

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5519920

|                                                                                                                                                                                                 |                                             |                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------|
| <b>SUBMISSION TYPE:</b>                                                                                                                                                                         | NEW ASSIGNMENT                              |                       |
| <b>NATURE OF CONVEYANCE:</b>                                                                                                                                                                    | ASSIGNMENT                                  |                       |
| <b>CONVEYING PARTY DATA</b>                                                                                                                                                                     |                                             |                       |
|                                                                                                                                                                                                 | <b>Name</b>                                 | <b>Execution Date</b> |
|                                                                                                                                                                                                 | MERIAL, INC.                                | 01/29/2019            |
| <b>RECEIVING PARTY DATA</b>                                                                                                                                                                     |                                             |                       |
| <b>Name:</b>                                                                                                                                                                                    | BOEHRINGER INGELHEIM ANIMAL HEALTH USA INC. |                       |
| <b>Street Address:</b>                                                                                                                                                                          | 3239 SATELLITE BOULEVARD, BLDG.500          |                       |
| <b>City:</b>                                                                                                                                                                                    | DULUTH                                      |                       |
| <b>State/Country:</b>                                                                                                                                                                           | GEORGIA                                     |                       |
| <b>Postal Code:</b>                                                                                                                                                                             | 30096                                       |                       |
| <b>PROPERTY NUMBERS Total: 1</b>                                                                                                                                                                |                                             |                       |
|                                                                                                                                                                                                 | <b>Property Type</b>                        | <b>Number</b>         |
|                                                                                                                                                                                                 | Application Number:                         | 16392412              |
| <b>CORRESPONDENCE DATA</b>                                                                                                                                                                      |                                             |                       |
| <b>Fax Number:</b>                                                                                                                                                                              | (678)638-3350                               |                       |
| <i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i> |                                             |                       |
| <b>Email:</b>                                                                                                                                                                                   | assignment.ip@merial.com                    |                       |
| <b>Correspondent Name:</b>                                                                                                                                                                      | DR. JUDY JARECKI-BLACK, ESQ.                |                       |
| <b>Address Line 1:</b>                                                                                                                                                                          | 3239 SATELLITE BLVD.                        |                       |
| <b>Address Line 4:</b>                                                                                                                                                                          | DULUTH, GEORGIA 30096                       |                       |
| <b>ATTORNEY DOCKET NUMBER:</b>                                                                                                                                                                  | MER 15-284.1                                |                       |
| <b>NAME OF SUBMITTER:</b>                                                                                                                                                                       | JOAN DSOUZA                                 |                       |
| <b>SIGNATURE:</b>                                                                                                                                                                               | /JOAN DSOUZA/                               |                       |
| <b>DATE SIGNED:</b>                                                                                                                                                                             | 05/13/2019                                  |                       |
| <b>Total Attachments: 31</b>                                                                                                                                                                    |                                             |                       |
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## ASSIGNMENT AGREEMENT

This Assignment is made and entered into by and between

**MERIAL, INC.**

a Georgia corporation, having its principal place of business at 3239 Satellite Boulevard, Bldg. 500, Duluth, Georgia 30096 USA, on behalf of itself and any of its subsidiaries and/or Affiliates

hereinafter referred to as "Assignor"

and

**BOEHRINGER INGELHEIM ANIMAL HEALTH USA INC.**

a corporation organized and existing under the laws of the State of Delaware, successor-in-interest by merger to Merial, Inc., having its principal place of business at 3239 Satellite Boulevard, Bldg. 500, Duluth, Georgia 30096 USA

hereinafter referred to as "BI AH USA"

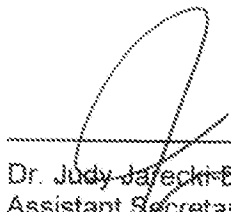
being the proprietor of certain improvements in the international application as indicated in the attached Schedule for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Assignor hereby assign unto BI AH USA, its successors and assigns (1) the entire right, title and interest in all countries throughout the world in and to any and all of the inventions and discoveries in the United States utility patent application and International Patent Application, filed under the Patent Cooperation Treaty in the United States Receiving Office (RO/US), designating all PCT member countries/states, as well as in any renewals, revivals, reissues, reexaminations, extensions, continuations and divisions thereof, and any substitute applications therefore; (2) the full and complete right to file patent applications in the name of BI AH USA, or their designee's election, on the aforesaid inventions, discoveries and applications in all countries of the world; (3) the entire right title and interest in and to any Letters Patent which may issue on the aforesaid inventions, discoveries and applications in any country of the world and any renewals, revivals, reissues, reexaminations and extensions thereof, and any patents of confirmation, registration and importation of the same; and (4) the entire right, title and interest in and to all Convention and Treaty Rights of all kinds thereon, including

without limitation all rights of priority in any country of the world, in and to the priority application(s).

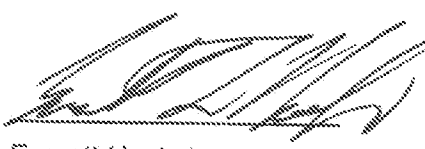
The Assignor declares that he is proprietor of the intellectual property rights, such as patents, patent applications, supplementary protection certificates, supplementary protection certificate applications, utility models or design patents, given in the schedule hereto, and hereby declares that he assigns the said intellectual property rights and all his rights, title and interest in and to the said intellectual property rights, to **BI AH USA**, together with all rights of action, power and benefit belonging or accrued arising therefrom including the right to take proceedings to recover damages and claim all other relief in respect of any acts of infringement thereof whether such acts shall have been committed before or after the date of this assignment. **BI AH USA** hereby declares that he accepts such assignment.

Assignor further agrees that the change of ownership be recorded in the official Patent Office records.

Date: January 29, 2019  
Merial Inc.

  
\_\_\_\_\_  
Dr. Judy Jarecki-Black, Esq.  
Assistant Secretary for Patents

Date: January 29, 2019  
Boehringer Ingelheim Animal  
Health USA Inc.

  
\_\_\_\_\_  
Everett Hoekstra  
President

Enclosure: Intellectual Property Rights - Schedule

## Intellectual Property Rights - Schedule

| Country Name             | Application Status | App Title                                                                                                            | App Number | Pat Number |
|--------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Granted            | "(S)-ENANTIOMER ENRICHED FIPRONIL COMPOSITION"                                                                       | 09/550312  | 6346542    |
| United States of America | Granted            | Selective Embryonic Structure Targeting and Substance Delivery Device                                                | 14517184   | 9686969    |
| United States of America | Granted            | Processes For Preparing Pesticidal Intermediates                                                                     | 10120479   | 6673956    |
| United States of America | Granted            | Processes For Preparing Pesticidal Intermediates                                                                     | 9673801    | 6392081    |
| United States of America | Granted            | Arylazol-2-YL Cyanoethylamide Compounds, Method of Making and Method of Using Thereof                                | 13622664   | 8822689    |
| United States of America | Granted            | Arylazol-2-YL Cyanoethylamide Compounds, Method of Making and Method of Using Thereof                                | 13325467   | 8283475    |
| United States of America | Granted            | Arylazol-2-YL Cyanoethylamide Compounds, Method of Making and Method of Using Thereof                                | 12119150   | 8088801    |
| United States of America | Granted            | NEW PROCESS FOR PREPARING PESTICIDAL INTERMEDIATES                                                                   | 10621344   | 6919462    |
| United States of America | Granted            | NEW PROCESS FOR PREPARING PESTICIDAL INTERMEDIATES                                                                   | 9890653    | 6620944    |
| United States of America | Granted            | PLANTING APPARATUS WITH IMPROVED LIQUID PESTICIDE DELIVERY DEVICE AND RELATED METHOD FOR DELIVERING LIQUID PESTICIDE | 9396332    | 6289829    |
| United States of America | Granted            | NEW PROCESS FOR PREPARING PESTICIDAL INTERMEDIATES                                                                   | 11129837   | 7087786    |
| United States of America | Granted            | Processes For Preparing Pesticidal Intermediates                                                                     | 10703417   | 7094906    |
| United States of America | Granted            | Processes for Preparing Pesticidal Intermediates                                                                     | 9937816    | 6410737    |
| United States of America | Granted            | PESTICIDAL BIS-ORGANOSULFUR COMPOUNDS                                                                                | 13511736   | 8846569    |
| United States of America | Published          | USE OF MALONONITRILE COMPOUNDS FOR PROTECTING ANIMALS FROM PARASITES                                                 | 15304018   |            |

