

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT8280844

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	RELEASE OF PATENT SECURITY INTERESTS RECORDED AT REEL 060434, FRAME 0536

**CONVEYING PARTY DATA**

Name	Execution Date
DEUTSCHE BANK AG NEW YORK BRANCH, AS COLLATERAL AGENT	11/14/2023

**RECEIVING PARTY DATA**

<b>Name:</b>	MALLINCKRODT ENTERPRISES LLC
<b>Street Address:</b>	675 MCDONNELL BOULEVARD
<b>City:</b>	HAZELWOOD
<b>State/Country:</b>	MISSOURI
<b>Postal Code:</b>	63042
<b>Name:</b>	MALLINCKRODT LLC
<b>Street Address:</b>	385 MARSHALL AVENUE
<b>City:</b>	WEBSTER GROVES
<b>State/Country:</b>	MISSOURI
<b>Postal Code:</b>	63119
<b>Name:</b>	SPECGX LLC
<b>Street Address:</b>	385 MARSHALL AVENUE
<b>City:</b>	WEBSTER GROVES
<b>State/Country:</b>	MISSOURI
<b>Postal Code:</b>	63119
<b>Name:</b>	OCERA THERAPEUTICS, INC.
<b>Street Address:</b>	675 MCDONNELL BOULEVARD
<b>City:</b>	HAZELWOOD
<b>State/Country:</b>	MISSOURI
<b>Postal Code:</b>	63042
<b>Name:</b>	STRATATECH CORPORATION
<b>Street Address:</b>	510 CHARMANY DR. NO. 169
<b>City:</b>	MADISON
<b>State/Country:</b>	WISCONSIN
<b>Postal Code:</b>	53719
<b>Name:</b>	VTESSE LLC
<b>Street Address:</b>	675 MCDONNELL BOULEVARD

PATENT

<b>City:</b>	HAZELWOOD
<b>State/Country:</b>	MISSOURI
<b>Postal Code:</b>	63042
<b>Name:</b>	MALLINCKRODT PHARMA IP TRADING UNLIMITED COMPANY
<b>Street Address:</b>	COLLEGE BUSINESS & TECHNOLOGY PARK CRUISERATH, BLANCHARDSTOWN
<b>City:</b>	DUBLIN 15
<b>State/Country:</b>	IRELAND
<b>Name:</b>	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
<b>Street Address:</b>	COLLEGE BUSINESS & TECHNOLOGY PARK CRUISERATH, BLANCHARDSTOWN
<b>City:</b>	DUBLIN
<b>State/Country:</b>	IRELAND
<b>Name:</b>	SUCAMPO PHARMA AMERICAS LLC
<b>Street Address:</b>	675 MCDONNELL BOULEVARD
<b>City:</b>	HAZELWOOD
<b>State/Country:</b>	MISSOURI
<b>Postal Code:</b>	63042

**PROPERTY NUMBERS Total: 489**

<b>Property Type</b>	<b>Number</b>
<b>Patent Number:</b>	6579985
<b>Patent Number:</b>	7285665
<b>Patent Number:</b>	7456306
<b>Patent Number:</b>	7385068
<b>Patent Number:</b>	8748611
<b>Patent Number:</b>	8871779
<b>Patent Number:</b>	7511060
<b>Patent Number:</b>	7834184
<b>Patent Number:</b>	7622586
<b>Application Number:</b>	15710990
<b>Patent Number:</b>	9713592
<b>Patent Number:</b>	7114510
<b>Patent Number:</b>	9278111
<b>Patent Number:</b>	10537697
<b>Patent Number:</b>	8790715
<b>Patent Number:</b>	8846112
<b>Patent Number:</b>	8282966
<b>Patent Number:</b>	8293284
<b>Patent Number:</b>	8431163

Property Type	Number
Patent Number:	8795741
Patent Number:	9499556
Patent Number:	10227335
Application Number:	16378361
Patent Number:	10899749
Patent Number:	10089678
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Patent Number:	9127009
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Patent Number:	9181237
Patent Number:	9193737
Patent Number:	9993422
Patent Number:	9766152
Application Number:	13657711
Application Number:	15714137
Patent Number:	9012468
Patent Number:	10441508
Patent Number:	11077024
Patent Number:	9301918
Application Number:	14722541
Patent Number:	9339565
Patent Number:	9914695
Patent Number:	9399012
Patent Number:	9610265
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Patent Number:	10383834
Patent Number:	9556108
Patent Number:	9593111
Application Number:	16002199
Application Number:	14788908
Patent Number:	7945301
Patent Number:	8703089
Patent Number:	9567226
Patent Number:	10486126
Patent Number:	7238469
Patent Number:	8778413
Patent Number:	7574246

<b>Property Type</b>	<b>Number</b>
Patent Number:	10543325
Application Number:	16504881
Patent Number:	9616193
Patent Number:	10342948
Patent Number:	10328231
Application Number:	16365263
Patent Number:	11202873
Patent Number:	10576225
Patent Number:	10201674
Patent Number:	10894135
Patent Number:	10613103
Patent Number:	D730525
Patent Number:	D729937
Patent Number:	10512741
Application Number:	14325993
Application Number:	15854643
Application Number:	16677435
Patent Number:	9629358
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Patent Number:	10391120
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Patent Number:	10195380
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Patent Number:	10661045
Patent Number:	8573209
Patent Number:	8573210
Patent Number:	8291904

<b>Property Type</b>	<b>Number</b>
Patent Number:	9265911
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Patent Number:	9408993
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Patent Number:	10188822
Patent Number:	11065415
Patent Number:	10052426
Patent Number:	10773046
Application Number:	16537955
Patent Number:	10426913
Patent Number:	9770570
Patent Number:	10960169
Patent Number:	10905845
Patent Number:	9795756
Patent Number:	9032959
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Patent Number:	10918819
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Patent Number:	8517015
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Patent Number:	10335452
Patent Number:	10525226
Patent Number:	10384031
Patent Number:	10894140
Application Number:	16502828
Application Number:	16253834
Patent Number:	11260196
Patent Number:	10071213

Property Type	Number
Patent Number:	10835696
Patent Number:	10232138
Patent Number:	10226592
Patent Number:	11154684
Patent Number:	8757148
Application Number:	16411944
Patent Number:	9895199
Patent Number:	D701963
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Patent Number:	9108016
Patent Number:	9550040
Patent Number:	10556086
Application Number:	17570253
Application Number:	17559453
Application Number:	17547966
Application Number:	17516591
Application Number:	17515985
Application Number:	17525349
Application Number:	63282014
Application Number:	17587442
Application Number:	63304937
Application Number:	17666983
Application Number:	17674198
Application Number:	11917180
Patent Number:	9856251
Patent Number:	9458109
Patent Number:	8669366
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Patent Number:	9415044
Patent Number:	8623888
Patent Number:	8115002
Patent Number:	8445682
Patent Number:	8232400

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Patent Number:	8729266
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Patent Number:	8217175
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Patent Number:	10758703
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<b>Property Type</b>	<b>Number</b>
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Patent Number:	10434239
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Patent Number:	10641415
Patent Number:	10828415
Patent Number:	9089584
Patent Number:	9119897
Patent Number:	9205240
Patent Number:	8389576
Patent Number:	10273255
Application Number:	16219253
Application Number:	16505295
Patent Number:	8735574
Patent Number:	9181285
Patent Number:	9688705
Patent Number:	10533024
Application Number:	15603654
Patent Number:	10662209
Patent Number:	11297829
Patent Number:	10091983
Patent Number:	9295543
Application Number:	13691677
Application Number:	16150048
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Property Type	Number
Application Number:	16665353
Patent Number:	11033508
Patent Number:	10927068
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Patent Number:	11044904
Patent Number:	8796416
Patent Number:	9550822
Patent Number:	10286041
Patent Number:	6818763
Application Number:	16481405
Patent Number:	7375216
Patent Number:	7777028
Patent Number:	8178664
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Patent Number:	8835416
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Patent Number:	9517239
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Patent Number:	10543334
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Patent Number:	D807510

Property Type	Number
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Patent Number:	D683851
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<b>Property Type</b>	<b>Number</b>
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Application Number:	14336357
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Patent Number:	8624031
Patent Number:	7795312
Patent Number:	8337891

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Patent Number:	11020422
Application Number:	16574699
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<b>Property Type</b>	<b>Number</b>
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Application Number:	17605699
Application Number:	17458202
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Patent Number:	10561649
Patent Number:	7868045
Patent Number:	8530519
Patent Number:	9084815
Application Number:	16785983
Application Number:	16785978

<b>Property Type</b>	<b>Number</b>
Application Number:	16803719
Application Number:	62979649
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Application Number:	16818528
Application Number:	16828674
Application Number:	16828681
Patent Number:	11161802
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Application Number:	16856632
Patent Number:	11278696
Application Number:	63018894
Application Number:	63034602
Application Number:	63024258
Patent Number:	11078220
Application Number:	16875000
Application Number:	63028874
Application Number:	16990711
Application Number:	63049447
Application Number:	16906976
Application Number:	17175779
Application Number:	17176013
Application Number:	17420622
Application Number:	17319760
Application Number:	17215686
Application Number:	17185586
Application Number:	63194672
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Application Number:	63194682
Application Number:	63208309
Application Number:	17007603
Application Number:	63079315
Application Number:	63083532
Application Number:	17078821
Application Number:	17083409
Application Number:	17104864
Application Number:	17091109

Property Type	Number
Application Number:	17141945
Application Number:	17151410
Application Number:	17763552
Patent Number:	11324912
Patent Number:	8088733
Patent Number:	9371297
Application Number:	17767009
Patent Number:	9133235
Patent Number:	10039716
Patent Number:	9949949
Patent Number:	10004787
Patent Number:	10213385
Patent Number:	10258602
Patent Number:	10383823

**CORRESPONDENCE DATA**

**Fax Number:**

*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.*

**Phone:** 2136207848

**Email:** iprecordations@whitecase.com

**Correspondent Name:** JUSTINE LU/WHITE & CASE LLP

**Address Line 1:** 555 SOUTH FLOWER STREET, SUITE 2700

**Address Line 4:** LOS ANGELES, CALIFORNIA 90071

<b>ATTORNEY DOCKET NUMBER:</b>	1111779-3049-S216
<b>NAME OF SUBMITTER:</b>	JUSTINE LU
<b>SIGNATURE:</b>	/Justine Lu/
<b>DATE SIGNED:</b>	11/16/2023

**Total Attachments: 108**

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RELEASE OF PATENT SECURITY INTERESTS, dated as of November 14, 2023 (this “Release”), by Deutsche Bank AG New York Branch, as collateral agent under the Credit Agreement (as defined below) (in such capacity, the “Collateral Agent”) in favor of **MALLINCKRODT ENTERPRISES LLC, MALLINCKRODT LLC, SPECGX LLC, OCERA THERAPEUTICS, INC., STRATATECH CORPORATION, SUCAMPO PHARMA AMERICAS LLC, VTESSE LLC, MALLINCKRODT PHARMA IP TRADING UNLIMITED COMPANY** and **MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED** (each a “Pledgor”, collectively the “Pledgors”). Capitalized terms used herein and not otherwise defined shall have the meanings assigned to such terms in the U.S. Collateral Agreement, referred to below.

A. Reference is made to the U.S. Collateral Agreement, dated as of June 16, 2022 (as amended, restated, amended and restated, supplemented or otherwise modified from time to time, the “U.S. Collateral Agreement”), among MALLINCKRODT INTERNATIONAL FINANCE S.A., a public limited liability company (société anonyme) incorporated under the laws of the Grand Duchy of Luxembourg, having its registered office at 124, boulevard de la Pétrusse, L-2330 Luxembourg, and registered with the Luxembourg Trade and Companies Register (R.C.S Luxembourg) under number B 172.865 (the “Issuer”), MALLINCKRODT CB LLC, a Delaware limited liability company (the “US Co-Issuer”, and together with the Issuer, the “Issuers”), each Guarantor listed on the signature pages thereof and each other Guarantor that becomes a party thereto after the Issue Date (as defined therein) (together with the Issuer and the US Co-Issuer, collectively, the “Pledgors”), the Credit Agreement Agent (as defined therein), the New First Lien Trustee (as defined therein), the Existing First Lien Trustee (as defined therein) and DEUTSCHE BANK AG NEW YORK BRANCH, as collateral agent (together with its successors and assigns in such capacity, the “Collateral Agent”) for the Secured Parties (as defined therein) and (ii) the Notice of Grant of Security Interest in Patents, dated as of June 16, 2022, among the Pledgors party thereto and the Collateral Agent (such documents set forth in clauses (i) and (ii) the “Security Documents”).

B. Pursuant to the Security Documents, the Pledgors granted to the Collateral Agent, for the benefit of the Secured Parties, a security interest in all right, title and interest of the Pledgors in, to and under, among other things, the Patents of the Pledgors set forth on Schedule I hereto (collectively, the “Patent Collateral”), which security interest was recorded with the United States Patent and Trademark Office on June 22, 2022 at Reel/Frame 060434/0536.

Accordingly, for good and valuable consideration, the receipt and sufficiency of the which are hereby acknowledged, in accordance with the U.S. Collateral Agreement, the Collateral Agent does hereby release, relinquish and discharge any and all security interests it has against the Patent Collateral. If and to the extent that the Collateral Agent has acquired any right, title or interest in and to the Patent Collateral, the Collateral Agent, without representation or warranty of any kind, hereby re-transfers, re-conveys and re-assigns such right, title or interest to the applicable Pledgor. The Collateral Agent acknowledges and agrees that the Issuers or their designees shall, on behalf of the Collateral Agent (at the Issuers’ sole cost and expenses), make filings, including of this Release, with the United States Patent and Trademark Office and other necessary filings to

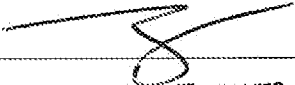
evidence the release and termination of the Collateral Agent's security interests in the Patent Collateral. The Collateral Agent agrees to take all further actions, and provide to each Pledgor and its successors, assigns or other legal representatives, all such cooperation and assistance (including, without limitation, the execution and delivery of any and all documents or other instruments), reasonably requested by the Pledgors, at the Pledgors' sole cost and expense, to more fully and effectively effectuate the purposes of this Release.

