

Product Portfolio

A Selection



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Respiratory Diseases

Respiratory diseases are very common. Chronic obstructive pulmonary disease (COPD) and bronchial asthma are among the most prevalent chronic diseases and a frequent cause of morbidity and premature deaths worldwide.

Idiopathic pulmonary fibrosis (IPF) is a rare disease which is severely debilitating and ultimately lethal.

COPD

COPD is a common, preventable, and treatable disease characterized by persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases. The most common respiratory symptoms include dyspnea, cough and/or sputum production. The limitation of airflow causes shortness of breath and other respiratory symptoms. The airflow limitation is only partially reversible and usually worsens over time, leading to disability and ultimately to death. Symptoms such as excess cough and breathlessness are the main reasons why COPD is very debilitating for patients. Lung emphysema and chronic bronchitis are the main manifestations of COPD.

COPD is caused by continuous damage to the lungs resulting from inhaling pollutants, primarily cigarette smoke. However, other factors also need to be considered including indoor and outdoor air pollution. The course of COPD, which is a disease that occurs in the second half in a human's life, is characterized by an accelerated loss of lung function compared to normal ageing and by occasional sudden worsening of symptoms and function referred to as acute exacerbations. This can lead to a downward spiral of worsening symptoms and thus further inactivity.

Bronchial asthma

Bronchial asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. The inflammation is accompanied by airway hyper-responsiveness, which leads to a narrowing of the airways and recurrent episodes of wheezing, breathlessness, and coughing. These symptoms occur particularly at night or in the early hours of the morning. It is now known that asthma can be triggered by genetic and environmental factors (e.g. allergens and viral infections). Unlike COPD, asthma can occur very early in childhood; it can also be present in adolescents or adults. Asthma is often underestimated as an easy-to-manage condition. However, almost one in two patients with asthma still experience symptoms while receiving maintenance therapy, putting them at increased risk of potentially life-threatening asthma exacerbations. In addition, patients often adjust their daily lives to accommodate their conditions and avoid physical exertion in day-to-day activities, which has a negative impact on quality of life.

Indications	Brand Names	Active Ingredients	The label varies by country. Please refer to the local product information
Chronic obstructive pulmonary disease (COPD)	SPIRIVA® SPIRIVA® HANDIHALER® SPIRIVA® RESPIMAT®	 <i>tiotropium bromide</i>	Maintenance treatment of patients with COPD (including chronic bronchitis and emphysema), maintenance treatment of associated dyspnoea and for prevention of exacerbations.
Bronchial asthma	SPIRIVA® RESPIMAT®	 <i>tiotropium bromide</i>	An add-on maintenance bronchodilator treatment in patients aged six years and older with severe asthma who experienced one or more severe asthma exacerbations in the past year.
Chronic obstructive pulmonary disease (COPD)	SPIOLTO® RESPIMAT® STIOLTO® RESPIMAT® INSPIOLTO® RESPIMAT®	 <i>tiotropium bromide, olodaterol hydrochloride</i>	Maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD).
Chronic obstructive pulmonary disease (COPD)	STRIVERDI® RESPIMAT®	 <i>olodaterol hydrochloride</i>	Maintenance treatment of patients with chronic obstructive pulmonary disease (COPD).
Reversible broncho-spasms associated with obstructive airway diseases	COMBIVENT® RESPIMAT®	 <i>ipratropium bromide, salbutamol, sulphate</i>	A combination of a short-acting anticholinergic and beta-adrenergic for the management of reversible bronchospasms associated with obstructive airway diseases in patients requiring more than one bronchodilator.
Chronic obstructive pulmonary disease (COPD) Chronic bronchitis Bronchial asthma	ATROVENT®	 <i>ipratropium bromide</i>	Prevention and treatment of shortness of breath in patients with chronic obstructive pulmonary disease (COPD) and mild to moderate bronchial asthma in adulthood and childhood as a supplement to beta-agonists in cases of acute asthma.
Chronic obstructive airway disorders	BERODUAL® BRONCHODUAL® DUOVENT®	 <i>ipratropium bromide, fenoterol hydrobromide</i>	Prevention and treatment of symptoms in chronic obstructive airway disorders with reversible airflow limitation such as bronchial asthma and especially chronic bronchitis with or without emphysema.

Respiratory Diseases (continued)

Idiopathic pulmonary fibrosis (IPF)

IPF is a chronic progressive lung disease associated with a markedly reduced life span and affecting as many as 14–43 people per 100,000 worldwide. IPF is characterized by progressive scarring of lung tissue and a loss of lung function over time. Development of scarred tissue is called fibrosis. Over time, as the tissue thickens and stiffens with scarring, the lungs lose their ability to take in and transfer oxygen into the bloodstream, and vital organs do not get enough oxygen. As a result, individuals with IPF experience shortness of breath, even when resting, and often have difficulty coping with the demands of everyday life due to their limited physical capacity.

Acute IPF exacerbations are defined as rapid deteriorations of symptoms and lung function within days or weeks. These events can occur at any point in the course of the disease, even at first presentation, and are associated with high mortality. All patients with IPF are at risk of acute IPF exacerbations.

Systemic sclerosis associated interstitial lung disease (SSc-ILD)

Systemic sclerosis (SSc), also known as scleroderma, is a rare incurable autoimmune disease affecting connective tissue. The disease is estimated to affect 15 to 24 people in every 100,000 in Europe and 2.5 million worldwide. SSc impacts four times as many women as men, and the onset of the disease typically occurs at a young age – between 25 and 55 years. It can cause scarring (fibrosis) of the skin as well as major organs such as the heart, lungs, digestive tract and kidneys and can have life-threatening complications. Approximately 25% of patients develop significant pulmonary involvement within three years of diagnosis.

When SSc affects the lungs, it can cause interstitial lung disease (ILD), known as SSc-ILD. It is a key driver of mortality among people with SSc, accounting for approximately one third of deaths.

Other chronic fibrosing interstitial lung diseases (ILDs) with a progressive phenotype beyond idiopathic pulmonary fibrosis (IPF)

Interstitial lung diseases are a heterogeneous group of more than 200 mostly rare conditions of the lung that run the risk of developing pulmonary fibrosis. Fibrosis is a pathological multiplication of the connective tissue leading to usually chronic and irreversible scarring of the lung tissue. The course of interstitial lung disease may develop into a progressive fibrosing ILD, leading to a decline function associated with increased morbidity and mortality. Idiopathic pulmonary fibrosis (IPF) is a phenotype of a chronic fibrosing ILD. The course of the disease and symptoms are similar to chronic PF-ILDs, despite the underlying ILD diagnosis. On average, 18–32% of ILD patients will develop progressive pulmonary fibrosis.