## Intellectual Property Rights - Schedule

| Country Name             | Application Status | App Title                                                                                                       | App Number | Pat Number |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Granted            | 5-Substituted-Alkylaminopyrazole Derivatives as Pesticides                                                      | 10506356   | 7517877    |
| United States of America | Pending            | Modified Marek's Disease Virus, and Vaccines Made Therefrom                                                     | 16262774   |            |
| United States of America | Pending            | REDUCED FOAMING VACCINE COMPOSITIONS                                                                            | 16256463   |            |
| United States of America | Granted            | NEEDLE-FREE ADMINISTRATION OF PRRSV VACCINES                                                                    | 13479451   | 9669085    |
| United States of America | Granted            | RECOMBINANT FELINE LEUKEMIA VIRUS VACCINE CONTAINING OPTIMIZED FELINE LEUKEMIA VIRUS ENVELOPE GENE              | 14616042   | 9682138    |
| United States of America | Granted            | RECOMBINANT FELINE LEUKEMIA VIRUS VACCINE CONTAINING OPTIMIZED FELINE LEUKEMIA VIRUS ENVELOPE GENE              | 14507455   | 9856295    |
| United States of America | Granted            | RECOMBINANT FELINE LEUKEMIA VIRUS VACCINE CONTAINING OPTIMIZED FELINE LEUKEMIA VIRUS ENVELOPE GENE              | 13364993   | 8895027    |
| United States of America | Granted            | Novel Monensin Derivatives for the Treatment and Prevention of Protozoal Infections                             | 13297367   | 8822528    |
| United States of America | Published          | Vaccines Comprising A Tick Cement Protein                                                                       | 10/280114  |            |
| United States of America | Granted            | Methods of using Microneedle Vaccine Formulations to Elicit in Animals Protective Immunity against Rabies Virus | 14930831   | 10010499   |
| United States of America | Granted            | RECOMBINANT ADENOVIRUS VECTORED FMDV VACCINES AND USES THEREOF                                                  | 15419418   | 10188721   |
| United States of America | Pending            | RECOMBINANT ADENOVIRUS VECTORED FMDV VACCINES AND USES THEREOF                                                  | 16250654   |            |
| United States of America | Granted            | ANTIMICROBIAL POLYAMIDE COMPOSITIONS AND MASTITIS TREATMENT                                                     | 14204339   | 10131744   |

## Intellectual Property Rights - Schedule

| Country Name             | Application Status | App Title                                                                                                                                                                | App Number | Pat Number |
|--------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Published          | Multi-dose Compositions Containing an Antimicrobial Polyamide or Octenidine Preservative                                                                                 | 15487323   |            |
| United States of America | Published          | Recombinant AAV Vectors Expressing Osteoprotective genes, including HAS2 and Lubricin, useful in the Treatment of Osteoarthritis and Related Joint Conditions in Mammals | 15405992   |            |
| United States of America | Published          | Novel Methods for Freeze-drying and Rehydrating Biologics                                                                                                                | 15311093   |            |
| United States of America | Granted            | Immunogenic Polypeptide Isolate from Mycobacterium Avium Subspecies Paratuberculosis and Uses Thereof                                                                    | 12654214   | 9102743    |
| United States of America | Granted            | Immunogenic Polypeptide Isolate from Mycobacterium Avium Subspecies Paratuberculosis and Uses Thereof                                                                    | 10518432   | 7744905    |
| United States of America | Granted            | Method of maintaining oral health in animals Using Morpholine Derivatives                                                                                                | 15801109   | 10206928   |
| United States of America | Published          | Method of maintaining oral health in animals                                                                                                                             | 14700962   |            |
| United States of America | Granted            | DNA MOLECULES ENCODING LIGAND-GATED ION CHANNELS FROM DROSOPHILA MELANOGASTER                                                                                            | 10204029   | 7244586    |
| United States of America | Granted            | Compositions and Methods of Preventing or Reducing The Risk or Incidence of Skeletal Injuries in Horses                                                                  | 9902913    | 6638920    |
| United States of America | Granted            | Cyclic GMP Dependent Protein Kinase as a Chemotherapeutic Target for Antiprozoal Agents                                                                                  | 09/521,511 | 6,555,358  |
| United States of America | Granted            | Method for Inhibiting Dental Resorptive Lesions                                                                                                                          | 9436585    | 6331533    |
| United States of America | Granted            | Attenuated Gram Negative Bacteria                                                                                                                                        | 13091046   | 8329163    |
| United States of America | Granted            | Gene Therapy For Renal Failure                                                                                                                                           | 12273931   | 7772205    |

**Intellectual Property Rights - Schedule**

| <b>Country Name</b>      | <b>Application Status</b> | <b>App Title</b>                                                                                                                               | <b>App Number</b> | <b>Pat Number</b> |
|--------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|
| United States of America | Granted                   | Attenuated Gram Negative Bacteria                                                                                                              | 12246809          | 7943125           |
| United States of America | Granted                   | Heterocyclic Amide and Imine Derivatives, Processes for their Preparation, Compositions Compromising Them and Their Use as Pesticides          | 11756525          | 7629348           |
| United States of America | Granted                   | Process For the Preparation of Phenyl Pyrazole Compounds                                                                                       | 11529051          | 7323574           |
| United States of America | Granted                   | Pyridine Carboxamide Derivatives and Their Use As Pesticides                                                                                   | 10514485          | 7476685           |
| United States of America | Granted                   | Anthelmintic Oral Homogeneous Veterinary Pastes                                                                                                | 11107048          | 7563773           |
| United States of America | Granted                   | Heterocyclic Amide and Imine Derivatives, Processes for their Preparation, Compositions Compromising Them and Their Use as Pesticides          | 10 811578         | 7235571           |
| United States of America | Granted                   | Process For the Preparation of Phenyl Pyrazole Compounds                                                                                       | 10519823          | 7129372           |
| United States of America | Granted                   | Cotton rat lung cells for virus culture.                                                                                                       | 10391498          | 7906311           |
| United States of America | Granted                   | Cyclic GMP Dependent Protein Kinase as a Chemotherapeutic Target for Antiprozoal Agents                                                        | 10/348,155        | 7125700           |
| United States of America | Granted                   | Feline Calicivirus (FCV) Capside Gene and Recombinant Vaccine                                                                                  | 10/209507         | 6914134           |
| United States of America | Granted                   | Pesticidal 1-Arylpyrazoles                                                                                                                     | 10196959          | 6638956           |
| United States of America | Granted                   | Equine Herpes Virus Type1 Glycoprotein D (EHV-1gD)                                                                                             | 94440             | 6605465           |
| United States of America | Granted                   | Pesticidal 1-Arylpyrazoles                                                                                                                     | 9970667           | 6500850           |
| United States of America | Granted                   | Omeprazole Prevention of Ulcers                                                                                                                | 09/867285         | 6939881           |
| United States of America | Granted                   | Process which is useful for converting the Carbonyl function in position 4" of the Cladinose Unit of an Aza-Macrolide Into an Amine Derivative | 09/858671         | 6562953           |
| United States of America | Granted                   | Dermacentor Variabilis GABA Gated Chloride Channels                                                                                            | 10239956          | 7220832           |
| United States of America | Granted                   | Vacin circovirus et parvovirus porcin.                                                                                                         | 09/784962         | 6953581           |

## Intellectual Property Rights - Schedule

| Country Name             | Application Status | App Title                                                                                                             | App Number | Pat Number |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Granted            | Improved DNA Vaccines for Farm Animals, in particular Bovines and Porcines                                            | 09/760,574 | 7,078,388  |
| United States of America | Granted            | Process for Preparing and Isolating 9-Deoxo-9(2)-Hydroxyiminoerythromycine A                                          | 09/740671  | 6590084    |
| United States of America | Granted            | Equine Herpes Virus Type1 Glycoprotein D (EHV-1gD)                                                                    | 717577     | 6395283    |
| United States of America | Granted            | Pesticidal 1-Arylpyrazoles                                                                                            | 9714100    | 6395760    |
| United States of America | Granted            | Live Recombined Vaccines Injected with Adjuvant                                                                       | 622951/09  | 6713068    |
| United States of America | Granted            | Feline Calicivirus (FCV) Capside Gene and Recombinant Vaccine                                                         | 09 617594  | 6541458    |
| United States of America | Granted            | Equine Herpes Virus Type1 Glycoprotein D (EHV-1gD)                                                                    | 532906     | 6248333    |
| United States of America | Granted            | Poxvirus-canine distemper virus (CDV) or measles virus recombinants and compositions and methods employing the recomb | 354138     | 6309647    |
| United States of America | Granted            | Water Miscible Microlide Solutions                                                                                    | 9346905    | 6239112    |
| United States of America | Pending            | AVERMECTIN B1 DERIVATIVES HAVING AN AMINOSULFONYLOXY SUBSTITUENT IN THE 4"-POSITION                                   | 10/498858  |            |
| United States of America | Pending            | Compositions and Vaccines containing Antigen(s) Of Cryptosporidium Parvum and of another Pathogen                     | 09/733329  |            |
| United States of America | Published          | Modified Marek's Disease Virus, and Vaccines Made Therefrom                                                           | 13841684   |            |
| United States of America | Granted            | USE OF MORPHOLINO COMPOUNDS FOR THE PREVENTION OF BACTERIAL CONTAMINATION                                             | 11814925   | 8999365    |
| United States of America | Prosecution        | MORPHOLINO COMPOUND MICROEMULSION                                                                                     | 12742407   |            |
| United States of America | Granted            | Leishmania Vaccine Using Sand Fly Salivary Immunogen                                                                  | 12436398   | 8603808    |