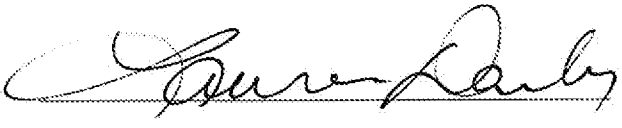
THIS RELEASE SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK AND SHALL BE BINDING UPON THE COLLATERAL AGENT'S REPRESENTATIVES, SUCCESSORS, ASSIGNS AND TRANSFEREES.

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IN WITNESS WHEREOF, the Collateral Agent has caused this Release to be duly executed as of the day and year first above written.

DEUTSCHE BANK AG NEW YORK BRANCH,  
as Collateral Agent

By:   
Name: Philip Tancorra  
Title: Director

By:   
Name: Lauren Danbury  
Title: Vice President

[SIGNATURE PAGE TO RELEASE OF PATENT SECURITY INTERESTS]

Schedule I  
Patents

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PREPARATION OF CODEINE FROM MORPHINE	10/274702	21-Oct-2002	6579985	17-Jun-2003	21-Oct-2022	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF QUATERNARY N-ALKYL MORPHINAN ALKALOID SALTS	10/530446	05-Apr-2005	7285665	23-Oct-2007	21-Apr-2024	Granted	SPECGX LLC
United States of America	Stearate Composition and Method of production thereof	10/558591	29-Nov-2005	7456306	25-Nov-2008	15-Jun-2025	Granted	SPECGX LLC
United States of America	Improved Stearate Composition and Method	11/154849	16-Jun-2005	7385068	10-Jun-2008	17-Mar-2025	Granted	SPECGX LLC
United States of America	PROCESSES FOR PREPARING MORPHINAN-6-ONE PRODUCTS WITH LOW LEVELS OF ALPHA, BETA-UNSATURATED KETONE COMPOUNDS	13/294546	11-Nov-2011	8748611	10-Jun-2014	01-Oct-2027	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PROCESSES FOR PREPARING MORPHINAN-6-ONE PRODUCTS WITH LOW LEVELS OF ALPHA, BETA-UNSATURATED KETONE COMPOUNDS	15/710990	21-Sep-2017				Published	SPECGX LLC
United States of America	PROCESSES FOR PREPARING MORPHINAN-6-ONE PRODUCTS WITH LOW LEVELS OF ALPHA, BETA-UNSATURATED KETONE COMPOUNDS	11/915606	27-Nov-2007	8871779	28-Oct-2014	22-Nov-2029	Granted	SPECGX LLC
United States of America	OPIATE INTERMEDIATES AND METHODS OF SYNTHESIS	11/741910	30-Apr-2007	7511060	31-Mar-2009	02-Jun-2026	Granted	SPECGX LLC
United States of America	OPIATE INTERMEDIATES AND METHODS OF SYNTHESIS	11/718263	30-Apr-2007	7834184	16-Nov-2010	01-Feb-2028	Granted	SPECGX LLC
United States of America	OPIATE INTERMEDIATES AND METHODS OF SYNTHESIS	11/741932	30-Apr-2007	7622586	24-Nov-2009	22-May-2026	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	MATRIX-BASED PULSE RELEASE PHARMACEUTICAL FORMULATION	11/909270	21-Sep-2007	9713592	25-Jul-2017	01-May-2031	Granted	SPECGX LLC
United States of America	VALVE WITH SMART HANDLE INCLUDING SENSORS AND MEMORY	10/416870	15-May-2003	7114510	03-Oct-2006	10-Jul-2022	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR GENERATING NITRIC OXIDE FOR MEDICAL USE	14/307664	18-Jun-2014	9278111	08-Mar-2016	16-Feb-2026	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR GENERATING NITRIC OXIDE FOR MEDICAL USE	15/008048	27-Jan-2016	10537697	21-Jan-2020	16-Feb-2026	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR GENERATING NITRIC OXIDE FOR MEDICAL USE	11/355670	16-Feb-2006	8790715	29-Jul-2014	16-Feb-2026	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS OF DISTRIBUTING A PHARMACEUTICAL PRODUCT COMPRISING NITRIC OXIDE GAS FOR INHALATION	13/683236	21-Nov-2012	8846112	30-Sep-2014	30-Jun-2029	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHODS OF REDUCING THE RISK OF OCCURRENCE OF PULMONARY EDEMA IN CHILDREN IN NEED OF TREATMENT WITH INHALED NITRIC OXIDE	12/821020	22-Jun-2010	8282966	09-Oct-2012	30-Jun-2029	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHODS OF REDUCING THE RISK OF OCCURRENCE OF PULMONARY EDEMA IN TERM OR NEAR-TERM NEONATES IN NEED OF TREATMENT WITH INHALED NITRIC OXIDE	12/821041	22-Jun-2010	8293284	23-Oct-2012	30-Jun-2029	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS OF REDUCING THE RISK OF OCCURRENCE OF PULMONARY EDEMA ASSOCIATED WITH INHALATION OF NITRIC OXIDE GAS	13/651660	15-Oct-2012	8431163	30-Apr-2013	30-Jun-2029	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS FOR TREATING PATIENTS WHO ARE CANDIDATES FOR INHALED NITRIC OXIDE TREATMENT	13/683417	21-Nov-2012	8795741	05-Aug-2014	30-Jun-2029	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS OF ADMINISTERING INHALED NITRIC OXIDE GAS	16/378361	08-Apr-2019				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CONVENIENT PREPARATION OF N-SUBSTITUTED MORPHINAN-6-OLS FROM MORPHINAN-6-ONES	14/529368	31-Oct-2014	9499556	22-Nov-2016	31-Oct-2034	Granted	SPECGX LLC
United States of America	PREPARATION OF SUFENTANIL CITRATE AND SUFENTANIL BASE	15/164483	25-May-2016	10227335	12-Mar-2019	25-May-2036	Granted	SPECGX LLC

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PREPARATION OF SUPFENTANIL CITRATE AND SUPFENTANIL BASE	16/254074	22-Jan-2019	10899749	26-Jan-2021	25-May-2036	Granted	SPECGX LLC
United States of America	SUSPICIOUS ORDER MONITORING PROGRAM	14/192971	28-Feb-2014	10089678	02-Oct-2018	03-Aug-2034	Granted	SPECGX LLC
United States of America	COMPOSITIONS AND METHODS FOR PREPARING TAMPER RESISTANT PLATFORMS FOR EXTENDED SOLID DOSAGE FORMS	16/600874	14-Oct-2019	11096887	24-Aug-2021	11-Jul-2033	Granted	SPECGX LLC
United States of America	PREPARATION OF NORMORPHINANS	14/546617	18-Nov-2014	9127009	08-Sep-2015	18-Nov-2034	Granted	SPECGX LLC
United States of America	EXTENDED RELEASE, ABUSE DETERRENT PHARMACEUTICAL COMPOSITIONS	13/939357	11-Jul-2013	9730885	15-Aug-2017	04-Aug-2034	Granted	SPECGX LLC
United States of America	EXTENDED RELEASE, ABSURE DETERRENT PHARMACEUTICAL COMPOSITIONS	15/420386	31-Jan-2017	10485753	26-Nov-2019	11-Jul-2033	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METERED DOSE DISPENSING OF TOPICAL ANALGESICS	13/657711	22-Oct-2012				Published	MALLINCKR ODT LLC & NUVO RESEARCH INC.
United States of America	SUBSTITUTED BERBINES AND THEIR SYNTHESIS	14/504906	02-Oct-2014	9181237	10-Nov-2015	02-Oct-2034	Granted	SPECGX LLC
United States of America	PRODUCTION OF 6-HYDROXY MORPHINANS WITHOUT THE ISOLATION OF INTERMEDIATES	14/533522	05-Nov-2014	9193737	24-Nov-2015	05-Nov-2034	Granted	SPECGX LLC
United States of America	IMMEDIATE RELEASE, ABUSE DETERRENT PHARMACEUTICAL COMPOSITIONS	13/865286	18-Apr-2013	9993422	12-Jun-2018	18-Apr-2033	Granted	SPECGX LLC
United States of America	IMMEDIATE RELEASE, ABUSE DETERRENT PHARMACEUTICAL COMPOSITIONS	15/714137	25-Sep-2017				Published	SPECGX LLC
United States of America	MEDICAMENT SACHET LEAK TESTING SYSTEM	14/630960	25-Feb-2015	9766152	19-Sep-2017	03-Jun-2035	Granted	MALLINCKR ODT LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	ONE POT PROCESS FOR PRODUCING 6-HYDROXYL NAL-OPATE	13/762431	08-Feb-2013	9012468	21-Apr-2015	08-Feb-2033	Granted	SPECGX LLC
United States of America	SYSTEMS AND METHODS FOR HIGH HUMIDITY CURING WITHIN TABLET COATING SYSTEM	15/568587	23-Oct-2017	10441508	15-Oct-2019	24-Apr-2035	Granted	SPECGX LLC
United States of America	SYSTEMS AND METHODS FOR HIGH HUMIDITY CURING WITHIN TABLET COATING SYSTEM	16/549151	23-Aug-2019	11077024	03-Aug-2021	24-Apr-2035	Granted	SPECGX LLC
United States of America	SPRAY DRIED COMPOSITIONS HAVING DIFFERENT DISSOLUTION PROFILES AND PROCESSES FOR THEIR PREPARATION	14/722541	27-May-2015				Published	SPECGX LLC
United States of America	ABUSE DETERRENT TABLETS FOR IMMEDIATE RELEASE WITH FUNCTIONAL SCORE	14/211307	14-Mar-2014	9301918	05-Apr-2016	14-Mar-2034	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	IMPROVED PROCESS FOR THE PREPARATION OF RADIOIODINATED 3-FLUOROPROPYL-NOR-BETA-CIT	14/496376	25-Sep-2014	9339565	17-May-2016	25-Sep-2034	Granted	SPECGX LLC
United States of America	TWO-STEP PROCESS FOR PREPARING 3-SUBSTITUTED PHENYLALKYLAMINES	15/202670	06-Jul-2016	9914695	13-Mar-2018	10-Jul-2035	Granted	SPECGX LLC
United States of America	REDUCED DOSE INTRAVENOUS ACETAMINOPHEN	12/270796	13-Nov-2008	9399012	26-Jul-2016	11-Sep-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	REDUCED DOSE INTRAVENOUS ACETAMINOPHEN	15/184056	16-Jun-2016	9610265	04-Apr-2017	13-Nov-2028	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	REDUCED DOSE INTRAVENOUS ACETAMINOPHEN	15/436285	17-Feb-2017	9987238	05-Jun-2018	13-Nov-2028	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	REDUCED DOSE INTRAVENOUS ACETAMINOPHEN	15/979154	14-May-2018	10383834	20-Aug-2019	13-Nov-2028	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	PROCESS FOR PREPARING SUBSTITUTED PHENYLALKANES	14/796069	10-Jul-2015	9556108	31-Jan-2017	10-Jul-2035	Granted	SPECGX LLC
United States of America	ABUSE DETERRENT IMMEDIATE RELEASE FORMULATIONS COMPRISING NON-CELLULOSE POLYSACCHARIDES	16/002199	07-Jun-2018				Published	SPECGX LLC
United States of America	OXIDATIVE DEAROMATIZATION OF BERBINES	14/736752	11-Jun-2015	9593111	14-Mar-2017	11-Jun-2035	Granted	SPECGX LLC
United States of America	ABUSE DETERRENT IMMEDIATE RELEASE FORMULATIONS COMPRISING NON-CELLULOSE POLYSACCHARIDES	14/788908	01-Jul-2015				Published	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS AND APPARATUS FOR THE ADMINISTRATION OF CO	12/502991	14-Jul-2009	7945301	17-May-2011	27-Jun-2023	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	PROCESS FOR THE MANUFACTURE OF HIGH PURITY CARBON MONOXIDE	13/038539	02-Mar-2011	8703089	22-Apr-2014	14-Oct-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR THE MANUFACTURE OF HIGH PURITY CARBON MONOXIDE	14/193323	28-Feb-2014	9567226	14-Feb-2017	27-Aug-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR THE MANUFACTURE OF HIGH PURITY CARBON MONOXIDE	15/430677	13-Feb-2017	10486126	26-Nov-2019	09-Apr-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CARBON MONOXIDE IMPROVES OUTCOMES IN TISSUE AND ORGAN TRANSPLANTS AND SUPPRESSES APOPTOSIS	10/177930	21-Jun-2002	7238469	03-Jul-2007	21-Jun-2022	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	DOSING REGIMENS AND METHODS OF TREATMENT USING CARBON MONOXIDE	13/106437	12-May-2011	8778413	15-Jul-2014	27-Oct-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS AND APPARATUS FOR THE ADMINISTRATION OF CO	10/520270	05-Aug-2005	7574246	11-Aug-2009	05-Aug-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	THERAPEUTIC GAS DELIVERY DEVICE WITH PULSED AND CONTINUOUS FLOW CONTROL	16/504881	08-Jul-2019				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	ENHANCED PERFORMANCE VERIFICATION FOR THERAPEUTIC GAS DELIVERY	14/709308	11-May-2015	10543325	28-Jan-2020	01-Apr-2038	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	DEVICE AND METHODS FOR MONITORING OXYGENATION DURING TREATMENT WITH DELIVERY OF NITRIC OXIDE	16/365263	26-Mar-2019				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	THERAPEUTIC GAS DELIVERY DEVICE WITH PULSED AND CONTINUOUS FLOW CONTROL	14/211919	14-Mar-2014	9616193	11-Apr-2017	03-Jun-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	THERAPEUTIC GAS DELIVERY DEVICE WITH PULSED AND CONTINUOUS FLOW CONTROL	14/218067	18-Mar-2014	10342948	09-Jul-2019	17-Mar-2036	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	THERAPEUTIC GAS DELIVERY DEVICE WITH PULSED AND CONTINUOUS FLOW CONTROL	15/483138	10-Apr-2017	10328231	25-Jun-2019	02-Jun-2034	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	ENHANCED PERFORMANCE VERIFICATION PORT FOR THERAPEUTIC GAS DELIVERY	16/704530	05-Dec-2019	11202873	21-Dec-2021	11-May-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR DELIVERY OF THERAPEUTIC GAS	14/709316	11-May-2015	10576225	03-Mar-2020	21-Jul-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHOD FOR INTELLIGENT GAS SOURCE MANAGEMENT	14/709298	11-May-2015	10201674	12-Feb-2019	25-May-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEMS AND METHODS FOR INTELLIGENT GAS SOURCE MANAGEMENT AND/OR SYSTEMS AND METHODS FOR DELIVERY OF THERAPEUTIC GAS AND/OR ENHANCED PERFORMANCE VERIFICATION FOR THERAPEUTIC GAS DELIVERY	16/217969	12-Dec-2018	10894135	19-Jan-2021	16-Jul-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHOD OF IDENTIFYING AND TREATING PREMATURE INFANTS AT RISK FOR BPD	15/320635	20-Dec-2016	10613103	07-Apr-2020	18-Jun-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHODS OF REDUCING THE RISK OF MORTALITY ASSOCIATED WITH A MEDICAL TREATMENT	14/325993	08-Jul-2014				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS OF REDUCING THE RISK OF MORTALITY ASSOCIATED WITH A MEDICAL TREATMENT	15/854643	29-Dec-2017				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	THERAPEUTIC GAS DELIVERY DEVICE	29/467025	13-Sep-2013	D730525	26-May-2015	26-May-2029	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	THERAPEUTIC GAS DELIVERY DEVICE	29/467028	13-Sep-2013	D729937	19-May-2015	19-May-2029	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CLINICAL DECISION SUPPORT SYSTEM AND METHODS	14/026807	13-Sep-2013	10512741	24-Dec-2019	03-May-2034	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CLINICAL DECISION SUPPORT SYSTEM AND METHODS	16/677435	07-Nov-2019				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	ADMINISTRATION AND MONITORING OF NITRIC OXIDE IN EX VIVO FLUIDS	14/095621	03-Dec-2013	9629358	25-Apr-2017	21-May-2034	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	ADMINISTRATION AND MONITORING OF NITRIC OXIDE IN EX VIVO FLUIDS	15/066672	10-Mar-2016	10667510	02-Jun-2020	03-Dec-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	ADMINISTRATION AND MONITORING OF NITRIC OXIDE IN EX VIVO FLUIDS	15/493578	21-Apr-2017	11291202	05-Apr-2022	03-Dec-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS OF USING INHALED NITRIC OXIDE GAS FOR TREATMENT OF ACUTE RESPIRATORY DISTRESS SYNDROME IN CHILDREN	14/593085	09-Jan-2015	9381212	05-Jul-2016	09-Jan-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS OF USING INHALED NITRIC OXIDE GAS FOR TREATMENT OF ACUTE RESPIRATORY DISTRESS SYNDROME IN CHILDREN	16/217981	12-Dec-2018	10391120	27-Aug-2019	09-Jan-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS OF USING INHALED NITRIC OXIDE GAS FOR TREATMENT OF ACUTE RESPIRATORY DISTRESS SYNDROME IN CHILDREN	15/170130	01-Jun-2016	10201564	12-Feb-2019	09-Jan-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROMECHANICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	14/626409	19-Feb-2015	9279794	08-Mar-2016	19-Feb-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROMECHANICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/010999	29-Jan-2016	11141549	12-Oct-2021	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROMECHANICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/256053	02-Sep-2016	10166352	01-Jan-2019	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROMECHANICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/277253	27-Sep-2016	9981097	29-May-2018	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROMECHANICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/281176	30-Sep-2016	9974910	22-May-2018	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROCHEMICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/284611	04-Oct-2016	10220170	05-Mar-2019	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROCHEMICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/341142	02-Nov-2016	9956364	01-May-2018	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED



Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROMECHANICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/341262	02-Nov-2016	10195380	05-Feb-2019	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROMECHANICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/341584	02-Nov-2016	9919118	20-Mar-2018	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR COMPENSATING LONG TERM SENSITIVITY DRIFT OF ELECTROMECHANICAL GAS SENSORS EXPOSED TO NITRIC OXIDE	15/343314	04-Nov-2016	10046125	14-Aug-2018	19-Feb-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	GAS DELIVERY DEVICE AND SYSTEM	15/001020	19-Jan-2016	10272225	30-Apr-2019	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	NITRIC OXIDE DELIVERY DEVICE	15/204176	07-Jul-2016	10661045	26-May-2020	25-Sep-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	GAS DELIVERY DEVICE AND SYSTEM	13/509873	11-Jun-2012	8573209	05-Nov-2013	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	NITRIC OXIDE DELIVERY DEVICE	13/677483	15-Nov-2012	8573210	05-Nov-2013	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	GAS DELIVERY DEVICE AND SYSTEM	13/493493	11-Jun-2012	8291904	23-Oct-2012	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	GAS DELIVERY DEVICE AND SYSTEM	14/065962	29-Oct-2013	9265911	23-Feb-2016	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	GAS DELIVERY DEVICE AND SYSTEM	14/065975	29-Oct-2013	8776795	15-Jul-2014	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	NITRIC OXIDE DELIVERY DEVICE	14/065951	29-Oct-2013	8776794	15-Jul-2014	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	NITRIC OXIDE DELIVERY DEVICE	14/328150	10-Jul-2014	9408993	09-Aug-2016	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	GAS DELIVERY DEVICE AND SYSTEM	14/629742	24-Feb-2015	9295802	29-Mar-2016	06-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	APPARATUS AND METHOD FOR MONITORING NITRIC OXIDE DELIVERY	16/537955	12-Aug-2019				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	GAS DELIVERY DEVICE AND SYSTEM FOR USE IN MAGNETIC RESONANCE IMAGING	14/657548	13-Mar-2015	10188822	29-Jan-2019	28-Apr-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	GAS DELIVERY DEVICE AND SYSTEM FOR USE IN MAGNETIC RESONANCE IMAGING	16/217998	12-Dec-2018	11065415	20-Jul-2021	25-Nov-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS OF ADMINISTERING NITRIC OXIDE TO ARTERIAL OR ARTERIALIZED BLOOD	14/402786	21-Nov-2014	10052426	21-Aug-2018	23-Jun-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	APPARATUS AND METHOD FOR MONITORING NITRIC OXIDE DELIVERY	15/683290	22-Aug-2017	10773046	15-Sep-2020	18-Aug-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	APPARATUS AND METHOD FOR MONITORING NITRIC OXIDE DELIVERY	13/800287	13-Mar-2013	10426913	01-Oct-2019	06-Dec-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	APPARATUS AND METHOD FOR MONITORING NITRIC OXIDE DELIVERY	13/671057	07-Nov-2012	9770570	26-Sep-2017	03-May-2036	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	System and Method of Administering a Pharmaceutical Gas to a Patient	16/156453	10-Oct-2018	10960169	30-Mar-2021	21-Sep-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	BREATHING APPARATUS DETECTION AND PURGING	15/412342	23-Jan-2017	10905845	02-Feb-2021	05-Apr-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CANNULA FOR MINIMIZING DILUTION OF DOSING DURING NITRIC OXIDE DELIVERY	14/096548	04-Dec-2013	9795756	24-Oct-2017	24-Feb-2036	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	CANNULA FOR MINIMIZING DILUTION OF DOSING DURING NITRIC OXIDE DELIVERY	14/096910	04-Dec-2013	9032959	19-May-2015	04-Dec-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CANNULA FOR MINIMIZING DILUTION OF DOSING DURING NITRIC OXIDE DELIVERY	14/706449	07-May-2015	10130783	20-Nov-2018	12-Nov-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CANNULA FOR MINIMIZING DILUTION OF DOSING DURING NITRIC OXIDE DELIVERY	15/790300	23-Oct-2017	10918819	16-Feb-2021	04-Dec-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	15/167048	27-May-2016	10548920	04-Feb-2020	21-Sep-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	11/231554	21-Sep-2005	7523752	28-Apr-2009	21-Sep-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	13/331807	20-Dec-2011	8893717	25-Nov-2014	17-Feb-2033	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	12/430220	27-Apr-2009	8091549	10-Jan-2012	19-Mar-2026	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	13/287663	02-Nov-2011	8517015	27-Aug-2013	21-Sep-2025	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	13/284433	28-Oct-2011	8397721	19-Mar-2013	21-Sep-2025	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	13/536272	28-Jun-2012	8408206	02-Apr-2013	21-Sep-2025	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	13/778596	27-Feb-2013	9351994	31-May-2016	10-Dec-2026	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	13/942049	15-Jul-2013	8720440	13-May-2014	21-Sep-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	13/942115	15-Jul-2013	8607792	17-Dec-2013	21-Sep-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	13/942136	15-Jul-2013	8616204	31-Dec-2013	21-Sep-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	14/551186	24-Nov-2014	10099029	16-Oct-2018	21-Sep-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHOD OF TREATING PATIENTS WITH HEPATORENAL SYNDROME TYPE 1	14/920392	22-Oct-2015	10335452	02-Jul-2019	05-Apr-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEM AND METHODS FOR INDICATING LIFETIME OF AN NO2-TO-NO REACTOR CARTRIDGE USED TO DELIVER NO FOR INHALATION THERAPY TO A PATIENT	14/712419	14-May-2015	10525226	07-Jan-2020	11-Aug-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR MANUFACTURING AND SAFETY OF AN NO2-TO-NO REACTOR CARTRIDGE USED TO DELIVER NO FOR INHALATION THERAPY TO A PATIENT	14/744298	19-Jun-2015	10384031	20-Aug-2019	13-Feb-2038	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEMS AND METHODS FOR MANUFACTURING AND SAFETY OF AN NO2-TO-NO REACTOR CARTRIDGE USED TO DELIVER NO FOR INHALATION THERAPY TO A PATIENT	16/502828	03-Jul-2019				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	DEVICE AND METHOD FOR DIFFUSING HIGH CONCENTRATION NO WITH INHALATION THERAPY GAS	15/281512	30-Sep-2016	10894140	19-Jan-2021	13-Jun-2039	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHOD FOR DELIVERY OF THERAPEUTIC GAS TO PATIENTS IN NEED THEREOF USING ENHANCED BREATHING CIRCUIT GAS (BCG) FLOW MEASUREMENT	16/253834	22-Jan-2019				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEMS AND METHOD FOR DELIVERY OF THERAPEUTIC GAS TO PATIENTS IN NEED THEREOF USING ENHANCED BREATHING CIRCUIT GAS (BCG) FLOW MEASUREMENT	16/253871	22-Jan-2019	11260196	01-Mar-2022	05-Dec-2036	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHOD FOR DELIVERY OF THERAPEUTIC GAS TO PATIENTS, IN NEED THEREOF, RECEIVING BREATHING GAS FROM A VENTILATOR THAT VARIES AT LEAST PRESSURE AND/OR FLOW USING ENHANCED THERAPEUTIC GAS (NO) FLOW MEASUREMENT	14/700594	30-Apr-2015	10071213	11-Sep-2018	05-Dec-2036	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEMS AND METHOD FOR DELIVERY OF THERAPEUTIC GAS TO PATIENTS, IN NEED THEREOF, RECEIVING BREATHING GAS FROM A VENTILATOR THAT VARIES AT LEAST PRESSURE AND/OR FLOW USING ENHANCED THERAPEUTIC GAS (NO) FLOW MEASUREMENT	16/058402	08-Aug-2018	10835696	17-Nov-2020	22-Oct-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR DELIVERY OF THERAPEUTIC GAS TO PATIENTS IN NEED THEREOF USING ENHANCED BREATHING CIRCUIT GAS (BCG) FLOW MEASUREMENT	14/674327	31-Mar-2015	10232138	19-Mar-2019	05-Dec-2036	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SYSTEMS AND METHODS FOR DELIVERY OF THERAPEUTIC GAS TO PATIENTS IN NEED THEREOF USING ENHANCED BREATHING CIRCUIT GAS (BCG) FLOW MEASUREMENT	14/672447	30-Mar-2015	10226592	12-Mar-2019	05-Dec-2036	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	DEVICES AND METHODS FOR ENGAGING INDEXED VALVE AND PRESSURE CANISTER ASSEMBLY WITH COLLAR AND FOR LINEAR ACTUATION BY PLUNGER ASSEMBLY INTO FLUID COMMUNICATION WITH DEVICE FOR REGULATING DRUG DELIVERY	15/899063	19-Feb-2018	11154684	26-Oct-2021	07-Oct-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	DEVICES AND METHODS FOR ENGAGING INDEXED VALVE AND PRESSURE CANISTER ASSEMBLY WITH COLLAR AND FOR LINEAR ACTUATION BY PLUNGER ASSEMBLY INTO FLUID COMMUNICATION WITH DEVICE FOR REGULATING DRUG DELIVERY	13/260505	26-Sep-2011	8757148	24-Jun-2014	23-Jan-2030	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHOD OF TREATING PATIENTS WITH HEPATORENAL SYNDROME TYPE 1	16/411944	14-May-2019				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	DEVICES AND METHODS FOR ENGAGING INDEXED VALVE AND PRESSURE CANISTER ASSEMBLY WITH COLLAR AND FOR LINEAR ACTUATION BY PLUNGER ASSEMBLY INTO FLUID COMMUNICATION WITH DEVICE FOR REGULATING DRUG DELIVERY	14/301692	11-Jun-2014	9895199	20-Feb-2018	23-Jan-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	THERAPEUTIC GAS DELIVERY DEVICE	29/455842	24-May-2013	D701963	01-Apr-2014	01-Apr-2028	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	THERAPEUTIC GAS DELIVERY DEVICE	29/464499	16-Aug-2013	D729936	19-May-2015	19-May-2029	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	CANNULA FOR MINIMIZING DILUTION OF DOSING DURING NITRIC OXIDE DELIVERY	15/412348	23-Jan-2017	10556082	11-Feb-2020	04-Dec-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CANNULA FOR MINIMIZING DILUTION OF DOSING DURING NITRIC OXIDE DELIVERY	14/096629	04-Dec-2013	8770199	08-Jul-2014	04-Dec-2033	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CANNULA FOR MINIMIZING DILUTION OF DOSING DURING NITRIC OXIDE DELIVERY	14/312003	23-Jun-2014	9550039	27-Jan-2017	12-Aug-2034	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	BREATHING APPARATUS DETECTION AND PURGING	13/440046	05-Apr-2012	8944051	03-Feb-2015	05-Apr-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	BREATHING APPARATUS DETECTION AND PURGING	14/394433	03-Apr-2013	9108016	18-Aug-2015	05-Apr-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	BREATHING APPARATUS DETECTION AND PURGING	14/827523	17-Aug-2015	9550040	24-Jan-2017	05-Apr-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS OF ADMINISTERING HIGH CONCENTRATIONS OF NITRIC OXIDE	13/827240	14-Mar-2013	10556086	11-Feb-2020	15-Mar-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	FORMULATIONS OF L-ORNITHINE PHENYLACETATE	17/570253	06-Jan-2022				Pending	OCERA THERAPEUTI CS, INC.
United States of America	FORMULATIONS OF L-ORNITHINE PHENYLACETATE	17/559453	22-Dec-2021				Pending	OCERA THERAPEUTI CS, INC.
United States of America	METHODS TO PRODUCE HIGHLY IMMATURE MONOCYTE DERIVED DENDRITIC CELLS	17/547966	10-Dec-2021				Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	17/516591	01-Nov-2021				Pending	OCERA THERAPEUTI CS, INC.