Indications	Brand Names	Active Ingredients	The label varies by country. Please refer to the local product information
Bronchial asthma	BEROTEC®	<i>fenoterol hydrobromide</i>	Symptomatic treatment of acute asthma attacks. Prophylaxis of exercise-induced asthma bronchiale. Symptomatic treatment of allergic and non-allergic asthma bronchiale and other conditions with reversible airway narrowing, e.g. chronic obstructive bronchitis.
Bronchial asthma Allergic rhinitis	ALESION®	<i>epinastine hydrochloride</i>	Prophylactic treatment of patients with bronchial asthma. Prophylaxis and symptomatic treatment of allergic rhinitis.
Idiopathic pulmonary fibrosis (IPF) Systemic sclerosis associated interstitial lung disease (SSc-ILD) Chronic fibrosing interstitial lung diseases (ILDs) with a progressive phenotype	OFEV®	<i>nintedanib</i>	In 89 countries for the treatment of patients with idiopathic pulmonary fibrosis (IPF). In 85 countries as therapy for SSc-ILD to slow down the rate of decline in pulmonary function. In 83 countries for the treatment of other chronic fibrosing interstitial lung diseases (ILDs) with a progressive phenotype beyond IPF.

Cardiovascular and Metabolic Diseases

Cardiovascular disease (CV), including heart disease and stroke, is a major global health concern and the leading cause of death and disability worldwide. Currently, it is responsible for nearly one in three deaths worldwide. One key risk factor for developing cardiovascular disease is the presence of diabetes: people with type 2 diabetes are two to four times more likely to develop cardiovascular disease than people without diabetes, and as a result, their life expectancy is up to 12 years shorter. Proper control of diabetes and other treatable risk factors like heart failure is therefore vital for the prevention of cardiovascular events.

Stroke

Stroke is the rapidly developing loss of brain functions caused by a disrupted blood flow to the affected brain tissue. This can be due to ischemia (lack of blood supply) caused by thrombosis or embolism, or due to bleeding (hemorrhagic stroke). As a result, the affected area of the brain is unable to function and the damage may quickly become permanent, if untreated. A stroke is an acute event requiring emergency diagnosis and intervention. Worldwide, stroke is one of the leading causes of death and long-term disability.

Atrial fibrillation

Atrial fibrillation (AF) is the most common sustained heart rhythm condition, affecting approximately 2% of the total population. One in four adults over 40 develops AF in their lifetime. Patients with AF are at higher risk of developing blood clots in their upper left heart chamber, which can cause a stroke if the clot breaks loose and travels to the brain. AF leads to a five-fold increase in the risk of stroke, resulting in up to three million patients worldwide suffering AF-related strokes each year. For patients with AF, the risk of stroke can be reduced by appropriate anticoagulation therapy.

Prevention and treatment of venous thromboembolism

Venous thromboembolism (VTE) is an umbrella term that encompasses deep vein thrombosis (DVT) and pulmonary embolism (PE). DVT occurs when a thrombus (blood clot) forms in a deep vein, most commonly in the leg, and partially or completely blocks the flow of blood. As the thrombus grows, a portion may break away from the main clot and travel in the circulatory system to the lungs. The lodging of a blood clot in the arteries of the lung is called a PE. VTE is a serious disorder with potentially fatal consequences.

Patients undergoing orthopedic surgery are at considerable risk of developing DVT, and chronic venous insufficiency and/or pulmonary hypertension may develop in the longer term.

Indications	Brand Names	Active Ingredients	The label varies by country. Please refer to the local product information
Stroke prevention in atrial fibrillation			Prevention of strokes and blood clots in patients with atrial fibrillation.
Primary prevention of venous thromboembolic events after orthopedic surgery			Primary prevention of venous thrombo-embolic events (VTE) in adults after elective total hip or knee replacement surgery.
Treatment and secondary prevention of venous thromboembolic events	PRADAXA® PRADAXAR® PRAZAXA®	 <i>dabigatran etexilate</i>	Treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE), and secondary prevention of recurrent DVT and PE in adults.
Specific reversal of PRADAXA® (dabigatran etexilate)	PRAXBIND®	 <i>idarucizumab</i>	PRAXBIND® is a specific reversal agent for dabigatran and is indicated in adult patients treated with PRADAXA® (dabigatran etexilate) when rapid reversal of its anticoagulant effects is required: for emergency surgery / urgent procedures; in life-threatening or uncontrolled bleeding.
Hypertension	MICARDIS®	 <i>telmisartan</i>	<p>Treatment of hypertension.</p> <p>Lowering blood pressure reduces the risk of fatal and nonfatal cardiovascular events, primarily strokes and myocardial infarctions. Not indicated for initial therapy (US).</p> <p>For the reduction of the risk of myocardial infarction (heart attack), stroke or death from cardiovascular (CV) causes in patients 55 years of age or older at high risk of developing major CV events who are unable to take ACE inhibitors (US).</p>
Cardiovascular morbidity and mortality prevention	MICARDIS®	<i>telmisartan</i>	For the reduction of cardiovascular morbidity in patients with manifest atherothrombotic cardiovascular disease (history of coronary heart disease, stroke or peripheral arterial disease), or patients with type 2 diabetes mellitus with documented target organ damage (EU).
Hypertension	MICARDISPLUS® MICARDIS® PLUS MICARDIS® HCT CO-MICARDIS®	 <i>telmisartan, hydrochlorothiazide</i>	<p>Treatment of hypertension alone or with other antihypertensive agents, to lower blood pressure. Lowering blood pressure reduces the risk of fatal and nonfatal cardiovascular events, primarily strokes and myocardial infarctions. Not indicated for initial therapy (US).</p> <p>Treatment of essential hypertension. MICARDISPLUS® fixed dose combination is indicated in adults whose blood pressure is not adequately controlled on telmisartan alone (EU).</p>

Cardiovascular and Metabolic Diseases (continued)

To prevent VTE events and their consequences after orthopedic surgery, patients should receive some kind of thromboprophylaxis. Patients who have already suffered from VTE require anticoagulant treatment for secondary prevention of a recurrent thromboembolic event.

Reversing anticoagulation

Anticoagulation therapy offers important benefits for patients at risk of thromboembolic events. However, even though rare, there may be situations when rapid reversal of anticoagulation is medically necessary, e.g. if a patient taking an anticoagulant is involved in a severe car accident and needs emergency surgery.

Hypertension and cardiovascular diseases

Hypertension (high blood pressure) is a chronic disease in which the blood pressure is chronically elevated. Hypertension is also one of the major risk factors for stroke, heart attacks, heart failure and chronic renal failure. The primary goal of antihypertensive treatment is to prevent such cardiovascular events and to reduce the risk of cardiovascular mortality.

Acute myocardial infarction

An acute myocardial infarction, or heart attack, occurs when a thrombus (blood clot) suddenly prevents blood flow to an area of the heart muscle. Unless the blood flow is restored quickly, the affected section of heart muscle becomes permanently damaged. Heart attacks are one of the most common causes of death in industrialized countries.