## Intellectual Property Rights - Schedule

| Country Name             | Application Status | App Title                                                                                                              | App Number | Pat Number |
|--------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Granted            | AVERMECTIN B1 AND AVERMECTIN B1 MONOSACCHARIDE DERIVATIVES HAVING AN ALKOXYMETHYL SUBSTITUENT IN THE 4"-OR 4'-POSITION | 13117292   | 8263566    |
| United States of America | Granted            | RAPIDLY DISSOLVING VACCINE COMPOSITIONS                                                                                | 16125911   | 10213509   |
| United States of America | Granted            | ATTENUATED MANNHEIMIA HAEMOLYTICA VACCINES AND METHODS OF MAKING AND USE                                               | 15594451   | 10058601   |
| United States of America | Granted            | Apparatus and methods for labeling vials or ampoules stored at temperatures as low as -200 °C                          | 15498933   | 10071582   |
| United States of America | Granted            | Recombinant Poxviral Vectors Expressing both Rabies and OX40 Proteins, and Vaccines Made Therefrom                     | 15410588   | 10006050   |
| United States of America | Granted            | ANTHELMINTIC COMPOUNDS                                                                                                 | 15311848   | 10045979   |
| United States of America | Granted            | FMDV and E2 Fusion Proteins and Uses Thereof                                                                           | 15353727   | 9913891    |
| United States of America | Granted            | PARASITICIDAL COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENT, METHODS AND USES THEREOF                               | 15286133   | 10201529   |
| United States of America | Granted            | Canine Parvovirus (CPV) Virus-like Particle (VLP) Vaccines and uses thereof                                            | 15265545   | 10080798   |
| United States of America | Granted            | Topical Compositions Comprising Fipronil and Permethrin and Methods of Use                                             | 15248327   | 9949953    |
| United States of America | Granted            | ANTIPARISITIC DIHYDROAZOLE COMPOUNDS AND COMPOSITIONS COMPRISING SAME                                                  | 15191163   | 9776999    |
| United States of America | Granted            | PRRSV minor protein-containing recombinant viral vectors and methods of making and use thereof                         | 15190740   | 9981033    |

## Intellectual Property Rights - Schedule

| Country Name             | Application Status | App Title                                                                                                                               | App Number | Pat Number |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Granted            | ANTHELMINTIC DEPSIPEPTIDE COMPOUNDS                                                                                                     | 15160577   | 10081656   |
| United States of America | Granted            | METHOD FOR PORCINE CIRCOVIRUS PRODUCTION                                                                                                | 15154028   | 9944904    |
| United States of America | Granted            | PARASITICIDAL COMPOSITIONS COMPRISING BENZIMIDAZOLE DERIVATIVES, METHODS AND USES THEREOF                                               | 15148168   | 9695129    |
| United States of America | Granted            | Recombinant CDV Compositions and uses thereof                                                                                           | 15084108   | 10076566   |
| United States of America | Granted            | ATTENUATED MANNHEIMIA HAEMOLYTICA VACCINES AND METHODS OF MAKING AND USE                                                                | 14991003   | 9675682    |
| United States of America | Granted            | ANTHELMINTIC COMPOUNDS AND COMPOSITIONS AND METHOD OF USING THEREOF                                                                     | 14981847   | 10155725   |
| United States of America | Granted            | PARASITICIDAL ORAL VETERINARY COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENTS, METHODS AND USES THEREOF                               | 14977680   | 9931320    |
| United States of America | Granted            | ATTENUATED SWINE INFLUENZA VACCINES AND METHODS OF MAKING AND USE THEREOF                                                               | 14977485   | 9623105    |
| United States of America | Granted            | PARASITICIDAL COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENT, METHODS AND USES THEREOF                                                | 14930690   | 9877950    |
| United States of America | Granted            | REDUCED FOAMING VACCINE COMPOSITIONS                                                                                                    | 14880145   | 10188734   |
| United States of America | Granted            | Dissolution of hydrophobic API, including avermectins with or without other API such as pyrantel, from a complicated matrix dosage form | 14872639   | 10073072   |

## Intellectual Property Rights - Schedule

| Country Name             | Application Status | App Title                                                                                                         | App Number | Pat Number |
|--------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Granted            | Parasitocidal Compositions Comprising Multiple Active Agents, Methods and Uses Thereof                            | 14868927   | 9770449    |
| United States of America | Granted            | FMDV RECOMBINANT VACCINES AND USES THEREOF                                                                        | 14863181   | 10010605   |
| United States of America | Granted            | Novel Cryopreservation Bags and method of use thereof for Closed System, High Capacity Cell-Banking               | 14826720   | 9879217    |
| United States of America | Granted            | RECOMBINANT HVT VECTORS EXPRESSING ANTIGENS OF AVIAN PATHOGENS AND USES THEREOF                                   | 14747419   | 9555096    |
| United States of America | Granted            | PARASITICIDAL COMPOSITIONS COMPRISING INDOLE DERIVATIVES, METHODS AND USES THEREOF                                | 14744166   | 9776986    |
| United States of America | Granted            | Recombinant Spike Protein Subunit Based Vaccine for Porcine Epidemic Diarrhea Virus (PEDV)                        | 14716481   | 9713639    |
| United States of America | Granted            | Her2 DNA Vaccine as Adjunct Treatment for Cancers in Companion Animals                                            | 14699296   | 9901628    |
| United States of America | Granted            | RECOMBINANT GALLID HERPESVIRUS 3 (MDV SEROTYPE 2) VECTORS EXPRESSING ANTIGENS OF AVIAN PATHOGENS AND USES THEREOF | 14682798   | 9770502    |
| United States of America | Granted            | Immunological Compositions Containing Attenuated Histophilus somni                                                | 15419568   | 10098941   |
| United States of America | Granted            | Immunological Compositions Containing Attenuated Histophilus somni                                                | 14668656   | 9592283    |

## Intellectual Property Rights - Schedule

| Country Name             | Application Status | App Title                                                                                                 | App Number | Pat Number |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Granted            | ANTIPARISITIC DIHYDROAZOLE COMPOUNDS AND COMPOSITIONS COMPRISING SAME                                     | 14658668   | 9376434    |
| United States of America | Granted            | ATTENUATED PARVOVIRUS VACCINE FOR MUSCOVY DUCK PARVOVIRUS AND GOOSE PARVOVIRUS (DERZSY DISEASE)           | 15378147   | 9913896    |
| United States of America | Granted            | ATTENUATED PARVOVIRUS VACCINE FOR MUSCOVY DUCK PARVOVIRUS AND GOOSE PARVOVIRUS (DERZSY DISEASE)           | 14427197   | 9555098    |
| United States of America | Granted            | VACCINE FORMULATIONS COMPRISING SAPONIN-CONTAINING ADJUVANTS                                              | 14632863   | 9730987    |
| United States of America | Granted            | PARASITICIDAL ORAL VETERINARY COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENTS, METHODS AND USES THEREOF | 14627499   | 9259417    |
| United States of America | Granted            | PARASITICIDAL COMPOSITIONS COMPRISING BENZIMIDAZOLE DERIVATIVES, METHODS AND USES THEREOF                 | 14627595   | 9359305    |
| United States of America | Granted            | NEWCASTLE DISEASE VIRUS VECTORED HERPESVIRUS VACCINES                                                     | 14616011   | 9446118    |
| United States of America | Granted            | TOPICAL DELIVERY FORMULATION                                                                              | 14600651   | 9756852    |
| United States of America | Granted            | RECOMBINANT EQUINE HERPESVIRUS-1 VACCINE CONTAINING MUTATED GLYCOPROTEIN C AND USES THEREOF               | 14543300   | 9555101    |
| United States of America | Granted            | IMPROVED PROCESSES FOR THE PREPARATION OF 1-ARYL-5-ALKYL PYRAZOLE COMPOUNDS                               | 14543341   | 9273007    |