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHOD FOR EX-VIVO EXPANSION OF REGULATORY T CELLS WITH ENHANCED SUPPRESSIVE FUNCTION FOR CLINICAL APPLICATION IN IMMUNE MEDIATED DISEASES	17/515985	01-Nov-2021				Published	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
United States of America	ENHANCED PERFORMANCE VERIFICATION PORT FOR THERAPEUTIC GAS DELIVERY	17/525349	12-Nov-2021				Pending	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
United States of America	INJECTABLE SUSTAINED RELEASE PHARMACEUTICAL COMPOSITION	63/282014	22-Nov-2021			22-Nov-2022	Pending	SPECGX LLC
United States of America	Method of Treating Patients With Hepatorenal Syndrome Type 1	17/587442	28-Jan-2022				Pending	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS OF EXTRACORPOREAL PHOTOPHORESIS FOR IMMUNE-RELATED ADVERSE EVENTS	63/304937	31-Jan-2022			31-Jan-2023	Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	APPARATUS AND METHOD FOR FILTERING LIQUID PARTICLES FROM INSPIRATORY GAS FLOW OF A PATIENT BREATHING CIRCUIT AFFILIATED WITH A VENTILATOR AND/OR NITRIC OXIDE DELIVERY SYSTEM	17/666983	08-Feb-2022				Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	INTELLIGENT GAS SOURCE MANAGEMENT	17/674198	17-Feb-2022				Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	A NEW SYNTHETIC ROUTE TO 14-HYDROXYL OPIATES THROUGH 1-HALO-THEBAINE OR ANALOGS	11/917180	11-Dec-2007	8067597	29-Nov-2011	03-Mar-2029	Granted	SPECGX LLC

PATENT

REEL: 065601 FRAME: 0405

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SUBSTITUTED BERBINES AND PROCESSES FOR THEIR SYNTHESIS	15/235312	12-Aug-2016	9856251	02-Jan-2018	02-Sep-2029	Granted	SPECGX LLC
United States of America	SUBSTITUTED BERBINES AND PROCESSES FOR THEIR SYNTHESIS	12/552457	02-Sep-2009	9458109	04-Oct-2016	21-Feb-2032	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF QUATERNARY N-ALKYL MORPHINAN ALKALOID SALTS	12/529723	22-Nov-2010	8669366	11-Mar-2014	10-Oct-2028	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF QUATERNARY N-ALKYL MORPHINAN ALKALOID SALTS	12/553144	03-Sep-2009	9040726	26-May-2015	07-Jan-2030	Granted	SPECGX LLC
United States of America	PROCESSES AND COMPOUNDS FOR THE PREPARATION OF NORMORPHINANS	12/469951	21-May-2009	8148528	03-Apr-2012	20-Apr-2030	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF QUATERNARY N-ALKYL MORPHINAN ALKALOID SALTS	14/569309	12-Dec-2014	9415044	16-Aug-2016	06-Mar-2028	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	3-OXY-HYDROMORPHONE DERIVATIVES	12/833025	09-Jul-2010	8623888	07-Jan-2014	29-Oct-2031	Granted	SPECGX LLC
United States of America	PREPARATION OF SUBSTITUTED MORPHINAN-6-ONES AND SALTS AND INTERMEDIATES THEREOF	12/441397	16-Mar-2009	8115002	14-Feb-2012	14-Nov-2028	Granted	SPECGX LLC
United States of America	PREPARATION OF 3,4-DIHYDROISOQUOLINES FROM AN ACID AND AN AMINE	12/518434	10-Jun-2009	8445682	21-May-2013	10-Sep-2029	Granted	SPECGX LLC
United States of America	PREPARATION OF 3,4-DIHYDROISOQUOLINES IN THE SYNTHESIS OF MORPHINANS	12/482014	10-Jun-2009	8232400	31-Jul-2012	26-Aug-2030	Granted	SPECGX LLC
United States of America	PREPARATION OF AMIDES FROM AN ACID FOR INTERMEDIATES IN THE SYNTHESIS OF MORPHINANS	12/481993	10-Jun-2009	8461384	11-Jun-2013	13-Nov-2030	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	THE USE OF ORIPAVINE AS A STARTING MATERIAL FOR BUPRENORPHINE	12/159025	24-Jun-2008	8993764	31-Mar-2015	22-Feb-2030	Granted	SPECGX LLC
United States of America	A PROCESS FOR THE PREPARATION OF HEXAHYDROISOQUINOLINES FROM 1,2,3,4-TETRAHYDROISOQUINOLINES	12/482036	10-Jun-2009	8227611	24-Jul-2012	04-Apr-2029	Granted	SPECGX LLC
United States of America	PREPARATION OF TETRAHYDROISOQUINOLINES FROM DIHYDROISOQUINOLINES	12/518430	10-Jun-2009	8242277	14-Aug-2012	22-Feb-2029	Granted	SPECGX LLC
United States of America	SOLID SUPPORT FOR FMOC-SOLID PHASE SYNTHESIS OF PEPTIDES	12/264948	05-Nov-2008	7714063	11-May-2010	05-Nov-2028	Granted	SPECGX LLC
United States of America	CRYSTALLINE FORMS OF NALTREXONE METHOBROMIDE	12/668218	08-Jan-2010	8383649	26-Feb-2013	11-Oct-2029	Granted	SPECGX LLC
United States of America	PROCESSES FOR SYNTHESIS OF OPIATE ALKALOID DERIVATIVES	12/586874	29-Sep-2009	8273887	25-Sep-2012	24-Dec-2030	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PREPARATION OF N-ALKYLATED OPIATES BY REDUCTIVE AMINATION	12/668900	13-Jan-2010	8729266	20-May-2014	13-Aug-2029	Granted	SPECGX LLC
United States of America	COMPOSITION AND METHOD FOR THE RELEASE OF PROTECTED PEPTIDES FROM A RESIN	12/298917	29-Oct-2008	8022181	20-Sep-2011	19-Jun-2028	Granted	SPECGX LLC
United States of America	PREPARATION OF OXYMORPHONE FROM ORIPAVINE	12/532410	22-Sep-2009	8217175	10-Jul-2012	29-May-2029	Granted	SPECGX LLC
United States of America	CRYSTALLINE FORMS OF NALTREXONE HYDROCHLORIDE	12/595543	12-Oct-2009	8399475	19-Mar-2013	27-Nov-2029	Granted	SPECGX LLC
United States of America	N-DEMETHYLATION OF N-METHYL MORPHINANS	12/316821	17-Dec-2008	7671204	02-Mar-2010	17-Dec-2028	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF 3-HYDROXYMORPHINAN DERIVATIVES	12/372788	18-Feb-2009	7999105	16-Aug-2011	19-Apr-2030	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF galpha-HYDROXY-N-ALKYLATED OPIATES	12/444421	06-Apr-2009	7985858	26-Jul-2011	09-May-2029	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PROCESS FOR THE PREPARATION OF galpha-HYDROXY-N-ALKYLATED OPIATES	12/630171	03-Dec-2009	8273888	25-Sep-2012	26-Apr-2030	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF galpha-HYDROXY-N-ALKYLATED OPIATES	12/630192	03-Dec-2009	8524904	03-Sep-2013	04-Dec-2029	Granted	SPECGX LLC
United States of America	NOVEL OPIATE REDUCTION UTILIZING CATALYTIC HYDROGEN TRANSFER REACTION	12/595519	12-Oct-2009	8309727	13-Nov-2012	29-Jul-2029	Granted	SPECGX LLC
United States of America	RECYCLING PROCESS FOR INCREASING THE YIELD OF OPIATE ALKALOID DERIVATIVES	12/586856	29-Sep-2009	8232398	31-Jul-2012	01-Jan-2031	Granted	SPECGX LLC
United States of America	EXTENDED RELEASE, ABUSE DETERRENT SOLID DOSAGE FORMS	15/464865	21-Mar-2017	10624888	21-Apr-2020	21-Mar-2037	Granted	SPECGX LLC



Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	GLUCOMANNAN CONTAINING PHARMACEUTICAL COMPOSITIONS WITH EXTENDED RELEASE AND ABUSE DETERRENT PROPERTIES	15/417541	27-Jan-2017	11065246	20-Jul-2021	27-Jan-2037	Granted	SPECGX LLC
United States of America	SYSTEMS AND METHODS FOR PROVIDING A PULSE OF A THERAPEUTIC GAS WITH A DESIRED FLOW PROFILE TO MAXIMIZE THERAPEUTIC EFFECTIVENESS	14/886556	19-Oct-2015	10758703	01-Sep-2020	01-Jun-2039	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR THE CONTINUOUS SEPARATION OF BIOLOGICAL FLUIDS INTO COMPONENTS	10/375629	27-Feb-2003	7186230	06-Mar-2007	01-Sep-2024	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR THE CONTINUOUS SEPARATION OF BIOLOGICAL FLUIDS INTO COMPONENTS	10/654742	03-Sep-2003	7211037	01-May-2007	01-Mar-2024	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHOD AND APPARATUS FOR THE CONTINUOUS SEPARATION OF BIOLOGICAL FLUIDS INTO COMPONENTS	10/654803	03-Sep-2003	7479123	20-Jan-2009	27-Nov-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR THE CONTINUOUS SEPARATION OF BIOLOGICAL FLUIDS INTO COMPONENTS	11/613021	01-Dec-2006	7850634	14-Dec-2010	13-Jan-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR THE CONTINUOUS SEPARATION OF BIOLOGICAL FLUIDS INTO COMPONENTS	12/795308	07-Jun-2010	9238097	19-Jan-2016	03-Jul-2024	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR THE CONTINUOUS SEPARATION OF BIOLOGICAL FLUIDS INTO COMPONENTS	11/406988	19-Apr-2006	7914477	29-Mar-2011	16-Feb-2026	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD AND APPARATUS FOR THE CONTINUOUS SEPARATION OF BIOLOGICAL FLUIDS INTO COMPONENTS	11/407271	19-Apr-2006	7503889	17-Mar-2009	11-Jun-2024	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHOD FOR COLLECTING A DESIRED BLOOD COMPONENT AND PERFORMING A PHOTOPHERESIS TREATMENT	15/491835	19-Apr-2017	10556055	11-Feb-2020	27-Feb-2023	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD FOR EX-VIVO EXPANSION OF REGULATORY T CELLS WITH ENHANCED SUPPRESSIVE FUNCTION FOR CLINICAL APPLICATION IN IMMUNE MEDIATED DISEASES	15/981332	16-May-2018	11186823	30-Nov-2021	17-May-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	PROCESSING BLOOD	15/974881	09-May-2018	10296020	23-Feb-2021	01-Jun-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	PROCESSING BLOOD	16/171089	25-Oct-2018	10940259	09-Mar-2021	01-Jun-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PROCESSING BLOOD	16/171096	25-Oct-2018	10953149	23-Mar-2021	01-Jun-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	USE OF APOPTOTIC CELLS EX VIVO TO GENERATE REGULATORY T CELLS	16/165679	19-Oct-2018	11124767	21-Sep-2021	02-Nov-2026	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	USE OF APOPTOTIC CELLS EX VIVO TO GENERATE REGULATORY T CELLS	11/579319	14-Jul-2008	9169461	27-Oct-2015	02-Nov-2026	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	USE OF APOPTOTIC CELLS EX VIVO TO GENERATE REGULATORY T CELLS	14/863274	23-Sep-2015	10138464	27-Nov-2018	27-May-2027	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CASSETTE FOR CONTROLLING MOVEMENT OF BLOOD AND SEPARATED BLOOD COMPONENTS	11/444721	01-Jun-2006	7465285	16-Dec-2008	01-Jun-2026	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHOD AND APPARATUS FOR COLLECTING A BLOOD COMPONENT AND PERFORMING A PHOTOPHERESIS TREATMENT	11/304092	15-Dec-2005	7476209	13-Jan-2009	15-Dec-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	PHOTOTHERAPY COMPOSITIONS AND METHODS	11/311714	19-Dec-2005	8057785	15-Nov-2011	22-Nov-2027	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	PHOTOTHERAPY COMPOSITIONS AND METHODS	13/243103	23-Sep-2011	8481008	09-Jul-2013	19-Dec-2025	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CENTRIFUGE SYSTEM AND METHOD FOR COMPONENT TRACKING	15/261968	11-Sep-2016	10434239	08-Oct-2019	09-Apr-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	CENTRIFUGE SYSTEM AND METHOD FOR COMPONENT TRACKING	16/537103	09-Aug-2019	11020522	01-Jun-2021	06-Jan-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SUPPORT FOR CENTRIFUGE TUBING	15/570996	31-Oct-2017	10641415	05-May-2020	05-May-2036	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	DEVICES, METHODS AND SYSTEMS FOR PRIMING, SEPARATING, AND COLLECTING BLOOD COMPONENTS	15/737163	15-Dec-2017	10828415	10-Nov-2020	16-Oct-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	TREATMENT OF TISSUE ADHESION	13/321954	22-Nov-2011	9089584	28-Jul-2015	28-May-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	DRY POWDER FIBRIN SEALANT	13/322754	28-Nov-2011	91119897	01-Sep-2015	28-May-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	POWDER DELIVERY DEVICE	13/139781	15-Dec-2009	9205240	08-Dec-2015	15-Dec-2029	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	ONE STEP MILLING PROCESS FOR PREPARING MICRONIZED PALIPERIDONE ESTERS	16/219253	13-Dec-2018				Published	SPECGX LLC
United States of America	METHODS FOR TREATING HYPERBILIRUBINEMIA WITH STANNOSOPORFIN	16/505295	08-Jul-2019				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	COMPOSITIONS COMPRISING ORNITHINE AND PHENYLACETATE OR PHENYLBUTYRATE FOR TREATING HEPATIC ENCEPHALOPATHY	11/720268	03-Oct-2007	8389576	05-Mar-2013	08-Dec-2025	Granted	OCERA THERAPEUTICS, INC.
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOSOPORFIN	15/867900	11-Jan-2018	10273255	30-Apr-2019	04-Oct-2027	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS FOR SYNTHESIZING METAL MESOPORPHYRINS	13/435868	30-Mar-2012	8735574	27-May-2014	30-Mar-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS FOR SYNTHESIZING METAL MESOPORPHYRINS	14/253710	15-Apr-2014	9181285	10-Nov-2015	30-Mar-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS FOR SYNTHESIZING METAL MESOPORPHYRINS	14/875141	05-Oct-2015	9688705	27-Jun-2017	30-Mar-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS FOR SYNTHESIZING METAL MESOPORPHYRINS	15/603654	24-May-2017				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS FOR SYNTHESIZING METAL MESOPORPHYRINS	16/125190	07-Sep-2018	10533024	14-Jan-2020	30-Mar-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED



Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS FOR TREATING HYPERBILIRUBINEMIA WITH STANNOSPORFIN	13/691677	30-Nov-2012				Published	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOSPORFIN	16/298603	11-Mar-2019	10662209	26-May-2020	04-Oct-2027	Granted	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
United States of America	CRYOPRESERVATION OF VIABLE HUMAN SKIN SUBSTITUTES	16/122598	05-Sep-2018	11297829	12-Apr-2022	13-Mar-2034	Granted	STRATATEC HOLDING CORPORATION
United States of America	HUMAN SKIN SUBSTITUTES EXPRESSING IL-12	16/150048	02-Oct-2018				Published	STRATATEC HOLDING CORPORATION
United States of America	CRYOPRESERVATION OF VIABLE HUMAN SKIN SUBSTITUTES	14/208439	13-Mar-2014	10091983	09-Oct-2018	13-Mar-2034	Granted	STRATATEC HOLDING CORPORATION
United States of America	SKIN SUBSTITUTES WITH IMPROVED PURITY	11/375950	15-Mar-2006	9295543	29-Mar-2016	15-Mar-2026	Granted	STRATATEC HOLDING CORPORATION

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	COLD STORAGE OF ORGANOTYPICALLY CULTURED SKIN EQUIVALENTS FOR CLINICAL APPLICATIONS	15/375755	12-Dec-2016	10743533	18-Aug-2020	14-Nov-2028	Granted	STRATATEC H CORPORATION
United States of America	DRIED AND IRRADIATED SKIN EQUIVALENTS FOR READY USE	15/377323	13-Dec-2016	9867904	16-Jan-2018	04-Nov-2029	Granted	STRATATEC H CORPORATION
United States of America	DRIED AND IRRADIATED SKIN EQUIVALENTS FOR READY USE	12/612284	04-Nov-2009	8580314	12-Nov-2013	04-Nov-2029	Granted	STRATATEC H CORPORATION
United States of America	DRIED AND IRRADIATED SKIN EQUIVALENTS FOR READY USE	14/054445	15-Oct-2013	8685463	01-Apr-2014	04-Nov-2029	Granted	STRATATEC H CORPORATION
United States of America	DRIED AND IRRADIATED SKIN EQUIVALENTS FOR READY USE	14/220320	20-Mar-2014	8992997	31-Mar-2015	04-Nov-2029	Granted	STRATATEC H CORPORATION
United States of America	DRIED AND IRRADIATED SKIN EQUIVALENTS FOR READY USE	14/669095	25-Mar-2015	9526811	27-Dec-2016	04-Nov-2029	Granted	STRATATEC H CORPORATION

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	HUMAN SKIN EQUIVALENTS EXPRESSING EXOGENOUS POLYPEPTIDES	10/909119	30-Jul-2004	7674291	09-Mar-2010	30-Jul-2024	Granted	STRATATEC H CORPORATION
United States of America	HUMAN SKIN EQUIVALENTS EXPRESSING EXOGENOUS POLYPEPTIDES	12/690160	20-Jan-2010	8092531	10-Jan-2012	30-Jul-2024	Granted	STRATATEC H CORPORATION
United States of America	HUMAN SKIN EQUIVALENTS EXPRESSING EXOGENOUS POLYPEPTIDES	14/335534	18-Jul-2014	9526748	27-Dec-2016	01-Sep-2024	Granted	STRATATEC H CORPORATION
United States of America	METHODS AND COMPOSITIONS FOR SELECTING CELLS WITH INCREASED POTENCY	11/297916	09-Dec-2005	9216202	22-Dec-2015	30-Jul-2024	Granted	STRATATEC H CORPORATION
United States of America	HUMAN SKIN EQUIVALENTS ENGINEERED TO EXPRESS EXOGENOUS ANTIMICROBIAL POLYPEPTIDES	13/343314	04-Jan-2012	8790636	29-Jul-2014	30-Jul-2024	Granted	STRATATEC H CORPORATION

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	HUMAN SKIN EQUIVALENTS ENGINEERED TO EXPRESS EXOGENOUS ANTIMICROBIAL POLYPEPTIDES	16/036619	16-Jul-2018	10918768	16-Feb-2021	30-Jul-2024	Granted	STRATATEC H CORPORATI ON
United States of America	HUMAN SKIN EQUIVALENTS EXPRESSING EXOGENOUS POLYPEPTIDES	11/365357	01-Mar-2006	9163076	20-Oct-2015	01-Mar-2026	Granted	STRATATEC H CORPORATI ON
United States of America	ACTH FOR TREATMENT OF ACUTE RESPIRATORY DISTRESS SYNDROME	14/214449	14-Mar-2014	10232018	19-Mar-2019	08-Jun-2034	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	APPARATUS AND METHOD FOR HUMIDITY CONDITIONING SAMPLE GAS OF A PATIENT BREATHING CIRCUIT AFFILIATED WITH A VENTILATOR AND/OR NITRIC OXIDE DELIVERY SYSTEM	16/665353	28-Oct-2019				Publishe d	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	DELAYED SUSTAINED RELEASE PHARMACEUTICAL PREPARATION	16/002285	07-Jun-2018	11033508	15-Jun-2021	07-Jun-2038	Granted	SPECGX LLC
United States of America	PROCESS FOR PREPARING ACYLATED AMPHETAMINE DERIVATIVES	16/201645	27-Nov-2018	10927068	23-Feb-2021	27-Nov-2038	Granted	SPECGX LLC
United States of America	APPARATUS AND METHOD FOR HUMIDITY CONDITIONING SAMPLE GAS OF A PATIENT BREATHING CIRCUIT AFFILIATED WITH A VENTILATOR AND/OR NITRIC OXIDE DELIVERY SYSTEM	15/459060	15-Mar-2017	10485945	26-Nov-2019	02-Mar-2038	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHODS TO IMPROVE ORGAN VIABILITY	16/112297	24-Aug-2018	11044904	29-Jun-2021	09-Feb-2039	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	ACTH PROPHYLACTIC TREATMENT OF RENAL DISORDERS	13/281175	25-Oct-2011	8796416	05-Aug-2014	25-Oct-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	ACTH PROPHYLACTIC TREATMENT OF RENAL DISORDERS	14/313903	24-Jun-2014	9550822	24-Jan-2017	25-Oct-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	ACTH PROPHYLACTIC TREATMENT OF RENAL DISORDERS	15/383969	19-Dec-2016	10286041	14-May-2019	25-Oct-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	TISSUE CONTAINER SYSTEMS	16/481405	26-Jul-2019				Published	STRATATEC H CORPORATION
United States of America	PREPARATION OF METAL MESOPORPHYRIN HALIDE COMPOUNDS	10/453815	03-Jun-2003	6818763	16-Nov-2004	03-Jun-2023	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PREPARATION OF METAL MESOPORPHYRIN HALIDE COMPOUNDS	10/812156	29-Mar-2004	7375216	20-May-2008	03-Jun-2023	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	PREPARATION OF METAL MESOPORPHYRIN HALIDE COMPOUNDS	11/957317	14-Dec-2007	7777028	17-Aug-2010	03-Jun-2023	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	PREPARATION OF METAL MESOPORPHYRIN HALIDE COMPOUNDS	12/833873	09-Jul-2010	8178664	15-May-2012	03-Jun-2023	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOSOPORFIN	11/867559	04-Oct-2007	7960371	14-Jun-2011	06-Apr-2029	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOSOPORFIN	12/968651	15-Dec-2010	8530458	10-Sep-2013	04-Oct-2027	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOSOPORFIN	14/019513	05-Sep-2013	8835416	16-Sep-2014	04-Oct-2027	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOSOPORFIN	14/460080	14-Aug-2014	9107927	18-Aug-2015	04-Oct-2027	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOSOPORFIN	14/793921	08-Jul-2015	9517239	13-Dec-2016	04-Oct-2027	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOSOPORFIN	15/343967	04-Nov-2016	9902745	27-Feb-2018	04-Oct-2027	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	KERATINOCYTES EXPRESSING EXOGENOUS ANGIOGENIC GROWTH FACTORS	10/425784	29-Apr-2003	7498167	03-Mar-2009	29-Apr-2023	Granted	STRATATEC H CORPORATION

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	KERATINOCYTES EXPRESSING EXOGENOUS ANGIOGENIC GROWTH FACTORS	12/392221	25-Feb-2009	7915042	29-Mar-2011	29-Apr-2023	Granted	STRATATEC H CORPORATION
United States of America	ORGANOTYPICALLY CULTURED SKIN TISSUE COMPRISING NIKS CELLS THAT EXPRESS EXOGENOUS HIF-1A	10/848646	19-May-2004	7807148	05-Oct-2010	29-Apr-2023	Granted	STRATATEC H CORPORATION
United States of America	METHOD OF TREATMENT USING ORGANOTYPICALLY CULTURED SKIN TISSUE COMPRISING NIKS CELLS THAT EXPRESS EXOGENOUS HIF-1A	12/886976	21-Sep-2010	7988959	02-Aug-2011	29-Apr-2023	Granted	STRATATEC H CORPORATION
United States of America	METHOD OF TREATMENT USING ORGANOTYPICALLY CULTURED SKIN TISSUE COMPRISING NIKS CELLS THAT EXPRESS EXOGENOUS HIF-1A	13/195614	01-Aug-2011	8808685	19-Aug-2014	29-Apr-2023	Granted	STRATATEC H CORPORATION
United States of America	SPECIES SPECIFIC DNA DETECTION	10/633141	01-Aug-2003	7462448	09-Dec-2008	01-Aug-2023	Granted	STRATATEC H CORPORATION

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	KIT FOR SPECIES SPECIFIC DNA DETECTION	12/329151	05-Dec-2008	7888496	15-Feb-2011	01-Aug-2023	Granted	STRATATEC H CORPORATI ON
United States of America	SKIN SUBSTITUTES WITH IMPROVED BARRIER FUNCTION	11/235814	27-Sep-2005	7407805	05-Aug-2008	01-Mar-2022	Granted	STRATATEC H CORPORATI ON
United States of America	SKIN SUBSTITUTES WITH IMPROVED BARRIER FUNCTION	12/174319	16-Jul-2008	7955790	07-Jun-2011	01-Mar-2022	Granted	STRATATEC H CORPORATI ON
United States of America	SKIN SUBSTITUTES AND USES THEREOF	10/087641	01-Mar-2002	6846675	25-Jan-2005	01-Mar-2022	Granted	STRATATEC H CORPORATI ON
United States of America	SKIN SUBSTITUTES AND USES THEREOF	11/006014	07-Dec-2004	7541188	02-Jun-2009	01-Mar-2022	Granted	STRATATEC H CORPORATI ON
United States of America	SKIN SUBSTITUTES FOR IRRITANCY TESTING	10/087388	01-Mar-2002	7501238	10-Mar-2009	01-Mar-2022	Granted	STRATATEC H CORPORATI ON
United States of America	RECOMBINANT FIBRINOGEN	15/331942	24-Oct-2016	10562956	18-Feb-2020	04-Jan-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SKIN SUBSTITUTES WITH IMPROVED BARRIER FUNCTION	10/087346	01-Mar-2002	6974697	13-Dec-2005	01-Mar-2022	Granted	STRATATEC H CORPORATI ON
United States of America	BIODEGRADABLE EXTRA VASCULAR STENT	15/400628	06-Jan-2017	10456505	29-Oct-2019	05-Feb-2030	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	APPARATUS AND METHOD FOR FILTERING LIQUID PARTICLES FROM INSPIRATORY GAS FLOW OF A PATIENT BREATHING CIRCUIT AFFILIATED WITH A VENTILATOR AND/OR NITRIC OXIDE DELIVERY SYSTEM	15/446110	01-Mar-2017	10744292	18-Aug-2020	23-Apr-2038	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	APPARATUS AND METHOD FOR DETECTING LIQUID LEVEL IN A CLEAR OR PARTIALLY CLEAR CONTAINER	15/460334	16-Mar-2017	10543334	28-Jan-2020	31-Jan-2038	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	MRI COMPATIBLE THERAPEUTIC GAS DELIVERY CART	29/544072	30-Oct-2015	D776279	10-Jan-2017	10-Jan-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	MRI COMPATIBLE THERAPEUTIC GAS DELIVERY CART	29/578295	20-Sep-2016	D807510	09-Jan-2018	30-Oct-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	DRY POWDER FIBRIN SEALANT	13/520632	29-Aug-2012	8846105	30-Sep-2014	07-Jan-2031	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	MEDICAL INSTRUMENTS	29/339045	23-Jun-2009	D628692	07-Dec-2010	07-Dec-2024	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	POWDER DELIVERY DEVICE	13/995267	18-Jun-2013	10010705	03-Jul-2018	02-Dec-2034	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	MEDICAL INSTRUMENT	29/394931	23-Jun-2011	D683851	04-Jun-2013	04-Jun-2027	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	USE AND MONITORING OF INHALED NITRIC OXIDE WITH LEFT VENTRICULAR ASSIST DEVICES	15/418837	30-Jan-2017	10398820	03-Sep-2019	29-Apr-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	USE AND MONITORING OF INHALED NITRIC OXIDE WITH LEFT VENTRICULAR ASSIST DEVICES	16/077276	10-Aug-2018	11202899	21-Dec-2021	19-Jun-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	COMPENSATING FOR DISRUPTIONS IN BREATHING GAS FLOW MEASUREMENT	15/420689	31-Jan-2017	10478584	19-Nov-2019	31-Oct-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	COMPENSATING FOR DISRUPTIONS IN BREATHING GAS FLOW MEASUREMENT	16/598786	10-Oct-2019	11291764	5-Apr-2022	28-Sept-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	MRI COMPATIBLE THERAPEUTIC GAS INJECTOR MODULE	29/544067	30-Oct-2015	D776278	10-Jan-2017	10-Jan-2032	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	MRI COMPATIBLE THERAPEUTIC GAS INJECTOR MODULE	29/578294	20-Sep-2016	D797935	19-Sep-2017	30-Oct-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	MRI COMPATIBLE THERAPEUTIC GAS INJECTOR MODULE	29/614133	16-Aug-2017	D823472	17-Jul-2018	30-Oct-2035	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	Methylphenidate HCl Oral Solution	10/554133	20-Oct-2005	7691880	06-Apr-2010	07-Oct-2024	Granted	SPECGX LLC
United States of America	DYE-AZIDE COMPOSITIONS FOR DUAL PHOTOTHERAPY	11/931683	31-Oct-2007	8658433	25-Feb-2014	02-Aug-2023	Granted	SPECGX LLC
United States of America	METHOD OF PURIFYING CRUDE NOSCAPINE	12/586850	29-Sep-2009	8394814	12-Mar-2013	18-Sep-2031	Granted	SPECGX LLC