Indications	Brand Names	Active Ingredients	The label varies by country. Please refer to the local product information
Hypertension	TWINSTA® MICAMLO® MICARDIS® AMLO MICARDIS® DUO	 <i>telmisartan, amlodipine</i>	Add-on therapy in adult patients with not adequately controlled blood pressure on amlodipine, and replacement therapy in adult patients receiving telmisartan and amlodipine from separate tablets (EU).
Acute ischemic stroke Acute myocardial infarction Acute massive pulmonary embolism	ACTILYSE®	 <i>alteplase</i>	Fibrinolytic treatment of acute ischemic stroke, acute myocardial infarction, acute massive pulmonary embolism.
Catheter clearance due to thrombotic occlusion	ACTILYSE® CATHFLO®	 <i>alteplase</i>	Fibrinolytic treatment of occluded catheters.
Acute myocardial infarction	METALYSE®	 <i>tenecteplase</i>	Fibrinolytic treatment of acute myocardial infarction.

Cardiovascular and Metabolic Diseases (continued)

Diabetes, heart failure, and the cardio-renal-metabolic system

Type 2 diabetes is a chronic, progressive condition associated with elevated blood sugar levels. People with type 2 diabetes have a high burden of comorbidities, which include hypertension, obesity, cardiovascular disease, kidney disease and heart failure. Cardio-renal-metabolic conditions affect more than one billion people worldwide and are a leading cause of death.

Heart failure is a progressive, debilitating, and potentially fatal condition that occurs when the heart cannot supply adequate circulation to meet the body's demands for oxygenated blood, or to do so requires increased blood volume leading to fluid accumulation (congestion) in the lungs and peripheral tissues. It is a widespread condition affecting over 60 million people worldwide and expected to increase as the population ages.

A collaborative multidisciplinary team approach to optimize patient care by coordinating treatment of related comorbidities, including the use of emerging medications with broad cardiovascular, renal, and metabolic effects, can help improve outcomes for people with these serious chronic conditions.

Indications	Brand Names**	Active Ingredients	The label varies by country. Please refer to the local product information
Type 2 diabetes mellitus	JARDIANCE® JARDIANZ®	 <i>empagliflozin</i>	Treatment of adults with type 2 diabetes mellitus as an adjunct to diet and exercise to improve glycemic control and to reduce the risk of cardiovascular death in adults with type 2 diabetes mellitus and established cardiovascular disease.
Heart failure	JARDIANCE® JARDIANZ®	 <i>empagliflozin</i>	Treatment of adults with symptomatic chronic heart failure, which includes patients across the full spectrum of LVEF, including both heart failure with reduced and preserved ejection fraction (with or without type 2 diabetes).
Type 2 diabetes mellitus	SYNJARDY® JARDIANCE DUO® JARDIANZ DUO® SYNJARDY® XR	 <i>empagliflozin, metformin hydrochloride</i>	Treatment of adults with type 2 diabetes mellitus as an adjunct to diet and exercise to improve glycemic control when treatment with both empagliflozin and metformin is appropriate.
Type 2 diabetes mellitus	GLYXAMBI® TRADIANCE® JARDIANZ DPP®	 <i>empagliflozin, linagliptin</i>	Treatment of adults with type 2 diabetes mellitus as an adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus when both empagliflozin and linagliptin are appropriate treatments.
Type 2 diabetes mellitus	TRAJENTA® TRADJENTA® TRAZENTA® TRAYENTA®	 <i>linagliptin</i>	Treatment of adults with type 2 diabetes mellitus as an adjunct to diet and exercise to improve glycemic control, used in monotherapy (if metformin is not tolerated or contraindicated) or in combination therapy.
Type 2 diabetes mellitus	JENTADUETO® TRAYENTA DUO® TRAJENTA DUO® TRAJENTAMET® JENTADUETO® XR	 <i>linagliptin, metformin hydrochloride</i>	Treatment of adults with type 2 diabetes mellitus as an adjunct to diet and exercise to improve glycemic control when treatment with metformin does not lead to sufficient control or when patients are treated with TRAJENTA® (linagliptin) and metformin.

** Diabetes portfolio in collaboration with Eli Lilly and Company.

Dermatology

Generalized Pustular Psoriasis (GPP)

GPP is a rare, heterogenous and potentially life-threatening neutrophilic skin disease, which is clinically distinct from plaque psoriasis. GPP is caused by neutrophils (a type of white blood cell) accumulating in the skin, resulting in painful, sterile pustules all over the body. The clinical course varies, with some patients having a relapsing disease with recurrent flares, and others having a persistent disease with intermittent flares. While the severity of GPP flares can vary, if left untreated they can be life-threatening due to complications such as sepsis and multisystem organ failure. This chronic, systemic disease has

a substantial quality of life impact for patients and increased healthcare burden. GPP has a varied prevalence across different geographical regions and more women are affected than men. There is a high unmet need for treatments that can rapidly resolve the symptoms of GPP flares and prevent their reoccurrence, with an acceptable safety profile.

GPP flares can lead to hospitalization with serious complications, including heart failure, renal failure and sepsis, and the unpredictability and severity of these flares greatly affect a person's quality of life.

Oncology

Cancer is a threat to global health. Cancer is a leading cause of death worldwide, accounting for nearly 10 million deaths in 2020, or nearly one in six global deaths. Newly diagnosed cases of cancer have risen to 19.3 million in 2020. The most common causes of cancer death in 2020 were lung cancer (18%), colon and rectum cancer (9.4%), liver cancer (8.3%), stomach cancer (7.7%), and breast cancer (6.9%).

Lung cancer

Lung cancer refers to malignant abnormal cell growth inside the lung tissue. It is the most common cause of death with estimated 1.80 million deaths worldwide in

2020, representing nearly 20% of all cancer deaths. Smoking is the primary cause of the disease, contributing to almost 90% of the cases. Recently, however, the incidence of lung cancer among non-smokers has increased. Lung cancer symptoms are unspecific so the disease may take many years to appear. Late diagnosis in an advanced stage of the disease results in an often dismal prognosis, with only 10–15% of lung cancer patients surviving five years or more following diagnosis.

A correct diagnosis is essential for appropriate and effective treatment because every cancer type requires a specific treatment regimen. Proper selection of a treatment regimen takes into consideration both the cancer and the individual being treated.

Indications	Brand Names	Active Ingredients	The label varies by country. Please refer to the local product information
Generalized Pustular Psoriasis	SPEVIGO®	 <i>spesolimab</i>	Treatment for generalized pustular psoriasis (GPP) flares in adults.
Indications	Brand Names	Active Ingredients	The label varies by country. Please refer to the local product information
Non-small cell lung cancer (NSCLC)	GIOTRIF® GILOTRIF®	 <i>afatinib</i>	<p>As monotherapy in TKI-naïve adult patients with locally advanced or metastatic non-small cell lung cancer (NSCLC) whose tumors have activating epidermal growth factor receptor (EGFR) mutations.</p> <p>For the treatment of patients with locally advanced or metastatic NSCLC of squamous histology progressing on or after platinum-based chemotherapy.</p>
Non-small cell lung cancer (NSCLC)	VARGATEF®	 <i>nintedanib</i>	In combination with docetaxel for the treatment of adult patients with locally advanced, metastatic or locally recurrent non-small cell lung cancer (NSCLC) of adenocarcinoma tumor histology after first-line chemotherapy.

