GK 大鼠

品系编号：GAP2020

品系简称：GK

品系特点：

GK 大鼠是非胰岛素依赖非肥胖自发II型糖尿病大鼠模型。主要表现为胰岛功能不足，胰岛β细胞分泌功能受损，空腹高血糖，肝糖原生成增多，肝脏、肌肉和脂肪组织中度胰岛素抵抗，血脂升高，多尿，并出现各种糖尿病并发症，且不伴随肥胖。表现与人类糖尿病相似的代谢、内分泌和血管疾病。雄性动物约在 14~16 周龄时出现 II 型糖尿病，即出现血糖升高、心率降低、心肌萎缩等症状，与人类II型糖尿病心脏病进展极为相似。

遗传学信息：

遗传背景：wistar

品系类型：基因突变

应用领域：

1. 糖尿病发病机制及胰岛素抵抗

2. 糖尿病并发症：与人类疾病相似的视网膜病变、肾病、神经病变和心血管并发症等特征。

表型分析：

1. **生长曲线提示：**雄性体重略低于对照，显示是优秀的非肥胖自发II型糖尿病模型选择

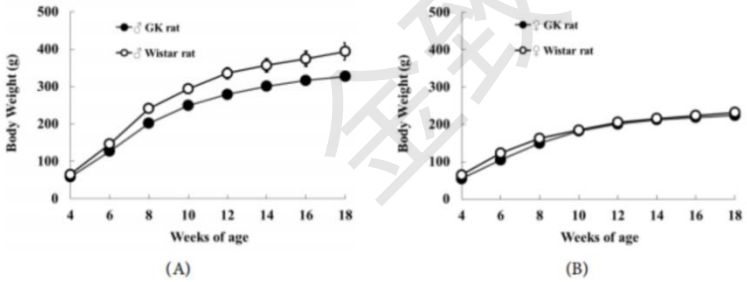

Figure 1. Changes in body weights in GK rats and Wistar rats from 4 to 18 weeks of age. (A) Male GK rats (n = 10) and Wistar rats (n = 30); (B) Female GK rats (n = 10) and Wistar rats (n = 30).

2. 血糖曲线：无论性别，从 4 周-18 周 GK Rats 的血糖明显高于对照组

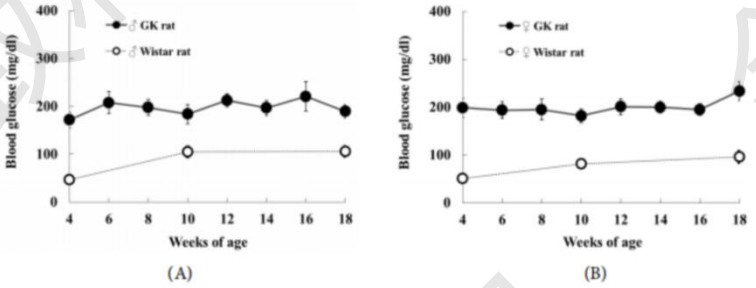

Figure 2. Changes in blood glucose levels in GK rats and Wistar rats from 4 to 18 weeks of age. (A) Male GK rats (n = 10) and Wistar rats (n = 30); (B) Female GK rats (n = 10) and Wistar rats (n = 30).

3. 糖耐受实验：无论性别，GK 大鼠早期胰岛β细胞分泌功能受损

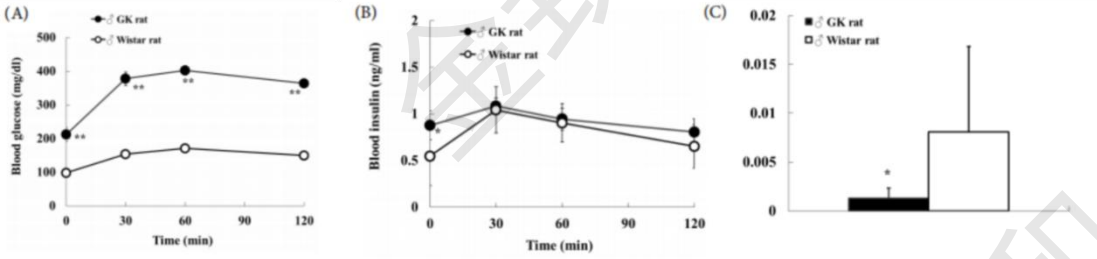

Figure 3. Changes in blood glucose (A) and insulin (B) levels in male glucose-loaded GK rats and Wistar rats at 10 weeks of age; (C) Insulinogenic index in glucose-loaded GK rats and Wistar rats. Insulinogenic index = ΔInsulin (increment from 0 - 30 min)/ΔGlucose (increment from 0 - 30 min). Data represent mean ± standard deviation (n = 10). *P < 0.05, **P < 0.01; significantly different from the Wistar rat.

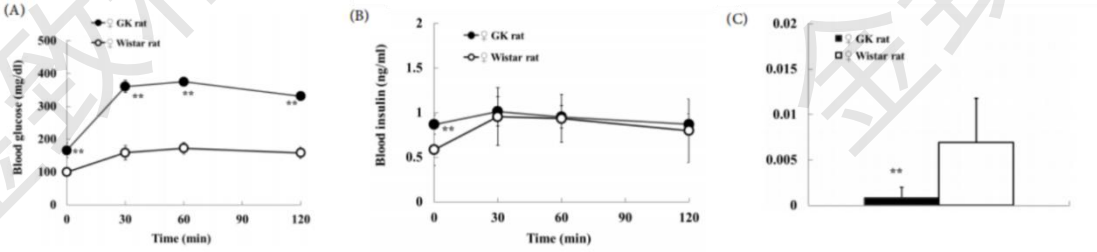

Figure 4. Changes in blood glucose (A) and insulin (B) levels in female glucose-loaded GK rats and Wistar rats at 10 weeks of age; (C) Insulinogenic index in glucose-loaded GK rats and Wistar rats. Data represent mean ± standard deviation (n = 10). *P < 0.05, **P < 0.01; significantly different from the Wistar rat.

参考文献：

1. Yagihashi, S., Goto, Y., Kakizaki, M., et al. “Thickening of glomerular basement membrane in spontaneously diabetic rats”.Diabetologia 15:309-312,1978
2. Yagihashi, S., Tonosaki, A., Yamada, K., et al.”Peripheral neuropathy in selectively-inbred spontaneously diabetic rats: Electrophysiological , morphometrical and freeze-replica studies.” Tohoku J. exp. Med. 138:39-48, 1982.
3. exhibits changes in renal structure and function (Schrivers BF, 2004) (Janssan U, 2004)
4. develops hypertension and cardiac hypertrophy (Grönholm T, 2005) (Fuentes-Antrás J, 2015)
5. exhibits aspects of diabetic retinopathy (Gong C, 2016) (Miyamoto K, 1996)