This animal model is quite robust to predict blood lowering capabilities of antihypertensive agents in patients.

Recently, Kolkhof et al. investigated the tissue distribution and chronic cardiorenal end-organ protection of finerenone, a nonsteroidal MR antagonist (MRA), in comparison to the steroidal MRA eplerenone in different preclinical rat disease models (Kolkhof et al. 2014). Finerenone treatment prevented in DOCA-salt challenged rats from functional as well as structural heart and kidney damage at dosages not reducing systemic blood pressure. Furthermore, finerenone reduced cardiac hypertrophy, plasma prohormone of brain natriuretic peptide (pro-BNP), and proteinuria more efficiently than eplerenone when comparing equi-natriuretic (i.e., an indirect measure of anti-kaliuretic) doses. Based on these preclinical investigations, finerenone may offer end-organ protection with a reduced risk of electrolyte disturbances compared with steroidal MRAs in patients with chronic heart and kidney diseases (Bauersachs 2013). Accordingly, finerenone was investigated in a multicenter, randomized, double-blind, placebo-controlled, parallel-group clinical phase II study called "ARTS" (MinerAlocorticoid Receptor Antagonist Tolerability Study) among patients with heart failure with reduced left ventricular ejection fraction (HFrEF) and chronic kidney disease (Pitt et al. 2012). In these patients, 5 and 10 mg/day of finerenone was at least as effective as spironolactone 25 or 50 mg/day in decreasing BNP, NT-pro-BNP, and urinary albumin, but it was associated with lower increases in serum potassium, lower incidences of hyperkalemia, and worsening of renal function (Pitt et al. 2013).

In summary, the novel nonsteroidal MRA finerenone demonstrated higher efficacy with respect to end-organ protection when comparing equi-efficient natriuretic (anti-kaliuretic) doses of a steroidal MRA in chronic preclinical models of heart failure. Finerenone demonstrated comparable efficacy to a steroidal MRA in patients with HFrEF and CKD with significantly lower incidences of dangerous hyperkalemia and renal failure.

2.4 Pulmonary Hypertension

Pulmonary hypertension (PH) is a severe, progressive, life-changing and life-threatening disorder of the heart and lungs, characterized by increased blood pressure in the pulmonary arteries (PAs) that can lead to heart failure and death. Patients with PH develop a markedly decreased exercise capacity and a reduced quality of life. The most common symptoms of PH include shortness of breath, fatigue, dizziness, and fainting, all of which are worsened by exercise. PH is clinically categorized into five groups depending on clinical presentation, etiology, and therapeutic approach (Simonneau et al. 2013; Galiè et al. 2009). Early diagnosis and accurate identification of the PH group are essential, as a delay in treatment initiation can have a negative impact on survival. Continuous treatment monitoring is then vital to ensure that patients are receiving optimal care for their particular group and stage of disease.