Diseases of the Central Nervous System

Mental and neurological diseases such as depression and Parkinson's disease significantly impact patients and their families and are also a substantial burden to society.

Parkinson's disease

Parkinson's disease (PD) is a degenerative disorder of the central nervous system. Patients usually notice motor symptoms like hand shaking (tremor) as their first sign of the disease, which may progress to include shaking of the arms, legs or head. Other motor symptoms that may develop over time include stiffness that often results in loss of facial expression and a gradual slowing or loss of motion, or "freezing". About 30–40% of patients also suffer from non-motor symptoms associated with PD, such as depression and sleep disorders. The primary signs and symptoms are the result of a lack of the neuro-transmitter dopamine in distinct areas of the human brain.

Restless legs syndrome (RLS)

RLS is a common neurological disorder characterized by an uncontrollable urge to move the legs, primarily occurring in the evening and night hours. It is usually accompanied by unpleasant and sometimes painful sensations in the legs as well as disturbed sleep resulting in daytime tiredness or sleepiness. The sensations are felt deep within the legs and are described as creeping, crawling or aching.

Infectious Diseases

HIV infection / AIDS

Acquired immune deficiency syndrome (AIDS) is a set of symptoms and infections resulting from the damage to the human immune system caused by the human immunodeficiency virus (HIV). If untreated, infection with HIV progressively reduces the effectiveness of the immune system and leaves individuals susceptible to opportunistic infections and tumors. Babies of infected mothers are at risk of getting the virus during pregnancy, childbirth or breastfeeding.

Indications	Brand Names	Active Ingredients	The label varies by country. Please refer to the local product information
Parkinson's disease (PD)	SIFROL® MIRAPEX® MIRAPEXIN® PEXOLA® MIRAPEX® ER SIFROL® ER	 <i>pramipexole,</i> <i>pramipexole dihydrochloride</i> <i>monohydrate</i>	Treatment of the signs and symptoms of idiopathic Parkinson's disease, alone or in combination with levodopa.
Restless legs syndrome (RLS)	SIFROL® MIRAPEX® MIRAPEXIN® PEXOLA®	 <i>pramipexole,</i> <i>pramipexole dihydrochloride</i> <i>monohydrate</i>	Symptomatic treatment of moderate to severe idiopathic restless legs syndrome.
Sleep disorders	LENDORMIN®	 <i>brotizolam</i>	Short-term treatment of disorders of initiating and maintaining sleep. Insomnia requiring pharmacological intervention.
Indications	Brand Names	Active Ingredients	The label varies by country. Please refer to the local product information
HIV/AIDS	VIRAMUNE® VIRAMUNE XR®	 <i>nevirapine</i>	For the combination therapy of HIV-1 infection and (in several countries) for the prevention of mother-to-child transmission of HIV-1 in pregnant women who are not taking antiretroviral therapy at time of labor. Prolonged release tablets for once-daily dosing within combination therapy.
HIV/AIDS	APTIVUS®	 <i>tipranavir</i>	Indicated for combination antiretroviral treatment of HIV-1 infected patients, co-administered with 200 mg of ritonavir, who are treatment-experienced and infected with HIV-1 strains resistant to more than one protease inhibitor.

Companion Animals – Pets

Our pet portfolio offers diverse solutions for some of the most important needs of canine and feline health including industry-leading parasiticides, vaccines, pain therapy and therapeutics to address major chronic diseases: heart failure, kidney diseases, hypertension, epilepsy, diabetes mellitus, and osteoarthritis.

For 25 years, FRONTLINE® has been a leader in flea and tick control on dogs and cats, and is one of the most trusted brands in animal health.¹ FRONTLINE® continues to bring innovation to the category, with the recent launch of FRONTLINE® SHIELD in the US, which combines repellency and insecticidal activity against many disease-carrying flying insects, and decreases the risk of transmission of vector-borne pathogens.²

NEXGARD® contains the active ingredient afoxolaner and was launched in 2014 as the first isoxaline-based oral medication to treat both fleas and ticks in dogs. Because of its efficacy and palatable, beef-flavored soft chew formulation, NEXGARD® is currently the best-selling pet medication in the animal health industry.³

NEXGARD SPECTRA® combines the flea and tick efficacy of afoxolaner (NEXGARD®) with a broad-spectrum deworming ingredient, milbemycin oxime, in the same beef-flavored chew. NEXGARD SPECTRA® is not only effective in treating flea, tick and mite infestations, as well as gastrointestinal parasites infections, it also protects dogs against deadly parasites such as heartworm and lungworm.

HEARTGARD® PLUS contains the active ingredients ivermectin and pyrantel in a beef-flavored soft chew. When given monthly, ivermectin is effective in preventing heartworm disease. Pyrantel is effective in the treatment and control of roundworms as well as hookworms. HEARTGARD® was launched in 1987 as the first monthly heartworm preventative and is still the best-selling heartworm preventative in the world.⁴

BROADLINE® and the recently launched NEXGARD® COMBO offer cat owners all-in-one convenience providing confidence that their cat has the broadest possible protection. They protect cats against the broadest spectrum of internal and external parasites, including fleas, ticks, heartworms, hookworms, roundworms, lungworms, vesical worms, and tapeworms.

Together, our Pet Parasiticide portfolio leads the market, giving protection and confidence to more than 700 pet owners around the world every minute.

Boehringer Ingelheim has the most complete, trusted, and proven range of products and services in pain management. Choosing this portfolio gives veterinarians the freedom to tailor treatment to each patient and provides access to value-added veterinary services.

METACAM® offers an extensive range of formulations and indications, making it the complete non-steroidal anti-inflammatory drug (NSAID) for dogs, cats, and guinea pigs. It enables veterinarians to better achieve their goals in pain management and gives each owner and pet exactly the product they need. Ample long-term studies support the product's safety and efficacy and have led to multiple indications across diverse species.

The liquid formulation of METACAM® for dogs makes it easy to titrate to the lowest effective dose while the liquid formulation for cats is easy to administer. An improved dog administration syringe aimed to achieve better accuracy was introduced in 2020.

1) Data on file.

2) Babesia canis transmitted by Dermacentor reticulatus ticks, Ehrlichia canis transmitted by Rhipicephalus sanguineus ticks, and Leishmania infantum, transmitted by phlebotomine sandflies.

3) Data on file.

4) Data on file.