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| Country Name             | Application Status | App Title                                                                                      | App Number | Pat Number |
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| United States of America | Granted            | Attenuated Pasteurella Multocida Vaccines & Methods of Making & Use Thereof.                   | 14528305   | 9757445    |
| United States of America | Granted            | ANTIPARISITIC AND PESTICIDAL ISOXAZOLINE COMPOUNDS                                             | 14528172   | 9447084    |
| United States of America | Granted            | HAEMOPHILUS PARASUIS VACCINE SEROVAR TYPE FOUR                                                 | 14507397   | 9504740    |
| United States of America | Granted            | COMPOSITIONS COMPRISING AN ARYL PYRAZOLE AND A SUBSTITUTED IMIDAZOLE, METHODS AND USES THEREOF | 14493562   | 9125407    |
| United States of America | Granted            | Multi-chamber, Multi-formulation Fluid Delivery System                                         | 14488968   | 9706754    |
| United States of America | Granted            | 1-Aryl-5-Alkyl Pyrazole Derivative Compounds, Processes of Making and Methods of Using Thereof | 14325761   | 9339033    |
| United States of America | Granted            | Sustained Release Capsules                                                                     | 14274282   | 9555225    |
| United States of America | Granted            | NEWCASTLE DISEASE VIRUS VECTORED AVIAN VACCINES                                                | 14268302   | 9616118    |
| United States of America | Granted            | LONG-ACTING INJECTABLE MOXIDECTIN FORMULATIONS AND NOVEL MOXIDECTIN CRYSTAL FORMS              | 14225187   | 9044453    |
| United States of America | Granted            | Reverse genetics Schmallenberg virus vaccine compositions, and methods of use thereof          | 14204248   | 9556419    |
| United States of America | Granted            | METHOD FOR TREATING AND CURING LEISHMANIOSIS USING FEXINIDAZOLE                                | 14169713   | 9585871    |
| United States of America | Granted            | ANTIPARISITIC DIHYDROAZOLE COMPOUNDS AND COMPOSITIONS COMPRISING SAME                          | 14086712   | 8980893    |
| United States of America | Granted            | ANTHELMINTIC COMPOUNDS AND COMPOSITIONS AND METHOD OF USING THEREOF                            | 14083879   | 9249102    |

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| Country Name             | Application Status | App Title                                                                                                            | App Number | Pat Number |
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| United States of America | Granted            | ATTENUATED MANNHEIMIA HAEMOLYTICA VACCINES AND METHODS OF MAKING AND USE                                             | 14075169   | 9370561    |
| United States of America | Granted            | EXPRESSION OF CHIMERIC KSAC PROTEIN AND METHOD OF PRODUCING SOLUBLE PROTEIN BY HIGH PRESSURE                         | 14014437   | 9315553    |
| United States of America | Granted            | Hyperbaric Device and Methods for Producing Inactivated Vaccines and for Refolding/Solubilizing Recombinant Proteins | 14014434   | 9169302    |
| United States of America | Granted            | METHOD OF PROVIDING PROTECTIVE IMMUNITY AGAINST HETEROLOGOUS LEPTOSPIRA STRAINS                                      | 13939300   | 9050282    |
| United States of America | Granted            | ATTENUATED SWINE INFLUENZA VACCINES AND METHODS OF MAKING AND USE THEREOF                                            | 13939321   | 9216211    |
| United States of America | Granted            | ATTENUATED STREPTOCOCCUS SUI VACCINES AND METHODS OF MAKING AND USE THEREOF                                          | 13924871   | 9289484    |
| United States of America | Granted            | COMPOSITIONS COMPRISING AN ARYLPYRAZOLE AND/OR A FORMAMIDINE METHODS AND USES THEREOF                                | 13901077   | 8921408    |
| United States of America | Granted            | 1-Aryl-5-Alkyl Pyrazole Derivative Compounds, Processes of Making and Methods of Using Thereof                       | 13894601   | 8785372    |
| United States of America | Granted            | IMPROVED PROCESSES FOR THE PREPARATION OF 1-ARYL-5-ALKYL PYRAZOLE COMPOUNDS                                          | 13867699   | 8937185    |
| United States of America | Granted            | PARASITICIDAL COMPOSITIONS COMPRISING BENZIMIDAZOLE DERIVATIVES, METHODS AND USES THEREOF                            | 13865802   | 9000187    |

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| Country Name             | Application Status | App Title                                                                                                         | App Number | Pat Number |
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| United States of America | Granted            | RECOMBINANT EQUINE HERPESVIRUS-1 VACCINE CONTAINING MUTATED GLYCOPROTEIN C AND USES THEREOF                       | 13840935   | 8916371    |
| United States of America | Granted            | Topical Compositions Comprising Fipronil and Permethrin and Methods of Use                                        | 13774159   | 9457088    |
| United States of America | Granted            | Recombinant Poxviral Vectors Expressing both Rabies and OX40 Proteins, and Vaccines Made Therefrom                | 13767603   | 9567606    |
| United States of America | Granted            | Rotavirus Subunit Vaccines and Methods of Making and Use Thereof                                                  | 13767569   | 9446117    |
| United States of America | Granted            | COMPOSITIONS COMPRISING AN ARYLPYRAZOLE AND/OR A FORMAMIDINE METHODS AND USES THEREOF                             | 13765542   | 9173728    |
| United States of America | Granted            | PARASITICIDAL ORAL VETERINARY COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENTS, METHODS AND USES THEREOF         | 13754969   | 9233100    |
| United States of America | Granted            | Long-acting nanoencapsulated arthropod repellent formulations and methods of use thereof                          | 13751787   | 8999362    |
| United States of America | Granted            | LONG-ACTING INJECTABLE MOXIDECTIN FORMULATIONS AND NOVEL MOXIDECTIN CRYSTAL FORMS                                 | 13690185   | 8715711    |
| United States of America | Granted            | RECOMBINANT GALLID HERPESVIRUS 3 (MDV SEROTYPE 2) VECTORS EXPRESSING ANTIGENS OF AVIAN PATHOGENS AND USES THEREOF | 13689572   | 9101598    |

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| Country Name             | Application Status | App Title                                                                                      | App Number | Pat Number |
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| United States of America | Granted            | RECOMBINANT HVT VECTORS EXPRESSING ANTIGENS OF AVIAN PATHOGENS AND USES THEREOF                | 13689625   | 9114108    |
| United States of America | Granted            | COMPOSITIONS COMPRISING AN ARYL PYRAZOLE AND A SUBSTITUTED IMIDAZOLE, METHODS AND USES THEREOF | 14358309   | 9173404    |
| United States of America | Granted            | PARASITICIDAL COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENT, METHODS AND USES THEREOF       | 13611025   | 9180121    |
| United States of America | Granted            | Topical Formulations Comprising A 1-N Arylpyrazol Derivative and A Formamidine                 | 13555546   | 9066515    |
| United States of America | Granted            | AMIDO-PYRIDYL ETHER COMPOUNDS AND COMPOSITIONS AND THEIR USE AGAINST PARASITES                 | 14127248   | 8946270    |
| United States of America | Granted            | METHOD FOR VACUUM-ASSISTED PRESERVATION OF BIOLOGICS INCLUDING VACCINES                        | 13485437   | 10166188   |
| United States of America | Granted            | Insecticidal 4-amino-thieno[2,3-d]-pyrimidine compounds and methods of their use               | 13386194   | 9133209    |
| United States of America | Granted            | ANIMAL MEDICINE REMINDER TAG                                                                   | 13420217   | 8982672    |
| United States of America | Granted            | Leishmania Challenge Model                                                                     | 13296675   | 8414882    |
| United States of America | Granted            | Her2 DNA Vaccine as Adjunct Treatment for Cancers in Companion Animals                         | 13272651   | 9040053B2  |
| United States of America | Granted            | NEWCASTLE DISEASE VIRUS VECTORED HERPESVIRUS VACCINES                                          | 13220196   | 8986706    |
| United States of America | Granted            | DIMERIC 1-ARYLPYRAZOLE DERIVATIVES                                                             | 13129031   | 8642636    |

