KR 001   | 2015-7032744     | 05/30/2014  |                       | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |

| CHIMERIC FVII-XTEN MOLECULES AND USES THEREOF<br>ASSIGNED TO: AMUNIX OPERATING INC. AND BIOGEN MA INC. |                       |             |                |           |   |           |  |
|--|-----------------------|-------------|----------------|-----------|---|-----------|--|
| BIOGEN REF. NO.  | S/N PUB NO.           | FILING DATE | PUB/PAT NO.    | INVENTORS | TITLE   | STATUS    |  |
| P1098 MX 001   | MX/a/2015/016299      | 05/30/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 NZ 001   | 713903                | 05/30/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 WO 001<br>747.601  | PCT/US2014/04037<br>0 | 05/30/2014  | WO/2014/194282 | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 PH 001   | 1-2015-502572         | 05/30/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 SG 001   | 11201509260R          | 05/30/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 TH 001   | 1501006810            | 05/30/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 TW 001   | 103118805             | 05/29/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 UA 001   | a201512416            | 05/30/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 ZA 001   | 2015/08269            | 05/30/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |
| P1098 VE 001   | 2014-000677           | 05/30/2014  |                | Salas     | Chimeric FVII-Xten Molecules And Uses Thereof | Abandoned |  |

**PATENT FAMILIES CO-OWNED BY BIOGEN MA INC AND A THIRD PARTY**

| METHODS OF REDUCING IMMUNOGENICITY AGAINST FACTOR VIII IN INDIVIDUALS UNDERGOING FACTOR VIII THERAPY |                        |             |                  |  |  |          |
|--|------------------------|-------------|------------------|--|--|----------|
| ASSIGNED TO: BIOGEN MA INC. AND PUGET SOUND BLOOD CENTER   |                        |             |                  |  |  |          |
| BIOGEN REF. NO.  | S/N PUB NO.            | FILING DATE | PUB/PAT NO.      | INVENTORS  | TITLE  | STATUS   |
| P0971 US001  | 61/586,103             | 01/12/2012  |                  | Jiang; Liu                                       | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Inactive |
| P0971 US 002   | 61/668,961             | 07/06/2012  |                  | Jiang; Krishnamoorthy; Liu                       | Method Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy  | Inactive |
| P0971 US 003   | 14/<br>37<br>1,9<br>31 | 01/12/2013  | 2014-<br>0370035 | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Pending  |
| P0971 AU 001   | 201320423<br>7         | 01/12/2013  |                  | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Allowed  |
| P0971 AU 002   | 201621076<br>8         | 08/05/2016  |                  | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Pending  |
| P0971 BR 001   | BR112014<br>017111-4   | 01/12/2013  |                  | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Pending  |
| P0971 CA 001   | 2,863,329              | 01/12/2013  |                  | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Pending  |
| P0971 CN 001   | 201380013<br>831.6     | 01/12/2013  | 104254614        | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Pending  |
| P0971 EA 001   | 201491211              | 01/12/2013  |                  | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Pending  |

| METHODS OF REDUCING IMMUNOGENICITY AGAINST FACTOR VIII IN INDIVIDUALS UNDERGOING FACTOR VIII THERAPY |                       |             |                       |  |  |          |
|--|-----------------------|-------------|-----------------------|--|--|----------|
| ASSIGNED TO: BIOGEN MA INC. AND PUGET SOUND BLOOD CENTER   |                       |             |                       |  |  |          |
| BIOGEN REF. NO.  | S/N PUB NO.           | FILING DATE | PUB/PAT NO.           | INVENTORS  | TITLE  | STA TUS  |
| P0971 EP 001   | 13735995.<br>6        | 01/12/2013  | 2802668               | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Undergoing Factor VIII Therapy<br>Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy | Pending  |
| P0971 IL 001   | 233565                | 01/12/2013  |                       | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy                                   | Pending  |
| P0971 JP 001   | 2014-<br>552355       | 01/12/2013  | 2015-<br>504898       | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy                                   | Pending  |
| P0971 NZ<br>001  | 627078                | 01/12/2013  |                       | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy                                   | Granted  |
| P0971 OM<br>001  | OM/P/201<br>4/00146   | 01/12/2013  |                       | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy                                   | Pending  |
| P0971 QA<br>001  | QA/20140<br>7/00259   | 01/12/2013  |                       | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy                                   | Pending  |
| P0971 UA<br>001  | a20140825<br>9        | 01/12/2013  |                       | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy                                   | Pending  |
| P0971 WO<br>001  | PCT/US20<br>13/021332 | 01/12/2013  | WO<br>2013/10678<br>9 | Jiang; Josephson;<br>Krishnamoorthy; Liu; Pierce | Methods Of Reducing Immunogenicity Against Factor VIII In Individuals Undergoing Factor VIII Therapy                                   | Inactive |