Indications	Brand Names	Active Ingredients	
Antiparasitic: canine/ feline external parasites	FRONTLINE® FRONTLINE COMBO® FRONTLINE PLUS® FRONTLINE TRI-ACT® FRONTECT® FRONTLINE® SHIELD	<i>fipronil</i> <i>fipronil, s-methoprene</i> <i>fipronil, permethrin, pyriproxifen</i>	 FRONTLINE PLUS®/FRONTLINE COMBO® is indicated for the treatment and prevention of flea, tick, and lice infestations. It also breaks the flea life cycle by preventing the development of flea immature stages.
			FRONTLINE TRI-ACT®/FRONTECT® and FRONTLINE® SHIELD are indicated for the treatment and prevention of flea and tick infestations in dogs. They also provide repellent activity against mosquitoes, sandflies, and ticks, reducing the risk of transmission of vector-borne pathogens.
Antiparasitic: canine external parasites	NEXGARD®	<i>afoxolaner</i>	 NEXGARD® is a highly palatable beef-flavored chew. It is indicated for the treatment and prevention of flea and tick infestations in dogs. It is also indicated for the prevention of <i>Borrelia burgdorferi</i> infections (US), and the treatment of Demodex, Sarcoptes, and Otodectes mite infestations in non-US geographies.
Antiparasitic: canine internal and external parasites	NEXGARD SPECTRA®	<i>afoxolaner, milbemycin oxime</i>	 NEXGARD SPECTRA® is delivered in a highly palatable beef-flavored chew. It is indicated for the treatment and / or prevention of flea, tick, and mite infestations. It also prevents heartworm disease, angiostrongylosis, and thelaziosis. It treats hookworm, roundworm, and whipworm infestations in dogs.
Antiparasitic: canine internal parasites	HEARTGARD® PLUS	<i>ivermectin, pyrantel</i>	 For use in dogs to prevent canine heartworm disease by eliminating the tissue stage of heartworm larvae for a month (30 days) after infection, and for the treatment and control of roundworms and hookworms.
Antiparasitic: feline internal and external parasites	BROADLINE®	<i>fipronil, (s)-methoprene, epinomectin, praziquantel</i>	 Protects cats against the broadest spectrum of internal and external parasites including adult fleas, flea eggs, flea larvae, ticks, heartworms, lungworms, hookworms, roundworms, vesical worms, and tapeworms.
Antiparasitic: feline internal and external parasites	NEXGARD® COMBO	<i>esafoxolaner, epinomectin, praziquantel</i>	 Spot-on formulation containing esafoxolaner to provide the new generation flea and tick control in cats. Protects cats against the broadest spectrum of internal and external parasites including fleas, ticks, ear mites, heartworms, lungworms, hookworms, roundworms, vesical worms, and tapeworms.
Pain and inflammatory diseases	METACAM®	<i>meloxicam</i>	 METACAM® is used to reduce specific types of post-operative pain and inflammation as well as musculoskeletal disorders in dogs and cats.

Companion Animals – Pets (continued)

PREVICOX® was designed specifically for dogs and is the most selective veterinary COX-2 inhibitor. PREVICOX® provides safe, sustained pain relief with a fast onset of action. Long-term safety and efficacy have been established in large field studies and PREVICOX® has been shown to be more efficacious than competition in acute models of osteoarthritis.

an inodilator which has become the standard of care when treating dogs with congestive heart failure caused by dilated cardiomyopathy or valvular insufficiency (mitral and / or tricuspid regurgitation). When used in combination with furosemide, it significantly improves clinical signs and extends life expectancy in these patients. Recent studies have also shown that when used in preclinical asymptomatic cases of either dilated cardiomyopathy in Doberman pinschers or valvular insufficiency, VETMEDIN® significantly delays the onset of clinical signs of congestive heart failure, a first in veterinary cardiology.

SEMINTRA® is the first-ever licensed angiotensin receptor blocker for veterinary use. Specifically designed for cats, SEMINTRA® is the scientifically advanced treatment in one simple solution that safely and effectively harnesses the protective benefits of the cat's renin-angiotensin-aldosterone system to protect kidneys and other key organs. SEMINTRA® is available as 4mg/ml and 10mg/ml oral solution. SEMINTRA® (4mg/ml) was first launched in 2013 for the reduction of proteinuria associated with chronic kidney disease in cats. In 2018, SEMINTRA® (10mg/ml) was launched for the control (US) / treatment (EU) of feline systemic hypertension. It is the first vet-licensed product for feline hypertension in the US.

Since its launch in 2009 PROZINC® has become the proven insulin choice for feline patients and their owners for convenient management of feline diabetes. With the approval of PROZINC® for canine patients, we have the opportunity to become the first-choice solution for successful management of diabetes in both dogs and cats. Large clinical studies in Europe, the US, and Japan have confirmed that the majority of dogs can be managed with one injection of PROZINC® insulin per day – a major breakthrough for dogs, owners, and veterinarians.

Our pet vaccines product portfolio includes the PUREVAX® feline vaccines formulated to provide effective protection without the use of adjuvants. For a more cat-friendly vaccination, PUREVAX® has been launched in reduced 0.5 ml volume in 2021 in the US and France, and in 2022 in Europe. RECOMBITEK® offers a complete line of advanced canine vaccines providing targeted protection through recombinant technology, and RABISIN® and IMRAB® provide trusted vaccines to fight rabies, with decades of proven efficacy and safety.

Indications	Brand Names	Active Ingredients	
Pain and inflammatory diseases	PREVICOX®	 <i>firocoxib</i>	<p>For the relief of pain and inflammation associated with osteoarthritis as well as specific types of post-operative pain in dogs.</p>
Congestive heart failure	VETMEDIN®	 <i>pimobendan</i>	<p>Treatment of canine congestive heart failure originating from dilated cardiomyopathy or valvular insufficiency (mitral and/or tricuspid regurgitation).</p> <p>Treatment of dilated cardiomyopathy in the preclinical stage (asymptomatic with an increase in left ventricular end-systolic and end-diastolic diameter) in Doberman Pinschers.</p> <p>Treatment of dogs with myxomatous mitral valve disease (MMVD) in the preclinical stage (asymptomatic with a systolic mitral murmur and evidence of increased heart size) to delay the onset of clinical symptoms of heart failure.</p>
Chronic kidney disease (CKD) in cats Hypertension in cats	SEMINTRA®	 <i>telmisartan</i>	<p>Management of chronic kidney disease (CKD) and feline systemic hypertension (US and EU) in cats.</p>
Diabetes	PROZINC®	 <i>protamine zinc</i>	<p>For the treatment of diabetes mellitus in cats and dogs to achieve reduction of hyperglycemia and improvement of associated clinical signs.</p>
Feline vaccines portfolio	PUREVAX®	 <i>feline herpes virus, feline calicivirus, feline panleukopenia virus, chlamydia felis, recombinant vectored feline, leukemia virus, recombinant vectored rabies virus</i>	<p>PUREVAX® is the only fully adjuvant-free feline vaccine range and leverages its innovative canarypox technology for FeLV and rabies. It also offers sustained protection on rabies for up to three years.</p>
Canine vaccines portfolio	RECOMBITEK®**	 <i>recombinant vectored canine, distemper virus, canine parvovirus, canine adenovirus type 2, canine parainfluenza virus, canine coronavirus, leptospira Canicola, leptospira grippotyphosa, leptospira icterohaemorrhagiae, leptospira Pomona, recombinant borrelia burgdorferi, bordetella bronchiseptica</i>	<p>RECOMBITEK® features a complete line of canine vaccines including:</p> <p>RECOMBITEK® Lyme: The only vaccine that contains OspA in a non-adjuvant formulation.</p> <p>RECOMBITEK® oral bordetella: Effective and safe protection made easy.</p>
Rabies vaccines portfolio	RABISIN® IMRAB®	 <i>inactivated and adjuvanted rabies glycoproteins</i>	<p>Sustained rabies protection up to three years after first year booster. Consistently high seroconversion rate. Rabies protection for six species.</p>

* In the US and others.