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| Country Name             | Application Status | App Title                                                                                      | App Number | Pat Number |
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| United States of America | Granted            | Parasitocidal Compositions Comprising Multiple Active Agents, Methods and Uses Thereof         | 13078496   | 9173403    |
| United States of America | Granted            | BLUETONGUE VIRUS RECOMBINANT VACCINES AND USES THEREOF                                         | 13046317   | 9345759    |
| United States of America | Granted            | Recombinant CDV Compositions and uses thereof                                                  | 13035904   | 9327137    |
| United States of America | Granted            | ANTIPARISITIC DIHYDROAZOLE COMPOUNDS AND COMPOSITIONS COMPRISING SAME                          | 12970670   | 8618126    |
| United States of America | Granted            | COMPOSITIONS COMPRISING MACROCYCLIC LACTONE COMPOUNDS AND SPIRODIOXEPINOINDOLES                | 12970684   | 8980896    |
| United States of America | Granted            | FLUORINATED OXA OR THIA HETEROARYLALKYLSULFIDE DERIVATIVES FOR COMBATING INVERTEBRATE PESTS    | 13510197   | 9023874    |
| United States of America | Granted            | VACCINE FORMULATIONS COMPRISING SAPONIN-CONTAINING ADJUVANTS                                   | 12878630   | 9107859    |
| United States of America | Granted            | Energy Absorbing Container                                                                     | 12849611   | 9169042    |
| United States of America | Granted            | Nipah Virus Vaccine                                                                            | 12839556   | 8420389    |
| United States of America | Granted            | Canine Leishmania Vaccine                                                                      | 12839580   | 8871225    |
| United States of America | Granted            | Sustained Release Capsules                                                                     | 13386202   | 8734430    |
| United States of America | Granted            | 1-Aryl-5-Alkyl Pyrazole Derivative Compounds, Processes of Making and Methods of Using Thereof | 12814289   | 8445519    |
| United States of America | Granted            | Intra-Vascular Kidney Gene Therapy with Plasmid Encoding BMP-7                                 | 12794184   | 8097599    |
| United States of America | Granted            | ANTIBIOTIC-FREE PLASMID                                                                        | 12786186   | 9217153    |
| United States of America | Granted            | MACROCYCLIC LACTONE COMBINATION COMPOSITIONS, VACCINES AND METHODS FOR PRODUCING SAME          | 12759176   | 8313752    |

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| Country Name             | Application Status | App Title                                                                                                             | App Number | Pat Number |
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| United States of America | Granted            | NEWCASTLE DISEASE VIRUS VECTORED AVIAN VACCINES                                                                       | 12753597   | 8871220    |
| United States of America | Granted            | DNA Molecules Encoding Ligand Gated Ion Channels from Dermacentor Variabiles                                          | 12684705   | 8163877    |
| United States of America | Granted            | Anthelmintic Composition                                                                                              | 12632569   | 8067382    |
| United States of America | Granted            | DIMERIC AVERMECTIN AND MILBEMYCIN DERIVATIVES                                                                         | 12631249   | 8426460    |
| United States of America | Granted            | Recombinant Avian Influenza Vaccine                                                                                   | 12628085   | 8394384    |
| United States of America | Granted            | ENANTIOMERICALLY ENRICHED ARYLOAZOL-2-YL CYANOETHYLAMINO COMPOUNDS, METHOD OF MAKING AND METHOD OF USING THEREOF      | 12618308   | 8461176    |
| United States of America | Granted            | COMPOSITIONS COMPRISING AN ARYLPYRAZOLE AND/OR A FORMAMIDINE METHODS AND USES THEREOF                                 | 12618534   | 8450357    |
| United States of America | Granted            | Method of Synthesizing Macrolide Compounds                                                                            | 12604618   | 8314218    |
| United States of America | Granted            | Vaccine Against African Horse Sickness Virus                                                                          | 12604048   | 8168200    |
| United States of America | Granted            | METHYLTHIOAMIDE AMIDO AND ARYLAZOL-2-YL-METHYLTHIOAMIDE AMIDO COMPOUNDS, METHOD OF MAKING AND METHOD OF USING THEREOF | 12582486   | 7964621    |
| United States of America | Granted            | THIOAMIDE AMIDO COMPOUNDS, METHOD OF MAKING AND METHOD OF USING THEREOF                                               | 13086161   | 8314146    |
| United States of America | Granted            | ECTOPARASITE DIAGNOSTIC APPARATUS AND METHOD OF USE THEREOF                                                           | 12485254   | 7980200    |
| United States of America | Granted            | PESTICIDAL N-PHENYLPYRAZOLE DERIVATIVES                                                                               | 12409252   | 8124642    |
| United States of America | Granted            | Solvent Systems For Pour-On Formulations For Combating Parasites                                                      | 12324066   | 8097266    |

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| Country Name             | Application Status | App Title                                                                                      | App Number | Pat Number |
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| United States of America | Granted            | MALONONITRILE COMPOUNDS                                                                        | 12158507   | 8916592    |
| United States of America | Granted            | Adjustable Animal Watering System                                                              | 12113483   | 8196549    |
| United States of America | Granted            | Assay for Porcine Circovirus Production                                                        | 12101512   | 7476507    |
| United States of America | Granted            | Multiple Fluid Delivery Device For Poultry                                                     | 11959400   | 7850665    |
| United States of America | Granted            | Salmonella Vaccine                                                                             | 11953472   | 8062645    |
| United States of America | Granted            | Canine Leishmania Vaccine                                                                      | 11942457   | 7794736    |
| United States of America | Granted            | Dispersion Devices For Aggregates                                                              | 11870059   | 7658341    |
| United States of America | Granted            | DNA Molecules Encoding Ligand Gated Ion Channels from Dermacentor Variables                    | 11840519   | 7645867    |
| United States of America | Granted            | DNA Molecules Encoding Ligand Gated Ion Channels from Dermacentor Variables                    | 11840542   | 7655440    |
| United States of America | Granted            | 1-Aryl-5-Alkyl Pyrazole Derivative Compounds, Processes of Making and Methods of Using Thereof | 11825050   | 7759381    |
| United States of America | Granted            | 1-Arylpyrazoles and their use as pesticide                                                     | 11764255   | 8097732    |
| United States of America | Granted            | 5-Aminopyrazole derivatives as pesticidal compounds                                            | 11759386   | 7834003    |
| United States of America | Granted            | INSECTICIDAL METHODS USING 4-AMINO-5-CHLORO-THIENO [2,3-D]-PYRIMIDINE COMPOUNDS                | 12301511   | 8242123    |
| United States of America | Granted            | Vaccine Against Streptococci                                                                   | 11692968   | 7455844    |
| United States of America | Granted            | DNA Molecules Encoding L-Glutamate-Gated Chloride Channels from Rhipicephalus sanguineus       | 11620347   | 7541432    |
| United States of America | Granted            | DNA Molecules Encoding L-Glutamate-Gated Chloride Channels from Rhipicephalus sanguineus       | 11620390   | 7674586    |
| United States of America | Granted            | DNA Molecules Encoding L-Glutamate-Gated Chloride Channels from Rhipicephalus sanguineus       | 11620435   | 7915010    |
| United States of America | Granted            | Gene Therapy For Renal Failure                                                                 | 11599026   | 7598364    |

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| Country Name             | Application Status | App Title                                                                            | App Number | Pat Number |
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| United States of America | Granted            | EGG VACCINATION APPARATUS                                                            | 11584775   | 7721674    |
| United States of America | Granted            | Control of Arthropods in Animals                                                     | 11529778   | 7468381    |
| United States of America | Granted            | STABILIZERS FOR FREEZE-DRIED VACCINES                                                | 11522211   | 8784843    |
| United States of America | Granted            | Vesicular Stomatitis Virus                                                           | 11505064   | 8008268    |
| United States of America | Granted            | Pesticidal Compositions                                                              | 10537460   | 7504362    |
| United States of America | Granted            | Leptospirosis Culture Process                                                        | 11404690   | 8642316    |
| United States of America | Granted            | Nipah Virus Vaccine                                                                  | 11404534   | 7803612    |
| United States of America | Granted            | Assay for Porcine Circovirus Production                                              | 11/403,497 | 7358075    |
| United States of America | Granted            | AVERMECTIN B1 MONOSACCHARIDE DERIVATIVES                                             | 10560390   | 7521429    |
| United States of America | Granted            | 6-HALOGENO-[1,2,4]TRIAZOLO[1,5-A]PYRIMIDINES FOR COMBATING ANIMAL PESTS              | 10570854   | 8664235    |
| United States of America | Granted            | Chemical Compounds, Process for their preparation and the use thereof                | 11780823   | 7700639    |
| United States of America | Granted            | Mixing Devices for Chemical Lysis of Cells                                           | 11287906   | 7829323    |
| United States of America | Granted            | Antiprotozoal Imidazopyridine Compounds                                              | 10548154   | 7504501    |
| United States of America | Granted            | Canine Influenza Vaccines                                                            | 11/211,983 | 7384642    |
| United States of America | Granted            | 1-ARYLPYRAZOLE DERIVATIVES PESTICIDAL AGENTS                                         | 11615647   | 7625842    |
| United States of America | Granted            | AUTOMATIC EGG VACCINATOR                                                             | 11152613   | 7430987    |
| United States of America | Granted            | Needle-free Administration of FELV Vaccines                                          | 11/146,299 | 7582302    |
| United States of America | Granted            | Avipox Recombinants Expressing Foot and Mouth Disease Virus (FMDV) Genes             | 11110480   | 7527960    |
| United States of America | Granted            | Methods and Apparatus for Automatic Jet Injection of Bird Eggs                       | 11096639   | 7261053    |
| United States of America | Granted            | SALTS OF AVERMECTINS SUBSTITUTED IN THE 4"-POSITION AND HAVING PESTICIDAL PROPERTIES | 11319687   | 7678773    |

