

Animal Model

Renin Transgenic Rat TGR(mREN2)27

Reference Number 03-00202

Abstract

Challenge

Hypertension is a widely spread disease responsible for up to 50% of all deaths in the industrialised countries. The most important regulator of blood pressure is the renin angiotensin system (RAS). Besides its function to regulate the blood pressure, it is involved in salt retention in kidney, stimulation of aldosterone synthesis in the adrenal gland, and regulation of the sympathetic tone. The rate limiting enzyme of the system is renin, which is responsible for the cleavage of angiotensinogen, yielding the inactive angiotensin I (Ang I). This peptide itself is further processed to the biologically active Ang II. Any deregulation of this sensitive system leads to interferences in the whole cardiovascular system and to hypertension. Subsequently, end-organ damage, cardiac and renal failure and stroke may occur. To understand the detailed processes causing not only the malfunction of the RAS system itself but also the involvement of Ang II and aldosterone in the adverse effects, there is a strong demand for an animal model allowing the study of the system.

Technology

To investigate the RAS system, a transgenic rat has been generated harbouring an additional mouse renin-2 gene, TGR(mREN2)27. These rats produce high amounts of renin, which subsequently results in an increase of Ang II and aldosterone concentrations leading to hypertension followed by organ damage of heart and kidney. Thus this animal model provides an ideal system to investigate hypertension and its adverse affects.

Commercial Opportunity

Breeding pairs of TGR(mREN2)27 are available under a Tangible Property License Agreement.

Further Reading

- Mullins et al., 1990, Nature, 344, 541-544.
- Lee et al., 1996, Am J Physiol. 270, E919-E929