Companion Animals – Horses

Our equine portfolio is highly comprehensive, covering the key aspects of equine health, including parasite control, vaccination, and the management of chronic diseases. We have a range of flagship and market leading equine products and have recently enhanced our joint disease and respiratory portfolios with the addition of new innovative products. We also have a line of nutraceuticals which can be bought without prescription.

PRASCEND® is indicated for the treatment of pituitary pars intermedia dysfunction (PPID), which is also known as equine Cushing's disease. Clinical signs of PPID are hypertrichiosis, laminitis, change in body conformation and lack of performance. Treatment with PRASCEND® is life-long.

VETERA® vaccines are the first US vaccine portfolio to include multiple convenient combinations of disease protection for horses from as young as four months of age. The vaccines protect against as many as nine infectious organisms including influenza, herpes, the West Nile virus, tetanus and others. This enables customized protection for each horse with limited needle injections.

GASTROGARD®/ULCERGARD® is indicated for the treatment and prevention of equine gastric ulcers, which is one of the most common diseases in horses. GASTROGARD® is supplied in an easy-to-use oral paste form and has been the first choice for treatment of gastric ulcers since its launch in 1999. ULCERGARD® in the US is the preventive of choice for horses with an increased risk of developing gastric ulcers.

EQVALAN®/ZIMECTERIN® contains ivermectin, a leading ingredient that controls a wide variety of important internal parasites, including bots and benzimidazole-resistant small strongyles, in an easy-to-administer oral paste. EQVALAN®/ZIMECTERIN® is approved for adult horses and foals as young as six weeks of age.

ARTI-CELL® FORTE is the world's first licensed veterinary stem cell product which is a ready-to-use intra-articular injection of chondrogenic induced mesenchymal cells for the treatment of lameness linked to non-infective joint inflammation in horses.

RENTEND® is the first product licensed to improve healing of tendon and suspensory ligament injuries in horses. RENTEND® is a targeted stem cell treatment with proven efficacy and repeatable results. It is administered by intraleisional injection and improves the quality of tendon healing by promoting parallel alignment of the right type of fibres and decreases the amount of scar tissue formed.

ASERVO® EQUIHALER® is the first inhalation product for the treatment of severe equine asthma. This product is a novel glucocorticoid pro-drug (ciclesonide inhalation solution) delivered in an inhaler specifically designed for use in horses, and implementing the Soft Mist™ technology derived from the RESPIMAT® inhalers in human pharma. This exciting new introduction gained final authorization and product availability in the EU, US and Canada in 2020.

Indications	Brand Names	Active Ingredients	
Pituitary pars intermedia dysfunction (PPID)	PRASCEND®	<i>pergolide mesylate</i>	 <p>Symptomatic treatment of clinical signs associated with pituitary pars intermedia dysfunction (PPID, also known as equine Cushing's disease).</p>
Combination vaccine against up to nine common diseases in horses	VETERA®	<i>Eastern, Western and Venezuelan encephalomyelitis, tetanus, West Nile virus, equine herpes virus, equine influenza viruses</i>	 <p>For vaccination of healthy horses as an aid in the prevention of diseases caused by the included antigens (US and Canada only).</p>
Equine gastric ulcers	GASTROGARD® ULCERGARD®	<i>omeprazole</i>	 <p>For treatment and prevention of gastric ulcers and prevention of recurrence of gastric ulcers in horses and foals four weeks of age and older.</p>
Internal parasites	EQVALAN® ZIMECTERIN® EQVALAN® GOLD EQVALAN® DUO ZIMECTERIN® GOLD	<i>ivermectin ivermectin, praziquantel</i>	 <p>For treatment and prevention of parasitic infestations in horses and donkeys due to large and small strongyles, ascarids.</p> <p>GOLD/DUO includes treatment against tapeworms.</p>
Reduction of mild to moderate recurrent lameness associated with non-septic joint inflammation in horses	ARTI-CELL® FORTE	<i>chondrogenic induced equine allogeneic peripheral blood-derived mesenchymal stem cells</i>	 <p>For treatment of mild to moderate lameness linked to non-infective joint inflammation in horses. It contains stem cells which are obtained from equine blood. ARTI-CELL FORTE® helps improve the healing of cartilage through increased matrix production and reduces joint inflammation.</p>
EU: improve healing of tendon and suspensory ligament injuries in horses GB: restore fibre alignment in horses with superficial digital flexor tendon or suspensory ligament fibre disruption	RENUTEND®	<i>Tenogenic primed equine allogeneic peripheral blood-derived mesenchymal stem cells (tpMSCs)</i>	 <p>To improve healing of tendon and suspensory ligament injuries in horses. RENUTEND® is a targeted stem cell treatment with proven efficacy and repeatable results. It is administered by intralesional injection and improves the quality of tendon healing by promoting parallel alignment of the right type of fibres and decreases the amount of scar tissue formed.</p>
Severe equine asthma	ASERVO® EQUIHALER®	<i>ciclesonide inhalation solution</i>	 <p>For the alleviation of clinical symptoms of severe equine asthma characterized by coughing, nasal discharge, nasal flaring, increased breathing effort at rest, or abnormal lung sounds.</p>

Livestock – Swine

Infectious respiratory diseases

INGELVAC CIRCOFLEX® is the first single-dose piglet vaccine for the control of porcine circovirus disease (PCVD). INGELVAC CIRCOFLEX® contains IMPRANFLEX® adjuvant which allows for fresh mixing with INGELVAC MYCOFLEX® to form FLEXCOMBO® with the TwistPak system. Our INGELVAC® PRRS products are licensed for active immunization against the respiratory and reproductive form of porcine reproductive and respiratory syndrome (PRRS).

Infectious enteric diseases

ENTERISOL® ILEITIS is the first and only oral live vaccine against ileitis, globally the most prevalent enteric disease in swine caused by *Lawsonia intracellularis*. It is licensed to improve weight gain and to reduce growth variability associated with the disease. ENTERISOL® ILEITIS helps to reduce the total antimicrobial use in pork production.