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| Country Name             | Application Status | App Title                                                                                                              | App Number | Pat Number |
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| United States of America | Granted            | AVERMECTINS SUBSTITUTED IN THE 4"-POSITION HAVING PESTICIDAL PROPERTIES                                                | 11319686   | 7732416    |
| United States of America | Granted            | 1"Phenyl and 1-Pyridylpyrazole Derivatives and Their Use as Pesticides                                                 | 10592519   | 7872038    |
| United States of America | Granted            | Chimeric Vectors                                                                                                       | 10958267   | 7998733    |
| United States of America | Granted            | AVERMECTIN AND AVERMECTIN MONOSCCHARIDES SUBSTITUTED IN THE 4'-AND 4"-POSITION HAVING PESTICIDAL PROPERTIES            | 10568715   | 7704961    |
| United States of America | Granted            | New Vaccine Formulations                                                                                               | 10899181   | 7371395    |
| United States of America | Granted            | Canine GHRH Gene, Polypeptides and Methods of Use                                                                      | 10838122   | 7351815    |
| United States of America | Granted            | Topical Anthelmintic Veterinary Formulations                                                                           | 10/818,313 | 6991801    |
| United States of America | Granted            | Topical Formulations Comprising A 1-N Arylpyrazol Derivative and A Formamidine                                         | 12420325   | 8242161    |
| United States of America | Granted            | Topical Formulation Comprising 1-N-Arylpyrazole Derivatives and Amitraz                                                | 10/783,459 | 7531186    |
| United States of America | Granted            | AVERMECTINS SUBSTITUTED IN THE 4" AND 4'-POSITIONS HAVING PESTICIDAL PROPERTIES                                        | 10/544274  | 7378399    |
| United States of America | Granted            | AVERMECTIN-AND AVERMECTIN MONOSACCHARIDE DERIVATIVES SUBSTITUTED IN THE 4"-OR 4'-POSITION HAVING PESTICIDAL PROPERTIES | 10543638   | 7632820    |
| United States of America | Granted            | Pesticidal 5-(ACYLAMINO) Pyrazole Derivatives                                                                          | 10537547   | 7514561    |
| United States of America | Granted            | Process For The Preparation of Pesticidal Compounds                                                                    | 10297676   | 7199246    |
| United States of America | Granted            | Controls of Arthropods in Animals                                                                                      | 10/612,269 | 7067548    |
| United States of America | Granted            | 4"-DEOXY-4"-(S)-AMIDO AVERMECTIN DERIVATIVES                                                                           | 10/513247  | 7608595    |

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| Country Name             | Application Status | App Title                                                                                                                                    | App Number | Pat Number |
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| United States of America | Granted            | Process for the preparation of pesticidal compounds                                                                                          | 10297675   | 6812347    |
| United States of America | Granted            | Control of Arthropods in Animals                                                                                                             | 10 406491  | 6992099    |
| United States of America | Granted            | 5-Substituted-Alkylaminopyrazole Derivatives As Pesticides"                                                                                  | 10506358   | 7576107    |
| United States of America | Granted            | Vaccine Spray System                                                                                                                         | 10/350,557 | 6910446    |
| United States of America | Granted            | Cyclic GMP Dependent Protein Kinase as a Chemotherapeutic Target for Antiprozoal Agents                                                      | 11525062   | 7718390    |
| United States of America | Granted            | Controls of Arthropods in Animals                                                                                                            | 10/342,203 | 6630499    |
| United States of America | Granted            | Pesticidal 1-Ayl-3-Amidoxime-Pyrazole Derivatives                                                                                            | 10537466   | 7514428    |
| United States of America | Granted            | DNA Encoding Novel Cyclic GMP Dependent Protein Kinase From Two Protozoal Sources For Use as Chemotherapeutic Targets for Antiprozoal Agents | 10/499,554 | 7390892    |
| United States of America | Granted            | Automatic Poultry Injection Delivery Apparatus                                                                                               | 10295635   | 6789467    |
| United States of America | Granted            | Dihalopropene Compounds, Processes for Their Preparation, Compositions Comprising Them and Their Use As Pesticides                           | 10289398   | 6949551    |
| United States of America | Granted            | DNA Molecules Encoding Ligand Gated Ion Channels from Dermacentor Variables                                                                  | 10/239,420 | 7267964    |
| United States of America | Granted            | Tissue Cement Proteins From Rhipicephalus Appendiculatus                                                                                     | 10226489   | 7335733    |
| United States of America | Granted            | Substituted Propargylamines                                                                                                                  | 10/225,354 | 7084158    |
| United States of America | Granted            | 4"-DEOXY-4"(S) AMINO AVERMECTIN DERIVATIVES                                                                                                  | 10488225   | 7605134    |
| United States of America | Granted            | Polymorphic B Form of 3-(cyclopropylmethoxy)-4-(4-(methylsulfonyl)phenyl)-5,5 dimethyl-5H-furan-2-one                                        | 10117854   | 6677373    |
| United States of America | Granted            | Arylisoxazoline Derivatives, Processes for their Preparation and their use as Pesticides                                                     | 10102789   | 6645984    |
| United States of America | Granted            | Anthelmintic Composition                                                                                                                     | 9958814    | 7638545    |
| United States of America | Granted            | Bird vaccinating device and method of operation                                                                                              | 10/035341  | 6609479    |

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| Country Name             | Application Status | App Title                                                                                   | App Number | Pat Number |
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| United States of America | Granted            | Pesticidal Compounds and Compositions                                                       | 09/796,651 | 6458744    |
| United States of America | Granted            | Genesis Prazoquantel Solution                                                               | 9214543    | 6165987    |
| United States of America | Granted            | PESTICIDAL 1-ARYLPYRAZOLES                                                                  | 9578859    | 6403628    |
| United States of America | Granted            | Improved Paste Formulations                                                                 | 09/504741  | 6787342    |
| United States of America | Granted            | Controls of Arthropods in Animals                                                           | 09/457,869 | 6160002    |
| United States of America | Granted            | Aromatic Amides, Their Preparation Process and Their Use as Pesticides                      | 9402704    | 6555709    |
| United States of America | Granted            | EMULSIFIABLE CONCENTRATE COMPRISING AN INSECTICIDAL 1-ARYLPYRAZOLE                          | 9365183    | 6090751    |
| United States of America | Granted            | Insecticidal Methods                                                                        | 9352358    | 6313157    |
| United States of America | Granted            | PESTICIDAL 1-ARYLPYRAZOLES                                                                  | 9339175    | 6087387    |
| United States of America | Granted            | Process and Composition for the Antiparasitic Treatment of the Surrounding of Animals       | 9230282    | 6524603    |
| United States of America | Pending            | PARASITICIDAL COMPOSITIONS COMPRISING AN ISOXAZOLINE ACTIVE AGENT, METHODS AND USES THEREOF | 16247359   |            |
| United States of America | Pending            | NOVEL METHOD FOR VACUUM-ASSISTED PRESERVATION OF BIOLOGICS INCLUDING VACCINES               | 16182868   |            |
| United States of America | Pending            | PROCESS FOR THE PREPARATION OF ISOXAZOLINE COMPOUNDS                                        | 16182838   |            |
| United States of America | Pending            | Streptococcus vaccines and uses thereof                                                     | 16118857   |            |
| United States of America | Pending            | ANTHELMINTIC DEPSIPEPTIDE COMPOUNDS                                                         | 16111027   |            |