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REEL: 065601 FRAME: 0432

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PROCESS FOR THE PREPARATION OF 6-BETA-HYDROXY MORPHINAN COMPOUNDS	12/485200	16-Jun-2009	8168790	01-May-2012	23-Jul-2030	Granted	SPECGX LLC
United States of America	DIAZA HETEROCYCLIC COMPOUNDS FOR PHOTOTHERAPY	13/319771	10-Nov-2011	9186349	17-Nov-2015	05-Jun-2030	Granted	MALLINCKR ODT LLC
United States of America	PROCESSES FOR THE SYNTHESIS OF FIVE AND SIX MEMBERED HETEROCYCLIC RINGS	12/558646	14-Sep-2009	8252928	28-Aug-2012	26-Nov-2030	Granted	SPECGX LLC
United States of America	PROCESSES FOR THE SELECTIVE AMINATION OF KETOMORPHINANS	12/586844	29-Sep-2009	8269006	18-Sep-2012	19-Dec-2030	Granted	SPECGX LLC
United States of America	BERBERINE COMPOUNDS AND PROCESSES FOR THE PREPARATION OF BERBERINE COMPOUNDS	12/586834	29-Sep-2009	8163912	24-Apr-2012	18-Dec-2030	Granted	SPECGX LLC
United States of America	PROCESSES FOR THE ALKYLATION OF NORBUPRENORPHINE WITH REDUCED IMPURITY FORMATION	12/586854	29-Sep-2009	8293906	23-Oct-2012	11-Jan-2031	Granted	SPECGX LLC

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PROCESSES FOR THE SYNTHESIS OF TERTIARY AMINES	12/586843	29-Sep-2009	8080661	20-Dec-2011	24-Aug-2030	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF BUPRENORPHINE AND DERIVATIVES OF BUPRENORPHINE	12/316861	17-Dec-2008	8017777	13-Sep-2011	07-Jun-2030	Granted	SPECGX LLC
United States of America	PROCESS AND COMPOUNDS FOR THE PRODUCTION OF (+) OPIATES	12/316862	17-Dec-2008	8252808	28-Aug-2012	12-Dec-2030	Granted	SPECGX LLC
United States of America	SINOMENINE DERIVATIVES AND PROCESSES FOR THEIR SYNTHESIS	12/316846	17-Dec-2008	8461337	11-Jun-2013	02-Dec-2030	Granted	SPECGX LLC
United States of America	SINOMENINE DERIVATIVES AND PROCESSES FOR THEIR SYNTHESIS	13/352668	18-Jan-2012	8614224	24-Dec-2013	17-Dec-2028	Granted	SPECGX LLC
United States of America	PROCESSES FOR THE PRODUCTION OF (+)-"NAL" MORPHINAN COMPOUNDS	12/316974	17-Dec-2008	8067596	29-Nov-2011	31-Mar-2030	Granted	SPECGX LLC
United States of America	PROCESSES FOR THE PREPARATION OF NORMORPHINAN SALTS	12/316887	17-Dec-2008	8101757	24-Jan-2012	26-Jul-2030	Granted	SPECGX LLC



Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	COMPOUNDS AND COMPOSITIONS FOR USE IN PHOTOTHERAPY AND IN TREATMENT OF OCULAR NEOVASCULAR DISEASE AND CANCERS	13/383243	10-Jan-2012	8829020	09-Sep-2014	16-Jul-2030	Granted	SPECGX LLC
United States of America	COMPOUNDS AND COMPOSITIONS FOR USE IN PHOTOTHERAPY AND IN TREATMENT OF OCULAR NEOVASCULAR DISEASE AND CANCERS	14/316415	26-Jun-2014	9518062	13-Dec-2016	16-Jul-2030	Granted	SPECGX LLC
United States of America	COMPOUNDS AND COMPOSITIONS FOR USE IN PHOTOTHERAPY AND IN TREATMENT OF OCULAR NEOVASCULAR DISEASE AND CANCERS	14/316443	26-Jun-2014	9527858	27-Dec-2016	16-Jul-2030	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PROCESSES FOR THE SYNTHESIS OF OPIATE ALKALOIDS WITH REDUCED IMPURITY FORMATION	12/586841	29-Sep-2009	8232396	31-Jul-2012	18-Dec-2030	Granted	SPECGX LLC
United States of America	PROCESSES FOR THE PRODUCTION OF BUPRENORPHINE WITH REDUCED IMPURITY FORMATION	12/586855	29-Sep-2009	8232397	31-Jul-2012	01-Jan-2031	Granted	SPECGX LLC
United States of America	SYNTHESIS OF METHYLPHENIDATE AND ANALOGS THEREOF	12/652894	06-Jan-2010	8283472	09-Oct-2012	23-Jun-2031	Granted	SPECGX LLC
United States of America	(+)-MORPHINANUM N-OXIDES AND PROCESSES FOR THEIR PRODUCTION	12/710383	23-Feb-2010	8563727	22-Oct-2013	09-Sep-2031	Granted	SPECGX LLC
United States of America	(+)-MORPHINANUM QUATERNARY SALTS AND PROCESSES FOR THEIR PRODUCTION	12/710379	23-Feb-2010	8436174	07-May-2013	21-Mar-2031	Granted	SPECGX LLC
United States of America	PROCESSES FOR INCREASING THE YIELD OF OPIATE ALKALOID DERIVATIVES	12/586842	29-Sep-2009	8227608	24-Jul-2012	18-Dec-2030	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SOLID SUPPORT FOR FMOC-SOLID PHASE SYNTHESIS OF PEPTIDE ACIDS	12/773324	04-May-2010	8742028	03-Jun-2014	05-Jul-2032	Granted	SPECGX LLC
United States of America	(+)-6-HYDROXY-MORPHINAN OR (+)-6-AMINO-MORPHINAN DERIVATIVES	12/710390	23-Feb-2010	8563724	22-Oct-2013	29-Sep-2031	Granted	SPECGX LLC
United States of America	PREPARATION OF SATURATED KETONE MORPHINAN COMPOUNDS BY CATALYTIC ISOMERIZATION	12/757064	09-Apr-2010	8293907	23-Oct-2012	10-Dec-2030	Granted	SPECGX LLC
United States of America	(+)-6-HYDROXY-MORPHINAN OR (+)-6-AMINO-MORPHINAN DERIVATIVES	14/045009	03-Oct-2013	8946419	03-Feb-2015	23-Feb-2030	Granted	SPECGX LLC
United States of America	PROCESS FOR THE REDUCTIVE ALKYLATION OF NORMORPHINANS	12/706909	17-Feb-2010	8431701	30-Apr-2013	20-Mar-2031	Granted	SPECGX LLC
United States of America	ONE-POT PREPARATION OF HEXAHYDROISOQUINOLINES FROM AMIDES	12/889484	24-Sep-2010	8431705	30-Apr-2013	14-Apr-2031	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	ONE-POT PREPARATION OF HEXAHYDROISOQUINOLINES FROM AMIDES	13/749805	25-Jan-2013	8921561	30-Dec-2014	04-Oct-2030	Granted	SPECGX LLC
United States of America	ONE-POT PREPARATION OF HEXAHYDROISOQUINOLINES FROM DIHYDROISOQUINOLINE	12/889502	24-Sep-2010	8415474	09-Apr-2013	13-Apr-2031	Granted	SPECGX LLC
United States of America	METHODS FOR PRODUCING HYDROCODONE, HYDROMORPHONE OR A DERIVATIVE THEREOF	12/885851	20-Sep-2010	8399671	19-Mar-2013	11-May-2031	Granted	SPECGX LLC
United States of America	PREPARATION OF SATURATED KETONE MORPHINAN COMPOUNDS	12/757098	09-Apr-2010	9040705	26-May-2015	26-Nov-2031	Granted	SPECGX LLC
United States of America	HETEROGENEOUS RUTHENIUM METAL CATALYST FOR THE PRODUCTION OF HYDROCODONE, HYDROMORPHONE OR A DERIVATIVE THEREOF	12/886621	21-Sep-2010	8383815	26-Feb-2013	11-May-2031	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	REDUCTIVE AMINATION OF 6-KETO NORMORPHONES BY CATALYTIC HYDROGEN TRANSFER	12/797640	10-Jun-2010	8471023	25-Jun-2013	23-Apr-2031	Granted	SPECGX LLC
United States of America	PREPARATION OF 10-KETO MORPHINANS BY BENZYLIC OXIDATION	12/876284	07-Sep-2010	8314237	20-Nov-2012	01-Apr-2031	Granted	SPECGX LLC
United States of America	METHOD FOR THE ENRICHMENT OF BUPRENORPHINE USING CHROMATOGRAPHIC TECHNIQUES	12/818230	18-Jun-2010	8492547	23-Jul-2013	11-May-2031	Granted	SPECGX LLC
United States of America	PREPARATION OF 6-ALPHA-AMINO N-SUBSTITUTED MORPHINANS BY CATALYTIC HYDROGEN TRANSFER	12/797642	10-Jun-2010	8519133	27-Aug-2013	08-Apr-2031	Granted	SPECGX LLC
United States of America	N-DE METHYLATION OF 6-KETO MORPHINANS	13/196929	03-Aug-2011	8624030	07-Jan-2014	25-Apr-2032	Granted	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PHARMACEUTICAL PRODUCT BLISTER PACK LOCKABLE WITHIN SECONDARY PACKAGING	13/215864	23-Aug-2011	8991606	31-Mar-2015	11-Nov-2031	Granted	SPECGX LLC
United States of America	REDUCTIVE AMINATION OF 6-KETO MORPHINANS BY CATALYTIC HYDROGEN TRANSFER	13/491676	08-Jun-2012	9296699	29-Mar-2016	08-Apr-2031	Granted	SPECGX LLC
United States of America	TANDEM PROCESS FOR PREPARING N-ALKYL MORPHINANS	13/196921	03-Aug-2011	8703949	22-Apr-2014	14-Feb-2032	Granted	SPECGX LLC
United States of America	PEN-TYPE PHARMACEUTICAL PRODUCT DISPENSER	13/103234	09-May-2011	9016516	28-Apr-2015	04-Jul-2031	Granted	SPECGX LLC
United States of America	METHOD AND APPARATUS FOR DISPOSAL OF A PHARMACEUTICAL PRODUCT BLISTER CARD	14/336357	21-Jul-2014				Published	SPECGX LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SEALABLE SECONDARY PACKAGING FOR PHARMACEUTICAL PRODUCT BLISTER PACK	13/103247	09-May-2011	8342331	01-Jan-2013	09-May-2031	Granted	SPECGX LLC
United States of America	SEALABLE SECONDARY PACKAGING FOR PHARMACEUTICAL PRODUCT BLISTER PACK	13/691766	01-Dec-2012	8627957	14-Jan-2014	09-May-2031	Granted	SPECGX LLC
United States of America	SEALABLE SECONDARY PACKAGING FOR PHARMACEUTICAL PRODUCT BLISTER PACK	14/092559	27-Nov-2013	9120607	01-Sep-2015	09-May-2031	Granted	SPECGX LLC
United States of America	SEALABLE SECONDARY PACKAGING FOR PHARMACEUTICAL PRODUCT BLISTER PACK	14/716269	19-May-2015	9579252	28-Feb-2017	09-May-2031	Granted	SPECGX LLC
United States of America	(+)-MORPHINANS AS ANTAGONISTS OF TOLL-LIKE RECEPTOR 9 AND THERAPEUTIC USES THEREOF	14/814580	31-Jul-2015	10363251	30-Jul-2019	09-May-2029	Granted	MALLINCKR ODT LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	(+)-MORPHINAN COMPOUNDS AS SMALL MOLECULE ANTAGONISTS OF TOLL-LIKE RECEPTOR 9	15/255979	02-Sep-2016	10604488	31-Mar-2020	09-May-2029	Granted	MALLINCKR ODT LLC
United States of America	DISPOSABLE TRANSDERMAL PATCH PACKAGING	13/014876	27-Jan-2011	8925727	06-Jan-2015	12-Apr-2033	Granted	SPECGX LLC
United States of America	PROCESS FOR THE PREPARATION OF SUFENTANIL BASE AND RELATED COMPOUNDS	13/233227	15-Sep-2011	8946433	03-Feb-2015	22-Apr-2032	Granted	SPECGX LLC
United States of America	(+) - MORPHINANS AS ANTAGONISTS OF TOLL-LIKE RECEPTOR 9 AND THERAPEUTIC USES THEREOF	12/975407	22-Dec-2010	9562014	07-Feb-2017	09-May-2029	Granted	MALLINCKR ODT LLC
United States of America	CONTAINER AND METHOD FOR FACILITATING DISPOSAL OF UNUSED PHARMACEUTICAL PRODUCT	13/015490	27-Jan-2011	8490795	23-Jul-2013	21-Feb-2031	Granted	SPECGX LLC



Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	CONTAINER AND METHOD FOR FACILITATING DISPOSAL OF UNUSED PHARMACEUTICAL PRODUCT	13/925680	24-Jun-2013	9005098	14-Apr-2015	27-Jan-2031	Granted	SPECGX LLC
United States of America	PHARMACEUTICAL PRODUCT CONTAINER WITH PERMANENT LOCKING MECHANISM	14/488048	16-Sep-2014	9414989	16-Aug-2016	07-Sep-2031	Granted	SPECGX LLC
United States of America	APPARATUSES AND METHODS FOR STORING PHARMACEUTICAL PRODUCT	13/014896	27-Jan-2011	8910456	16-Dec-2014	21-Sep-2033	Granted	SPECGX LLC
United States of America	SYSTEMS AND METHODS FOR MANAGING USE OF A MEDICAMENT	13/015480	27-Jan-2011	9046403	02-Jun-2015	27-Jan-2031	Granted	SPECGX LLC
United States of America	SYSTEMS AND METHOD FOR TIMING DOSAGE PERIODS	13/015223	27-Jan-2011	8842501	23-Sep-2014	27-Jan-2031	Granted	SPECGX LLC

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PREPARATION OF SATURATED KETONE MORPHINAN COMPOUNDS HAVING LOW METAL CONTENT	13/093892	26-Apr-2011	8563725	22-Oct-2013	13-Feb-2032	Granted	SPECGX LLC
United States of America	PRODUCTION OF ALKALOIDS WITHOUT THE ISOLATION OF INTERMEDIATES	13/606370	07-Sep-2012	8624031	07-Jan-2014	07-Sep-2032	Granted	SPECGX LLC
United States of America	METHOD FOR TREATING ABDOMINAL DISCOMFORT	10/745689	29-Dec-2003	7795312	14-Sep-2010	29-Dec-2023	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	ENTERIC COATED COMPOSITION COMPRISING PROSTAGLANDIN ANALOGS AS CHLORIDE CHANNEL OPENER	10/562637	01-Jun-2006	8337891	25-Dec-2012	05-Jul-2024	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	CHLORIDE CHANNEL OPENER	10/231341	30-Aug-2002	7064148	20-Jun-2006	30-Aug-2022	Granted	SUCAMPO PHARMA AMERICAS LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	CHLORIDE CHANNEL OPENER	11/333511	18-Jan-2006	7253295	07-Aug-2007	30-Aug-2022	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	TOCOPHEROL AND TOCOPHERYL QUINONE DERIVATIVES AS CORRECTORS OF LYSOSOMAL STORAGE DISORDERS	15/608753	30-May-2017	10370348	06-Aug-2019	14-Nov-2033	Granted	VTESSE LLC
United States of America	TOCOPHEROL AND TOCOPHERYL QUINONE DERIVATIVES AS CORRECTORS OF LYSOSOMAL STORAGE DISORDERS	14/442637	13-May-2015	9663485	30-May-2017	14-Nov-2033	Granted	VTESSE LLC
United States of America	USE OF DELTA TOCOPHEROL FOR THE TREATMENT OF LYSOSOMAL STORAGE DISORDERS	13/810774	17-Jan-2013	9044451	02-Jun-2015	26-Sep-2031	Granted	VTESSE LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	USE OF DELTA TOCOPHEROL FOR THE TREATMENT OF LYSSOMAL STORAGE DISORDERS	15/239753	17-Aug-2016	10039741	07-Aug-2018	26-Sep-2031	Granted	VTESSE LLC
United States of America	ANTI-CONSTIPATION COMPOSITION	09/655760	05-Sep-2000	6414016	02-Jul-2002	05-Sep-2020	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	ANTI-CONSTIPATION COMPOSITION	11/142251	02-Jun-2005	8071613	06-Dec-2011	05-Sep-2020	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	ANTI-CONSTIPATION COMPOSITION	13/274612	17-Oct-2011	8114890	14-Feb-2012	05-Sep-2020	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	ANTI-CONSTIPATION COMPOSITION	13/337488	27-Dec-2011	8748454	10-Jun-2014	05-Sep-2020	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	CYCLODEXTRIN FOR THE TREATMENT OF LYSSOMAL STORAGE DISEASES	15/620753	12-Jun-2017	11020422	01-Jun-2021	19-Jun-2031	Granted	VTESSE LLC
United States of America	ABUSE DETERRENT IMMEDIATE RELEASE CAPSULE DOSAGE FORMS	16/574699	18-Sep-2019				Published	SPECGX LLC

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	NOVEL COMPOSITION AND METHOD FOR STABILIZING THE SAME	09/688351	16-Oct-2000	6583174	24-Jun-2003	16-Oct-2020	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	NOVEL COMPOSITION AND METHOD FOR STABILIZING THE SAME	10/383581	10-Mar-2003	7417067	26-Aug-2008	16-Oct-2020	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	NOVEL COMPOSITION AND METHOD FOR STABILIZING THE SAME	12/144000	23-Jun-2008	8088934	03-Jan-2012	18-May-2021	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	NOVEL COMPOSITION AND METHOD FOR STABILIZING THE SAME	13/289386	04-Nov-2011	8097649	17-Jan-2012	16-Oct-2020	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	COMPOSITION FOR TREATING DRUG-INDUCED CONSTIPATION WITH 15-KETO-PROSTAGLANDINS	10/135397	01-May-2002	6982283	03-Jan-2006	01-May-2022	Granted	SUCAMPO PHARMA AMERICAS LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	DOSAGE UNIT COMPRISING A PROSTAGLANDIN ANALOG FOR TREATING CONSTIPATION	10/293516	14-Nov-2002	8097653	17-Jan-2012	14-Nov-2022	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	DOSAGE UNIT COMPRISING A PROSTAGLANDIN ANALOG FOR TREATING CONSTIPATION	13/330942	20-Dec-2011	8389542	05-Mar-2013	14-Nov-2022	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR PROVIDING A CATHARTIC EFFECT	10/147980	20-May-2002	6959056	18-Oct-2005	20-May-2022	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR PROVIDING A CATHARTIC EFFECT	11/190842	28-Jul-2005	7459583	02-Dec-2008	20-May-2022	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	COMPOSITIONS COMPRISING ORNITHINE AND PHENYLACETATE OR PHENYL BUTYRATE FOR TREATING HEPATIC ENCEPHALOPATHY	13/495966	13-Jun-2012	9566257	14-Feb-2017	28-Nov-2025	Granted	OCERA THERAPEUTICS, INC.

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	COMPOSITIONS COMPRISING ORNITHINE AND PHENYLACETATE OR PHENYL BUTYRATE FOR TREATING HEPATIC ENCEPHALOPATHY	15/430233	10-Feb-2017	10610506	07-Apr-2020	25-Nov-2025	Granted	OCERA THERAPEUTTI CS, INC.
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	12/753763	02-Apr-2010	8173706	08-May-2012	01-Jan-2031	Granted	OCERA THERAPEUTTI CS, INC.
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	13/436642	30-Mar-2012	8492439	23-Jul-2013	02-Apr-2030	Granted	OCERA THERAPEUTTI CS, INC.
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	13/937107	08-Jul-2013	8785498	22-Jul-2014	02-Apr-2030	Granted	OCERA THERAPEUTTI CS, INC.
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	14/299940	09-Jun-2014	9034925	19-May-2015	02-Apr-2030	Granted	OCERA THERAPEUTTI CS, INC.
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	14/715481	18-May-2015	9604909	28-Mar-2017	02-Apr-2030	Granted	OCERA THERAPEUTTI CS, INC.

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	15/469359	24-Mar-2017	10173964	08-Jan-2019	02-Apr-2030	Granted	OCERA THERAPEUTIC CS, INC.
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	16/037655	17-Jul-2018	10550069	04-Feb-2020	02-Apr-2030	Granted	OCERA THERAPEUTIC CS, INC.
United States of America	TREATMENT OF PORTAL HYPERTENSION AND RESTORATION OF LIVER FUNCTION USING L-ORNITHINE PHENYLACETATE	15/817847	20-Nov-2017	11266620	08-Mar-2022	08-Jun-2030	Granted	OCERA THERAPEUTIC CS, INC.
United States of America	METHODS OF MAKING L-ORNITHINE PHENYL ACETATE	13/878146	05-Apr-2013	8946473	03-Feb-2015	18-Jan-2032	Granted	OCERA THERAPEUTIC CS, INC.
United States of America	TREATMENT OF DISEASES ASSOCIATED WITH HEPATIC STELLATE CELL ACTIVATION USING AMMONIA-LOWERING THERAPIES	16/026403	03-Jul-2018	10525029	07-Jan-2020	23-Nov-2035	Granted	OCERA THERAPEUTIC CS, INC.



Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	TREATMENT OF DISEASES ASSOCIATED WITH HEPATIC STELLATE CELL ACTIVATION USING AMMONIA-LOWERING THERAPIES	15/527999	18-May-2017	10039735	07-Aug-2018	23-Nov-2035	Granted	OCERA THERAPEUTTI CS, INC.
United States of America	METHODS OF MAKING L-ORNITHINE PHENYL ACETATE	14/601591	21-Jan-2015	9260379	16-Feb-2016	05-Oct-2031	Granted	OCERA THERAPEUTTI CS, INC.
United States of America	TREATMENT AND PREVENTION OF MUSCLE LOSS USING L-ORNITHINE IN COMBINATION WITH AT LEAST ONE OF PHENYLACETATE AND PHENYLBUTYRATE	15/750009	02-Feb-2018	10835506	17-Nov-2020	16-Aug-2036	Granted	OCERA THERAPEUTTI CS, INC.
United States of America	PROCESSES OF MAKING L-ORNITHINE PHENYLACETATE	16/611193	05-Nov-2019	11066352	20-Jul-2021	07-May-2038	Granted	OCERA THERAPEUTTI CS, INC.

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	TREATMENT AND PREVENTION OF NEURONAL CELL LOSS USING L-ORNITHINE IN COMBINATION WITH AT LEAST ONE OF PHENYLACETATE AND PHENYLBUTYRATE	15/751442	08-Feb-2018				Published	OCERA THERAPEUTICS, INC.
United States of America	FORMULATIONS OF L-ORNITHINE PHENYLACETATE	15/349910	11-Nov-2016	11219611	11-Jan-2022	19-Apr-2036	Granted	OCERA THERAPEUTICS, INC.
United States of America	METHODS OF ASSESSING AND TREATING HEPATIC ENCEPHALOPATHY	17/605699	22-Oct-2021				Pending	OCERA THERAPEUTICS, INC.
United States of America	Methods of Using Inhaled Nitric Oxide Gas for Treatment of Acute Respiratory Distress Syndrome in Children	17/458202	26-Aug-2021				Pending	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
United States of America	USE OF APOPTOTIC CELLS EX VIVO TO GENERATE REGULATORY T CELLS	17/458206	26-Aug-2021				Published	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PRE-FILLED MANUAL INJECTOR APPARATUS	63/238543	30-Aug-2021			30-Aug-2022	Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD OF TREATING PATIENTS WITH HEPATORENAL SYNDROME TYPE 1	17/340765	07-Jun-2021				Publishe d	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	ALLOGENEIC CULTURED KERATINOCYTE PRODUCTS	63/224706	22-Jul-2021			22-Jul-2022	Pending	STRATATEC H CORPORATI ON
United States of America	ALLOGENEIC CULTURED KERATINOCYTE PRODUCTS	63/227119	29-Jul-2021			29-Jul-2022	Pending	STRATATEC H CORPORATI ON
United States of America	SYSTEMS AND METHODS FOR HIGH HUMIDITY CURING WITHIN TABLET COATING SYSTEM	17/388957	29-Jul-2021				Publishe d	SPECGX LLC

PATENT

REEL: 065601 FRAME: 0453

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	GAS SENSOR MODULE	17/299171	02-Jun-2021				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	GAS DELIVERY SYSTEM	17/598058	24-Sep-2021				Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS OF MODULATING CORTICOSTEROID RESPONSE	17/362497	29-Jun-2021				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	USE AND MONITORING OF INHALED NITRIC OXIDE WITH LEFT VENTRICULAR ASSIST DEVICES	17/358738	25-Jun-2021				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS TO IMPROVE ORGAN VIABILITY	17/360916	28-Jun-2021				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS OF USING INHALED NITRIC OXIDE GAS FOR TREATMENT OF ACUTE RESPIRATORY DISTRESS SYNDROME	63/222092	15-Jul-2021			15-Jul-2022	Pending	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	Devices and Methods for Engaging Indexed Valve and Pressure Canister Assembly with Collar and for Linear Actuation by Plunger Assembly into Fluid Communication with Device for Regulating Drug Delivery	17/509556	25-Oct-2021				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	PHARMACEUTICAL COMPOSITION COMPRISING A BICYCLIC COMPOUND AND METHOD FOR STABILIZING THE BICYCLIC COMPOUND	11/656513	23-Jan-2007	7985770	26-Jul-2011	23-Jan-2027	Granted	SUCAMPO PHARMA AMERICAS LLC

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REEL: 065601 FRAME: 0455

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	PHARMACEUTICAL COMPOSITION COMPRISING A BI-CYCLIC COMPOUND AND METHOD FOR STABILIZING THE BI-CYCLIC COMPOUND	13/161060	15-Jun-2011	8669284	11-Mar-2014	03-Aug-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR PREPARING A FATTY ACID DERIVATIVE	13/538189	29-Jun-2012	9242950	26-Jan-2016	16-Apr-2033	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	APPARATUS AND METHOD FOR DETECTING LIQUID LEVEL IN A CLEAR OR PARTIALLY CLEAR CONTAINER	16/724786	23-Dec-2019				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	Systems And Methods For Delivery Of Therapeutic Gas	16/748319	21-Jan-2020				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	NEW MICROPARTICLE FORMULATION OF LUBIPROTONE	16/338948	02-Apr-2019				Published	SUCAMPO PHARMA AMERICAS LLC