Integrated Health Management (IHM)

With FARMERA® and SOUNDTALKS™ we will empower pig producers, breeders, retailers, and consumers to improve health, animal welfare, and efficiency by giving insights, predictions, and recommendations through our IHM solutions.

Indications	Brand Names	Active Ingredients
Infectious respiratory diseases	INGELVAC CIRCOFLEX®	 <p><i>recombinant vaccine (porcine circovirus type 2, PCV2)</i></p> <p>For the active immunization of pigs over the age of two weeks against porcine circovirus type 2 to reduce mortality, clinical signs – including weight loss – and lesions in lymphoid tissues associated with porcine circovirus diseases (PCVD). In addition, vaccination has been shown to reduce PCV 2 nasal shedding, viral load in blood and lymphoid tissues, and duration of viremia.</p>
Infectious respiratory diseases	INGELVAC® PRRS MLV INGELVAC PRRSFLEX® EU REPROCYC® PRRS EU	 <p><i>attenuated live vaccine (PRRS virus type 2, type 1)</i></p> <p>Depending on the product, for the active immunization of pigs at various ages against porcine reproductive and respiratory syndrome virus (PRRS).</p>
Infectious respiratory diseases	INGELVAC MYCOFLEX®	 <p><i>inactivated vaccine (Mycoplasma hyopneumoniae)</i></p> <p>For the active immunization of pigs from the age of three weeks to reduce lung lesions following infections with Mycoplasma hyopneumoniae.</p>
Infectious enteric disease	ENTERISOL® ILEITIS	 <p><i>attenuated live vaccine (Lawsonia intracellularis)</i></p> <p>For the active immunization of pigs from the age of three weeks against intestinal lesions caused by Lawsonia intracellularis infection and to reduce growth variability and loss of weight gain associated with the disease.</p>
Respiratory diseases	SOUNDTALKS™*	 <p><i>sound monitors, gateways and algorithms</i></p> <p>SOUNDTALKS™ is sound monitoring technology that detects early symptoms of respiratory distress in swine thanks to its 24/7 monitoring and algorithms.</p>
Data capture forms and tools	FARMERA®	 <p><i>mobile app. Digital data management and communication platform for swine production</i></p> <p>FARMERA® allows being more efficient, effective, and proactive by enabling evidence-based decision making with real-time information when managing health and production in production companies.</p>

* SOUNDTALKS™ is a trademark of SoundTalks, N.V.

Livestock – Cattle/Ruminants

Our cattle/ruminants business is a global leader in anti-parasitic brands such as IVOMEC®, LONGRANGE® and EPRINEX®. These world renowned parasiticides treat and protect grazing animals from the harmful effects of internal and external parasites.

ZACTRAN® treats cattle with bacterial pneumonia and sheep with digital dermatitis infections.

BOVELA® is for active immunization of cattle of three months of age in terms of reproductive infectious diseases.

Indications	Brand Names	Active Ingredients
Internal and external parasites of cattle	IVOMEC®	 <p><i>ivermectin</i></p> <p>Depending on formulation, the product is for the treatment of nematodes, lice, mites, ticks, flies, lungworms and liver flukes.</p>
Internal and external parasites of cattle	LONGRANGE®	 <p><i>eprinomectin, long-acting</i></p> <p>The Theraphase® technology used to develop this formulation of eprinomectin allows a single treatment to last up to 100-150 days – long enough to break the parasite life cycle and effectively reduce parasite burdens on the pasture. LONGRANGE® is effective in the control of most internal and external parasites of cattle: gastrointestinal roundworms, lungworms, grubs, mites.</p>
Internal and external parasites of ruminants	EPRINEX®	 <p><i>eprinomectin</i></p> <p>Depending on formulation, the product is for the treatment of nematodes, lice, mites, ticks, flies and lungworms in cattle and sheep.</p>
Bacterial causes of respiratory disease and interdigital dermatitis (footrot)	ZACTRAN®	 <p><i>gamithromycin</i></p> <p>Depending on species indication (and country of registration), the product is for the treatment and metaphylaxis control of respiratory disease in cattle caused by key bacteria (Mannheimia, Pasteurella, Histophilus and Mycoplasma) and footrot disease in sheep caused by key bacteria (Fusobacterium and Dichelobacter).</p>
Reproductive infectious diseases in cattle	BOVELA®	 <p><i>bovine viral diarrhoea (BVD) types 1 and 2</i></p> <p>Reduces hyperthermia and minimizes the reduction of leukocyte count caused by bovine viral diarrhoea virus (BVDV-1 and BVDV-2); reduces virus shedding and viremia caused by BVDV-2 and prevents the birth of persistently infected calves caused by transplacental infection.</p>

Livestock - Cattle/Ruminants (continued)

Our vaccine PYRAMID®/PRESPONSE® is part of our expanding portfolio of respiratory and reproductive vaccines to prevent diseases that affect livestock.

METACAM® is a non-steroidal anti-inflammatory drug (NSAID), helping to minimize losses from inflammation and tissue damage in animals suffering from disease, hence addressing the need for maintained profitability and the concern for farm animal well-being.

Indications	Brand Names	Active Ingredients
Infectious respiratory diseases and reproductive disorders in cattle	PYRAMID® PRESERVE®	<div data-bbox="751 285 935 400" data-label="Image"> </div> <p data-bbox="683 442 1011 715"><i>family of multivalent vaccine combinations including different modified live viruses: bovine viral diarrhoea (BVD) types 1 and 2, infectious bovine rhinotracheitis (IBR), parainfluenza 3 (PI3) and bovine respiratory syncytial virus (BRSV), and bacteria: Pasteurella multocida, Mannheimia haemolytica, L. canicola, L. grippotyphosa, L. hardjo, L. icterohaemorrhagiae and L. pomona</i></p> <p data-bbox="1027 470 1436 640">The PYRAMID®/PRESERVE® family of vaccines provides broad coverage for BVD types 1 and 2, IBR, BRSV, PI3 and Mannheimia haemolytica with only a single dose. They contain the MetaStim** adjuvant system to enhance the animal's response for greater protection (US and Canada only).</p> <p data-bbox="1027 661 1382 715">* MetaStim® is a registered trademark of Zoetis Services LLC</p>
Pain and inflammatory disorders	METACAM®	<div data-bbox="820 740 911 895" data-label="Image"> </div> <p data-bbox="683 923 788 949"><i>meloxicam</i></p> <p data-bbox="1027 825 1436 949">For the treatment of mastitis in lactating cows and for the control of pain associated with dehorning or surgery. It is also indicated for use in calves affected by diarrhoea and in cattle suffering from respiratory disease.</p>

Livestock - Poultry

Our poultry vaccine portfolio consists of a wide range of classical live and vector vaccines as well as inactivated vaccines for broilers, laying and brood hens that provide protection against acute viral and bacterial diseases such as avian influenza, infectious bronchitis, Newcastle disease, infectious bursitis, egg drop syndrome, salmonella, laryngotracheitis, avian rhinotracheitis and coryza. This portfolio of preventive products enables poultry farmers worldwide to contribute to feed the growing global population with safe, affordable and sustainable poultry meat and eggs.