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| Country Name             | Application Status | App Title                                                                                                 | App Number | Pat Number |
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| United States of America | Pending            | PARASITICIDAL ORAL VETERINARY COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENTS, METHODS AND USES THEREOF | 15936778   |            |
| United States of America | Prosecution        | Cartridge Dispensing Devices and Cartridges For Use Therewith                                             | 15440951   |            |
| United States of America | Granted            | Cartridge Dispensing Devices and Cartridges For Use Therewith                                             | 12921807   | 8945070    |
| United States of America | Granted            | New Vaccine Formulations                                                                                  | 12027776   | 7608279    |
| United States of America | Granted            | Pesticidal 5-Substituted-Oxyalkylamino-a-Arylpyrazole Derivatives                                         | 10570042   | 7879897    |
| United States of America | Granted            | Stablized formulation of ivermectin feed premix                                                           | 10790489   | 7671034    |
| United States of America | Published          | Canine Parvovirus (CPV) Virus-like Particle (VLP) Vaccines and uses thereof                               | 16109570   |            |
| United States of America | Published          | ANTHELMINTIC COMPOUNDS                                                                                    | 16054101   |            |
| United States of America | Published          | Dual Active Parasitocidal Granule Compositions, Methods and Uses Thereof                                  | 16017880   |            |
| United States of America | Published          | Veterinary Formulations                                                                                   | 15777886   |            |
| United States of America | Published          | PRRSV minor protein-containing recombinant viral vectors and methods of making and use thereof            | 15961635   |            |
| United States of America | Published          | CRYSTALLINE FORMS OF (S)-AFOXOLANER                                                                       | 15946642   |            |
| United States of America | Published          | Topical Compositions Comprising Fipronil and Permethrin and Methods of Use                                | 15937878   |            |
| United States of America | Published          | METHOD FOR PORCINE CIRCOVIRUS PRODUCTION AND PCV2 VACCINES                                                | 15914420   |            |
| United States of America | Published          | PARASITICIDAL ORAL VETERINARY COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENTS, METHODS AND USES THEREOF | 15904798   |            |

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| Country Name             | Application Status | App Title                                                                                           | App Number | Pat Number |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Published          | FCV RECOMBINANT VACCINES AND USES THEREOF                                                           | 15753324   |            |
| United States of America | Published          | Liquid Applicator for Delivering Vaccines                                                           | 15895876   |            |
| United States of America | Published          | FMDV and E2 Fusion Proteins and Uses Thereof                                                        | 15888718   |            |
| United States of America | Published          | Inactivated Canine Influenza Vaccines and Methods of Making and Uses Thereof                        | 15846735   |            |
| United States of America | Published          | Novel Cryopreservation Bags and method of use thereof for Closed System, High Capacity Cell-Banking | 15840701   |            |
| United States of America | Published          | Attenuated Swine Influenza Vaccines and Methods of Making and Use Thereof                           | 15828067   |            |
| United States of America | Published          | Use of Morpholino Compounds for the Treatment of Halitosis                                          | 15726413   |            |
| United States of America | Published          | Egg Candling and Relocation Apparatus for Use with In Ovo Injection Machines                        | 15686234   |            |
| United States of America | Published          | Attenuated Pasteurella Multocida Vaccines & Methods of Making & Use Thereof.                        | 15668946   |            |
| United States of America | Published          | PARASITICIDAL COMPOSITIONS COMPRISING INDOLE DERIVATIVES, METHODS AND USES THEREOF                  | 15632705   |            |
| United States of America | Published          | Multi-chamber, Multi-formulation Fluid Delivery System                                              | 15620421   |            |
| United States of America | Published          | Laser Ablation Machine for Labeling Cryogenically-Frozen Vials                                      | 15499127   |            |
| United States of America | Published          | Powered Injection Device for Delivering Multiple Liquid Formulations, Including Vaccines            | 15487308   |            |
| United States of America | Published          | PROCESS FOR THE PREPARATION OF ISOXAZOLINE COMPOUNDS                                                | 15480316   |            |
| United States of America | Published          | HEARTWORM VACCINE, METHODS AND USES THEREOF                                                         | 15480345   |            |

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| Country Name             | Application Status | App Title                                                                                                                      | App Number | Pat Number |
|--------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Published          | SINGLE OR DUAL TECHNOLOGY ANIMAL TAGS AND SYSTEM AND METHOD OF USING THE SAME                                                  | 15474300   |            |
| United States of America | Published          | LONG-ACTING INJECTABLE FORMULATIONS COMPRISING AN ISOXAZOLINE ACTIVE AGENT, METHODS AND USES THEROF.                           | 15441297   |            |
| United States of America | Published          | NEWCASTLE DISEASE VIRUS VECTORED AVIAN VACCINES                                                                                | 15434353   |            |
| United States of America | Published          | Antioxidants Against Oxidative Stress During a Stressor Event                                                                  | 15423280   |            |
| United States of America | Published          | ANTHELMINTIC DEPSIPEPTIDE COMPOUNDS                                                                                            | 15378219   |            |
| United States of America | Published          | Methods of Providing Grass Growth and Nematode Suitability Indices to Assist Determination of Timing of Parasiticide Treatment | 15378729   |            |
| United States of America | Published          | M Hyo Multivalent Vaccine and Uses Thereof                                                                                     | 15378165   |            |
| United States of America | Published          | Automated Caged Bird Spray Vaccination System                                                                                  | 15292950   |            |
| United States of America | Published          | HENDRA VIRUS RECOMBINANT COMPOSITIONS AND USES THEREOF                                                                         | 15233013   |            |
| United States of America | Published          | Naphthyl-Or Isoquinoliny-Substituted Isothiazoline Compounds                                                                   | 14757414   |            |
| United States of America | Published          | HIGH THROUGHPUT METHODS FOR VIRUS QUANTIFICATION                                                                               | 15215106   |            |
| United States of America | Published          | Thiophene-Or Furan-Substituted Isothiazoline Compounds as Pesticides                                                           | 14757930   |            |
| United States of America | Published          | Inline Avian Vaccine Sprayer with Rapidly-Actuating Spray Nozzles                                                              | 15160614   |            |
| United States of America | Published          | Long-range Spray Vaccinator                                                                                                    | 15154082   |            |

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| Country Name             | Application Status | App Title                                                                                                 | App Number | Pat Number |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Published          | BLUETONGUE VIRUS RECOMBINANT VACCINES AND USES THEREOF                                                    | 15098350   |            |
| United States of America | Published          | EXTENDED RELEASE INJECTABLE FORMULATIONS COMPRISING AN ISOXAZOLINE ACTIVE AGENT, METHODS AND USES THEROF  | 15092491   |            |
| United States of America | Published          | ANTHELMINTIC COMBINATIONS AND METHODS OF USE THEREOF                                                      | 15089282   |            |
| United States of America | Published          | LONG-ACTING INJECTABLE FORMULATIONS COMPRISING AN ISOXAZOLINE ACTIVE AGENT, METHODS AND USES THEROF.      | 15054260   |            |
| United States of America | Published          | Leptospira immunoprotective Proteins and Methods of Identification and Use Thereof                        | 15050155   |            |
| United States of America | Published          | EXPRESSION OF CHIMERIC KSAC PROTEIN AND METHOD OF PRODUCING SOLUBLE PROTEIN BY HIGH PRESSURE              | 15017486   |            |
| United States of America | Published          | PARASITICIDAL ORAL VETERINARY COMPOSITIONS COMPRISING ISOXAZOLINE ACTIVE AGENTS, METHODS AND USES THEREOF | 15009996   |            |
| United States of America | Published          | ANTIBIOTIC-FREE PLASMID                                                                                   | 14930710   |            |
| United States of America | Published          | Recombinant NDV Antigen and Uses Thereof                                                                  | 12979677   |            |
| United States of America | Granted            | Leishmania Vaccine Using Sand Fly Salivary Immunogen                                                      | 14069406   | 9228002    |
| United States of America | Granted            | Leishmania Challenge Model                                                                                | 13841949   | 8906358    |
| United States of America | Granted            | PRODUCTION OF HEMAGGLUTININ-NEURAMINIDASE PROTEIN IN MICROALGAE                                           | 12980320   | 9012197    |

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| Country Name             | Application Status | App Title                                                                                                                         | App Number | Pat Number |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Published          | Mammalian Cell Lines Expressing Functional Nematode Acetylcholine Receptors, and Use thereof for High-Throughput Screening Assays | 14849446   |            |
| United States of America | Published          | Novel immunogenic formulations comprising linear or branched polyacrylic acid polymer adjuvants                                   | 15624405   |            |
| United States of America | Granted            | ADJUVANT RABIES VACCINE WITH IMPROVED VISCOSITY PROFILE                                                                           | 13451667   | 9216213    |
| United States of America | Granted            | Hyperbaric Device and Methods for Producing Inactivated Vaccines and for Refolding/Solubilizing Recombinant Proteins              | 14851457   | 10080791   |
| United States of America | Granted            | RECOMBINANT AVIAN PARAMYXOVIRUS VACCINE AND METHOD FOR MAKING AND USING THEREOF                                                   | 12860589   | 8486418    |
| United States of America | Granted            | Coccidial Vaccine and Methods of Making and Using Same                                                                            | 11/106,780 | 6998127    |
| United States of America | Granted            | Coccidial Vaccine and Methods of Making and Using Same                                                                            | 10/730,206 | 6908620    |
| United States of America | Published          | REASSORTANT BTV AND AHSV VACCINES                                                                                                 | 13917259   |            |
| United States of America | Published          | RECOMBINANT VECTORS EXPRESSING ANTIGENS OF AVIAN INFLUENZA VIRUS AND USES THEREOF                                                 | 15789936   |            |
| United States of America | Granted            | MODIFIED LIVE (JMSO STRAIN) HAEMOPHILUS PARASUIS VACCINE                                                                          | 11648390   | 8404253    |
| United States of America | Granted            | PROCESS FOR PREPARING PESTICIDAL INTERMEDIATES                                                                                    | 9572948    | 6258973    |
| United States of America | Granted            | Pesticides                                                                                                                        | 10238902   | 6593328    |
| United States of America | Granted            | Pesticides                                                                                                                        | 10060229   | 6500848    |
| United States of America | Granted            | Pesticides                                                                                                                        | 9930946    | 6376520    |
| United States of America | Granted            | PYRAZOLE PESTICIDES                                                                                                               | 9404809    | 6432997    |