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REEL: 065601 FRAME: 0456

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHOD FOR PREPARING 15-KETO-PROSTAGLANDIN E DERIVATIVE	11/703098	07-Feb-2007	7355064	08-Apr-2008	07-Feb-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR MANUFACTURING PROSTAGLANDIN ANALOGUE	11/193373	01-Aug-2005	7321057	22-Jan-2008	01-Aug-2025	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR PREPARING PROSTAGLANDIN DERIVATIVE	11/703138	07-Feb-2007	7812182	12-Oct-2010	07-Feb-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR PREPARING PROSTAGLANDIN DERIVATIVE	12/762890	19-Apr-2010	8236969	07-Aug-2012	14-Sep-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR PREPARING PROSTAGLANDIN DERIVATIVE	12/762906	19-Apr-2010	8304562	06-Nov-2012	20-Aug-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR PREPARING PROSTAGLANDIN DERIVATIVE	12/762917	19-Apr-2010	8389748	05-Mar-2013	26-Jul-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	SOFT-GELATIN CAPSULE FORMULATION	11/656476	23-Jan-2007	8026393	27-Sep-2011	23-Jan-2027	Granted	SUCAMPO PHARMA AMERICAS LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	SOFT-GELATIN CAPSULE FORMULATION	13/210556	16-Aug-2011	8338639	25-Dec-2012	23-Jan-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	SOFT-GELATIN CAPSULE FORMULATION	13/679005	16-Nov-2012	8779187	15-Jul-2014	23-Jan-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR TREATING GASTROINTESTINAL DISORDER	11/216012	01-Sep-2005	8748481	10-Jun-2014	01-Sep-2025	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	PHARMACEUTICAL COMBINATION OF OPIOID AND PROSTAGLANDIN COMPOUND	15/805759	07-Nov-2017	10561649	18-Feb-2020	02-Jul-2028	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD FOR PROMOTING GASTROINTESTINAL BICARBONATE SECRETION	11/850271	05-Sep-2007	7868045	11-Jan-2011	05-Sep-2027	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	METHOD AND COMPOSITION FOR PROMOTING GASTROINTESTINAL BICARBONATE SECRETION	12/952626	23-Nov-2010	8530519	10-Sep-2013	05-Sep-2027	Granted	SUCAMPO PHARMA AMERICAS LLC



Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHOD FOR TREATING DAMAGE INDUCED BY AN ANTI-TUMOR AGENT, TREATING MUCCOSITIS AND TREATING TUMOR	12/882794	15-Sep-2001	9084815	21-Jul-2015	15-Sep-2021	Granted	SUCAMPO PHARMA AMERICAS LLC
United States of America	Methods of Administering High Concentrations of Nitric Oxide	16/785983	10-Feb-2020				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	Camnula for Minimizing Dilution of Dosing During Nitric Oxide Delivery	16/785978	10-Feb-2020				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHOD OF IDENTIFYING AND TREATING PREMATURE INFANTS AT RISK FOR BPD	16/803719	27-Feb-2020				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHODS FOR TREATING ACUTE WOUNDS AND IMPROVING OUTCOMES	62/979649	21-Feb-2020				Pending	STRATATEC HOLDING CORPORATION

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	TAMPER RESISTANT FORMULATIONS FOR ORAL SOLID EXTENDED RELEASE DOSAGE FORMS	16/818528	13-Mar-2020				Published	SPECGX LLC
United States of America	INTELLIGENT GAS SOURCE MANAGEMENT	16/825840	20-Mar-2020	11285280	29-March-2022	11-May-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHODS FOR INTELLIGENT GAS SOURCE MANAGEMENT	16/825848	20-Mar-2020	11090454	17-Aug-2021	11-May-2035	Granted	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHOD OF TREATING PATIENTS WITH HEPATORENAL SYNDROME TYPE 1	16/828674	24-Mar-2020				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHOD OF TREATING PATIENTS WITH HEPATORENAL SYNDROME TYPE 1	16/828681	24-Mar-2020				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	L-ORNITHINE PHENYL ACETATE AND METHODS OF MAKING THEREOF	16/778696	31-Jan-2020	11161802	02-Nov-2021	08-Jul-2030	Granted	OCERA THERAPEUTICS, INC.
United States of America	(+)-MORPHINAN COMPOUNDS AS SMALL MOLECULE ANTAGONISTS OF TOLL-LIKE RECEPTOR 9	16/779796	03-Feb-2020	11142502	12-Oct-2021	16-Jul-2030	Granted	MALLINCKR ODT LLC
United States of America	SYSTEM AND METHOD OF ADMINISTERING A PHARMACEUTICAL GAS TO A PATIENT	16/779912	03-Feb-2020				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	ADMINISTRATION AND MONITORING OF NITRIC OXIDE IN EX VIVO FLUIDS	16/856632	23-Apr-2020				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	APPARATUS AND METHOD FOR FILTERING LIQUID PARTICLES FROM INSPIRATORY GAS FLOW OF A PATIENT BREATHING CIRCUIT AFFILIATED WITH A VENTILATOR AND/OR NITRIC OXIDE DELIVERY SYSTEM	16/864321	01-May-2020	11278696	22-Mar-2022	01-Mar-2037	Granted	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	REPOSITORY CORTICOTROPIN INJECTION EFFECTS IN PATIENTS WITH REFRACTORY SYSTEMIC LUPUS ERYTHEMATOSUS DESPITE TREATMENT WITH GLUCOCORTICIDS	63/018894	01-May-2020			01-May-2021	Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	DOSAGES AND USES OF ORNITHINE PHENYLACETATE FOR TREATING HYPERAMMONEMIA	63/034602	04-Jun-2020			04-Jun-2021	Pending	MALLINCKR ODT ENTERPRISE S LLC
United States of America	BIOENGINEERED HUMAN SKIN CONSTRUCT	63/024258	13-May-2020			13-May-2021	Pending	STRATATEC H CORPORATI ON

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS TO INCREASE FUNCTIONAL CAPACITY AND QUALITY OF LIFE IN BRONCHIETASIS PATIENTS WITH NONTUBERCULOUS MYCOBACTERIA	16/875000	15-May-2020				Published	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
United States of America	USES OF ORNITHINE PHENYLACETATE FOR TREATING HYPERAMMONEMIA	63/028874	22-May-2020			22-May-2021	Pending	OCERA THERAPEUTICS, INC.
United States of America	HIGH-PURITY LARGE-SCALE PREPARATION OF STANNOPORFIN	16/864510	01-May-2020	11078220	03-Aug-2021	01-May-2040	Granted	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
United States of America	ABUSE DETERRENT IMMEDIATE RELEASE FORMULATIONS COMPRISING NON-CELLULOSE POLYSACCHARIDES ENGINEERED SKIN CONSTRUCT OVERLAY OF AUTOGRAFT	16/990711	11-Aug-2020				Published	SPECGX LLC
United States of America		63/049447	08-Jul-2020			08-Jul-2021	Pending	STRATATEC HOLDING CORPORATION

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	DEVICES, METHODS AND SYSTEMS FOR PRIMING, SEPARATING, AND COLLECTING BLOOD COMPONENTS	16/906976	19-Jun-2020				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	CANNULA FOR MINIMIZING DILUTION OF DOSING DURING NITRIC OXIDE DELIVERY	17/175779	15-Feb-2021				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	PROCESSING BLOOD	17/176013	15-Feb-2021				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	REPOSITORY CORTICOTROPIN INJECTION ENHANCED REMYELINATION AFTER CUPRIZONE-INDUCED DEMYELINATION	17/420622	02-Jul-2021				Pending	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	VIABLE BIOENGINEERED SKIN CONSTRUCTS	17319760	13-Mar-2021				Published	STRATATEC PHARMACEUTICALS IRELAND LIMITED

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REEL: 065601 FRAME: 0464

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	System and Method of Administering a Pharmaceutical Gas to a Patient	17/215686	29-Mar-2021				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHODS FOR MODULATING PERICYTES	17/185586	25-Feb-2021				Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	ALLOGENEIC CULTURED KERATINOCYTE PRODUCTS	63/194672	28-May-2021			28-May-2022	Pending	STRATATEC H CORPORATION
United States of America	METHODS FOR PRIMING ALLOGENEIC CULTURED KERATINOCYTE COMPOSITIONS FOR TOPICAL USE	63/194687	28-May-2021			28-May-2022	Pending	STRATATEC H CORPORATION
United States of America	TISSUE CONTAINER SYSTEMS	63/194682	28-May-2021			28-May-2022	Pending	STRATATEC H CORPORATION

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	STRATAGRAFT SECRETES SOLUBLE FACTORS ASSOCIATED WITH REGENERATIVE WOUND HEALING	63/208309	08-Jun-2021			08-Jun-2022	Pending	STRATATEC H CORPORATI ON
United States of America	SYSTEMS AND METHODS FOR PROVIDING A PULSE OF A THERAPEUTIC GAS WITH A DESIRED FLOW PROFILE TO MAXIMIZE THERAPEUTIC EFFECTIVENESS	17/007603	31-Aug-2020				Publishe d	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	REPOSITORY CORTICOTROPIN INJECTION EFFECTS IN PATIENTS WITH REFRACTORY SYSTEMIC LUPUS ERYTHEMATOSUS DESPITE TREATMENT WITH GLUCOCORTICOIDS	63/079315	16-Sep-2020			16-Sep-2021	Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHODS FOR MODULATING CORTICOSTEROID RESPONSE	63/083532	25-Sep-2020			25-Sep-2021	Pending	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	SYSTEMS AND METHOD FOR DELIVERY OF THERAPEUTIC GAS TO PATIENTS, IN NEED THEREOF, RECEIVING BREATHING GAS FROM A VENTILATOR THAT VARIES AT LEAST PRESSURE AND/OR FLOW USING ENHANCED THERAPEUTIC GAS (NO) FLOW MEASUREMENT	17/078821	23-Oct-2020				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED
United States of America	METHOD OF TREATING PATIENTS WITH HEPATORENAL SYNDROME TYPE 1 AND LOW MEAN ARTERIAL PRESSURE	17/083409	29-Oct-2020				Published	MALLINCKR ODT PHARMACE UTICALS IRELAND LIMITED

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REEL: 065601 FRAME: 0467

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	METHOD OF TREATING PATIENTS WITH HEPATORENAL SYNDROME TYPE 1	17/104864	25-Nov-2020				Pending	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	PREPARATION OF SUFFENTANIL CITRATE AND SUFFENTANIL BASE	17/091109	06-Nov-2020				Published	SPECGX LLC
United States of America	HUMAN SKIN EQUIVALENTS EXPRESSING EXOGENOUS POLYPEPTIDES	17/141945	05-Jan-2021				Published	STRATATEC H CORPORATION
United States of America	DEVICE AND METHOD FOR DIFFUSING HIGH CONCENTRATION NO WITH INHALATION THERAPY GAS	17/151410	18-Jan-2021				Published	MALLINCKR ODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHODS FOR TREATING ACUTE WOUNDS AND IMPROVING OUTCOMES	17/763552	24-Mar-2022				Pending	STRATATEC H CORPORATION

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Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	DOSAGES OF L-ORNITHINE PHENYLACETATE FOR TREATING HYPERAMMONEMIA	17/767009	6-April-2022				Pending	OCERA THERAPEUTIC CS, INC.
United States of America	SYSTEMS AND METHODS FOR INDICATING LIFETIME OF AN NO2-TO-NO REACTOR CARTRIDGE USED TO DELIVER NO FOR INHALATION THERAPY TO A PATIENT	16/696142	26-Nov-2019	11324912	10-May-2022	16-Apr.2036	Granted	MALLINCKRODT PHARMACEUTICALS IRELAND LIMITED
United States of America	METHODS OF USING MACROCYCLIC AGONISTS OF THE GHRELIN RECEPTOR FOR TREATMENT OF GASTROINTESTINAL MOTILITY DISORDERS	11/774185	6-Jul-2007	8088733	3-Jan-2012	25-Mar-2030	Granted	OCERA THERAPEUTIC CS, INC.
United States of America	MACROCYCLIC GHRELIN RECEPTOR MODULATORS AND METHODS OF USING THE SAME	12/028611	8-Feb-2008	9371297	21-Jun-2016	3-Jul-2032	Granted	OCERA THERAPEUTIC CS, INC.

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	MACROCYCLIC ANTAGONISTS OF THE MOTILIN RECEPTOR FOR TREATMENT OF GASTROINTESTINAL DYSMOTILITY DISORDERS	12/440802	22-Dec-2009	9133235	15-Sep-2015	17-May-2030	Granted	OCERA THERAPEUTI CS, INC.
United States of America	LIPOSOMAL CISPLATIN FOR CANCER THERAPY	14/208297	13-Mar-2014	10039716	7-Aug-2018	1-Jan-2036	Granted	MALLINCKR ODT LLC
United States of America	MACROCYCLIC GHRELIN RECEPTOR MODULATORS AND METHODS OF USING THE SAME	15/178,303	9-Jun-2016	9949949	24-Apr-2018	8-Feb-2028	Granted	OCERA THERAPEUTI CS, INC.
United States of America	FIBRINOGEN PREPARATIONS ENRICHED IN FIBRINOGEN WITH AN EXTENDED ALPHA CHAIN	15/614157	5-Jun-2017	10004787	26-Jun-2018	7-Jan-2031	Granted	MALLINCKR ODT PHARMA IP TRADING UNLIMITED COMPANY
United States of America	COMBINATIONAL LIPOSOME COMPOSITIONS FOR CANCER THERAPY	15/663472	28-Jul-2017	10213385	26-Feb-2019	31-Oct-2032	Granted	MALLINCKR ODT LLC

Country	Invention Title	Appl. No.	Filing Date	Patent No.	Issue Date	Expiration Date	Status	Owner
United States of America	MACROCYCLIC GHRELIN RECEPTOR MODULATORS AND METHODS OF USING THE SAME	15/938,038	28-Mar-2018	10258602	16-Apr-2019	8-Feb-2028	Issued	OCERA THERAPEUTICS, INC.
United States of America	LIPOSOMAL CISPLATIN COMPOSITIONS FOR CANCER THERAPY	16/030575	9-Jul-2018	10383823	20-Aug-2019	13-Mar-2034	Granted	MALLINCKR ODT LLC

**PATENT**

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**RECORDED: 11/16/2023**