Multifactorial diseases like hypertension or metabolic syndrome are significant causes of morbidity and mortality. The metabolic syndrome is mostly characterized by resistance to insulin effect, impairment of lipid metabolism and inclination to hypertension and obesity. Essential hypertension which is the part of the metabolic syndrome is widely spread all over the world and presents the main risk factor for coronary diseases, kidney failure, and stroke. Inbred animal models can be used for identification of the genetic component of complex diseases. The most studied model of metabolic syndrome and essential hypertension is the spontaneously hypertensive rat (SHR), which has proven to be a valuable tool for studying the pharmacological and physiological aspects of blood pressure regulation. There has been significant progress during the last decades in genetic mapping of hypertension and other complex traits in rat models, including SHR. Many of these quantitative trait loci – QTLs are involved in pathogenesis of spontaneous hypertension with the effect on the blood pressure variation about 10-20 mmHg. One QTL involved in blood pressure regulation is located on the rat 8th chromosome. This QTL has been confirmed by the congenic strain SHR-Lx. In this strain the 7-gene 788 kb segment of chromosome 8 of SHR origin has been substituted by the sequence of PD origin (inbred strain PD has normal blood pressure). SHR-Lx showed significant decrease of blood pressure and heart weight compared to SHR.