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| Country Name             | Application Status | App Title                                                                                                              | App Number | Pat Number |
|--------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Granted            | AVERMECTIN B1 AND AVERMECTIN B1 MONOSACCHARIDE DERIVATIVES HAVING AN ALKOXYMETHYL SUBSTITUENT IN THE 4"-OR 4'-POSITION | 12768280   | 8017589    |
| United States of America | Granted            | DERIVATIVES OF AVERMECTIN, AVERMECTIN MONOSACCHARIDE AND AVERMECTIN AGLYCON                                            | 11574588   | 7781411    |
| United States of America | Granted            | AVERMECTIN AND AVERMECTIN MONOSACCHARIDE DERIVATIVES SUBSTITUTED IN THE 4"-OR 4'-POSITION HAVING PESTICIDAL PROPERTIES | 10543637   | 7678740    |
| United States of America | Granted            | AVERMECTIN AND AVERMECTIN MONOSACCHARIDE SUBSTITUTED IN THE 4"-AND 4'-POSITION RESPECTIVELY                            | 10599671   | 7687470    |
| United States of America | Granted            | AVERMECTIN B1 AND AVERMECTIN B1 MONOSACCHARIDE DERIVATIVES HAVING AN ALKOXYMETHYL SUBSTITUENT IN THE 4"-OR 4'-POSITION | 10539274   | 7737261    |
| United States of America | Pending            | PET CARE COMPOSITIONS                                                                                                  | 15774531   |            |
| United States of America | Pending            | PET CARE COMPOSITIONS                                                                                                  | 15774534   |            |
| United States of America | Published          | STORAGE AND DISPENSER DEVICE                                                                                           | 15769664   |            |
| United States of America | Published          | Live Attenuated Heterologous Vaccine for Leptospira                                                                    | 15763892   |            |
| United States of America | Published          | RECOMBINANT HVT VECTORS EXPRESSING MULTIPLE ANTIGENS OF AVIAN PATHOGENS AND USES THEREOF                               | 15840764   |            |
| United States of America | Published          | ANTHELMINTIC COMPOUNDS AND COMPOSITIONS AND METHOD OF USING THEREOF                                                    | 15544837   |            |

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| Country Name             | Application Status | App Title                                                                                                              | App Number | Pat Number |
|--------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------|------------|------------|
| United States of America | Published          | PARASITICIDAL COMPOSITIONS COMPRISING FIPRONIL AND METHOPRENE SPOT-ON FORMULATION HAVING A HIGH FIPRONIL CONCENTRATION | 15522647   |            |
| United States of America | Pending            | Borrelia burgdorferi prophylaxis                                                                                       | 62663497   |            |
| United States of America | Pending            | OSTEOARTHRITIS TREATMENT WITH MULTIPOTENT ADULT PROGENITOR CELLS                                                       | 62670634   |            |
| United States of America | Pending            | OSTEOARTHRITIS TREATMENT WITH MULTIPOTENT ADULT PROGENITOR CELLS                                                       | 62692938   |            |
| United States of America | Pending            | PROBIOTICS FOR ENHANCING THE HEALTH PERFORMANCE OF POULTRY                                                             | 62691968   |            |
| United States of America | Pending            | Anthelmintic Heterocyclic Compounds                                                                                    | 62695656   |            |
| United States of America | Pending            | STAND ALONE DISPENSING POUCH                                                                                           | 62696715   |            |
| United States of America | Pending            | HEALTH DEVICE FOR PETS AND METHODS THEREOF                                                                             | 62697562   |            |
| United States of America | Pending            | PRODUCTION OF BIOLOGICAL AGENTS USING DETACHED ADHERENT CELLS                                                          | 62733576   |            |
| United States of America | Pending            | FMDV RECOMBINANT VACCINES AND USES THEREOF                                                                             | 62746593   |            |
| United States of America | Pending            | FMDV RECOMBINANT VACCINES AND METHODS OF THEIR PRODUCTION                                                              | 62746989   |            |
| United States of America | Pending            | Ozone System and Methods for Producing Vaccines from Embryonated Eggs or Egg-Derived Cells                             | 62760677   |            |
| United States of America | Pending            | Indazolyloxyethylamino Compound, Compositions of Same, Method Of Making, And Methods Of Using Thereof                  | 62769850   |            |
| United States of America | Pending            | Composition And Method For Controlling Atopic Dermatitis                                                               | 62782309   |            |

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| Country Name             | Application Status | App Title                                                                                                                          | App Number     | Pat Number |
|--------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------|------------|
| United States of America | Pending            | Attenuated Bordetella bronchiseptica Strains, Oral Vaccines Containing the Attenuated Strains, and Methods of Making & Use Thereof | 62788764       |            |
| United States of America | Pending            | Attenuated Bordetella bronchiseptica Strains, Oral Vaccines Containing the Attenuated Strains, and Methods of Making & Use Thereof | 62782289       |            |
| WO                       | Published          | Pesticidal and Parasitocidal Vinyl-Isoxazoline Compounds                                                                           | PCTUS1756130   |            |
| WO                       | Published          | RECOMBINANT VECTORS EXPRESSING ANTIGENS OF AVIAN INFLUENZA VIRUS AND USES THEREOF                                                  | PCTUS1757741   |            |
| WO                       | Published          | ANTHELMINTIC DEPSIPEPTIDE COMPOUNDS                                                                                                | PCTUS1761832   |            |
| WO                       | Published          | Attenuated Swine Influenza Vaccines and Methods of Making and Use Thereof                                                          | PCTUS1764017   |            |
| WO                       | Published          | RECOMBINANT HVT VECTORS EXPRESSING MULTIPLE ANTIGENS OF AVIAN PATHOGENS AND USES THEREOF                                           | PCTUS1766139   |            |
| WO                       | Published          | Method for Determining the Effectiveness of Treatment for the Prevention of Heartworm Disease                                      | PCT/US18/17398 |            |
| WO                       | Published          | Liquid Applicator for Delivering Vaccines                                                                                          | PCT/US18/18056 |            |
| WO                       | Published          | CRYSTALLINE FORMS OF (S)-AFOXOLANER                                                                                                | PCTUS1826328   |            |
| WO                       | Published          | Dual Active Parasitocidal Granule Compositions, Methods and Uses Thereof                                                           | PCTUS1839361   |            |
| WO                       | Published          | Pesticidal Pyrazole-substituted Isoxazoline Compounds                                                                              | PCTUS1846601   |            |
| WO                       | Pending            | METHOD AND SYSTEM FOR TRACKING A PLURALITY OF ANIMALS WITH A PORTABLE COMPUTING DEVICE                                             | PCTUS1849030   |            |
| WO                       | Pending            | Streptococcus vaccines and uses thereof                                                                                            | PCTUS1849041   |            |

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| Country Name             | Application Status | App Title                                                                                     | App Number   | Pat Number |
|--------------------------|--------------------|-----------------------------------------------------------------------------------------------|--------------|------------|
| WO                       | Pending            | METHOD AND SYSTEM FOR TRACKING ANIMALS AND ALERTING ANIMAL OWNERS OF LOST ANIMALS             | PCTUS1852723 |            |
| WO                       | Pending            | PARASITICIDAL COMPOSITIONS COMPRISING EPRINOMECTIN AND PRAZIQUANTEL, METHODS AND USES THEREOF | PCTUS1917143 |            |
| United States of America | Granted            | P. Ariasi Polypeptides, P. Perniciosus Polypeptides and Methods of Use                        | 10527500     | 7741437    |
| United States of America | Granted            | Method for producing the Flu Virus                                                            | 12238740     | 7871807    |
| United States of America | Granted            | STAT6 EFFECTS ON LIVESTOCK ANIMAL GROWTH                                                      | 12112752     | 7972790    |