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WNIN/Ob – a novel versatile rat model of metabolic syndrome

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Abstract

WNIN/Ob rat obese strain which was first identified in our center in 1997 from the inbred Wistar stock (WNIN) emerges as the single most animal model that shows all the attributes of the classical metabolic syndrome. It is the fattest obese rat strain (> 1kg) ever recorded, and has a unique " kinky " tail hitherto not seen in any other model. The strain distinctly show three phenotypes, lean (+/+), carrier (+/-), and obese (-/-), and the mode of inheritance is autosomal incomplete dominance. The (-/-) animals are infertile and the colony is maintained by crossing (+/-) rats which yield the three phenotypes, in a Mendelian ratio of 1: 2: 1. The infertility is reversible in males by restricted feeding.

The colony is in existence for the past 15 years, and is fully characterized with reference to physical , physiological , biochemical and metabolic traits and over thirty papers are published so far using this model. The original WNIN/Ob strain is obese with euglycemia, but a variant of it was obtained subsequently, Viz., WNIN/GR-Ob, which is impaired glucose tolerant (IGT) as well. The latter when maintained on a purified starch/sucrose diet for four months becomes fully diabetic. Both the strains develop tumors, (60%), cataracts and retinal degeneration (20%), hypertension (majority), with low bone density, kidney abnormalities, and dysfunctional immunity as they cross one year and do not survive beyond one and half years. The molecular lesion is traced to a 3 mb polymorphic region on chromosome no 5, and work is currently going on fine mapping of this region.

Biography

Dr NV Giridharan did his Ph.D from Mangalore University in 1987 and visited Europe, US, and Japan as visiting scientist. He was the Head of National center of Laboratory Animal Sciences (NCLAS) a premier Laboratory animal service organization, under Indian council of Medical Research, New Delhi, India. He has published more than 55 papers in reputed journals and serving as a reviewer in couple of International journals of repute. Currently he is working as an Associated Professor at the School of Nanoscience,and Molecular medicine, at Amrita Institute of Medical sciences(AIMS), Kochi, a leading medical institute of international repute.