Indications	Brand Names	Active Ingredients
Various viral and bacterial diseases in poultry	GALLIMUNE® GALLIVAC® VOLVAC®	 <p><i>Live attenuated and inactivated monovalent or polyvalent vaccine containing antigens for vaccination against avian influenza, Newcastle disease, egg drop syndrome, infectious bronchitis, infectious bursitis, avian rhinotracheitis, salmonella and coryza</i></p> <p>To vaccinate healthy chickens against diseases caused by the antigens they contain. To prevent the most common diseases in chickens for fattening and diseases which lead to a decline in egg production in laying hens and breeder flocks.</p>
Infectious Bursitis (IBD), Marek Disease (MD) and Newcastle Disease (ND) or Infectious Laryngotracheitis (ILT)	VAXXITEK® HVT + IBD VAXXITEK® HVT + IBD + ND VAXXITEK® HVT + IBD + ILT	 <p><i>Serotype 3, live vector of Marek disease, recombinant vHVT013-69 live virus containing a gene of the IBD virus and, in the case of trivalent vaccines, a gene of the IBD virus and the ND or ILT virus (and thinners)</i></p> <p>The vaccination of 18-to-19-day old embryos and one day old chickens is effective against the standard diseases and variants of infectious bursitis, Marek disease. The vaccination with a trivalent vaccine also confers protection against Newcastle disease or infectious laryngotracheitis.</p>
Newcastle Disease	AVINEW®	 <p><i>Newcastle disease live virus, VG/GA AVINEW strain</i></p> <p>In chickens for fattening from one day of age: active immunization against Newcastle disease to reduce mortality and clinical signs associated with the disease. For future laying and breeding hens from the age of four weeks: active immunization against Newcastle disease.</p>
Marek Disease	PREVEXXION® RNPREVEXXION® RN+HVT PREVEXXION® RN+HVT+IBD PREVEXXION®RN & VAXXITEK® HVT+IBD	 <p><i>Live herpesvirus chimera, serotype 1, strain RN1250 (and thinner)</i></p> <p>Vaccination of 18-to-19-day old embryos and / or one-day-old chickens is recommended to protect against any type of Marek disease virus, including the very virulent ones.</p>
Newcastle and Marek Disease	NEWXXITEK™ HVT + ND	 <p><i>Live Marek disease virus, serotype 3, containing a Newcastle disease gene insert (and thinner)</i></p> <p>The vaccination of 18-to-19-day old embryos or one-day-old chickens is effective against Marek and Newcastle disease.</p>
Avian Influenza	GALLIMUNE H9+ND VOLVAC B.E.S.T AI+ND TROVAC PRIME 7 & TROVAC H5	 <p><i>Inactivated vaccine against H9N2 Inactivated recombinant vaccine containing avian influenza H5 subunit. Fowl pox vectors expressing avian influenza H7 or H5</i></p> <p>In broilers, layers and breeders, active immunization against the different types of avian influenza viruses: H9, H5 and H7. The range is adapted to local / regional virus variations.</p>

Veterinary Public Health (VPH)

Boehringer Ingelheim is the trusted partner of governments and international organizations charged with protecting veterinary public health and the global and national agricultural communities. Our knowledge, experience, and technology make us a unique partner.

We are pioneers and innovators in veterinary public health, always considering people, animals, and environment in a one-health approach. For more than 70 years, we have helped communities fight disease, protect animal health and livelihoods. We do this through planning and vaccine supply to national and regional disease control programs, vaccine and antigen banks for outbreak preparedness, and manufacturing partnerships that build capacity in developing countries.

Foot-and-mouth disease (FMD) is the most important viral disease of swine and ruminants impacting global trade and food security of meat and milk supply. FMD has been identified as a key barrier to countries achieving some of

their Sustainable Development Goals (SDGs). Our FMD vaccines portfolio including AFTOPOR[®], AFTOVAXPUR[®] and AFTOVAX[®] provides active immunization of cattle, sheep or pigs to reduce clinical signs and mortality following exposure to FMD virus. Vaccines are multi-strain, tailored to evolving local epidemiology.

Rabies kills 60,000 people a year, mostly children. The disease is almost entirely preventable through dog vaccination, and control in wildlife reservoirs. RABISIN[®] is an inactivated vaccine against rabies, available as a clear colourless suspension for injection. RABORAL[®] is an oral recombinant vaccine that protects wildlife against rabies.

Bluetongue Virus (BTV) causes global disease of cattle and sheep, and new strains continue to cross the Mediterranean into Europe. BTVPUR[®] is a multi-strain vaccine used for active immunization of sheep and cattle to prevent viremia and to reduce clinical signs caused by bluetongue virus.

Indications	Brand Names	Active Ingredients
Foot-and-mouth disease (FMD)	AFTOPOR® AFTOVAXPUR® AFTOVAX®	 <p>AFTOPOR and AFTOVAXPUR are safe and highly potent vaccines with purified antigens, recommended in endemic or emergency situations. Both have potential marker properties that allow differentiation between infected and vaccinated animals (DIVA).</p> <p>AFTOVAX is an effective vaccine for cattle and sheep, suitable for mass vaccination in endemic situations.</p> <p><i>Mix of inactivated FMD virus antigens</i></p>
Rabies	RABISIN® RABORAL V-RG®	 <p>RABISIN® is used for the active immunization of dogs and cats to reduce mortality and clinical signs due to rabies infection. Immunity has been demonstrated one month after vaccination and has been shown to persist up to 1 year after primary vaccination, and up to 3 years following booster vaccination.</p> <p>RABORAL V-RG® is an oral rabies recombinant vaccine that protects wildlife (raccoons, foxes and coyotes) against rabies, thereby reducing the risk of exposure to rabies for humans and domestic animals. It is only sold to government agencies conducting rabies control programs.</p> <p><i>Rabisin: inactivated and adjuvanted rabies virus; Raboral V-RG: vaccinia-vectored rabies vaccine</i></p>
Bluetongue	BTVPUR®	 <p>BTVPUR allows for active immunization of sheep to prevent viremia and to reduce clinical signs caused by bluetongue virus serotypes 1, 2, 4 and / or 8 (combination of maximum 2 serotypes).</p> <p>Active immunization of cattle to prevent viremia caused by bluetongue virus serotypes 1, 2, 4 and / or 8, and to reduce clinical signs caused by bluetongue virus serotypes 1, 4 and / or 8 (combination of maximum 2 serotypes).</p> <p>Onset of immunity has been demonstrated three weeks (or five weeks in sheep for BTV-2) after the primary vaccination course for BTV-1, BTV-2 (cattle), BTV-4 and BTV-8 serotypes.</p> <p><i>Mix of inactivated bluetongue virus</i></p>

