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ARTICLE[Can J Physiol Pharmacol](#). 2025 Nov 1;103(11):357-368. doi: 10.1139/cjpp-2025-0095.

Epub 2025 Aug 19.

Suppression of protein kinase RNA-like endoplasmic reticulum kinase by probiotics circumvents cardiovascular risk profile in experimentally induced PCOS model

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PMID: 40829189 DOI: [10.1139/cjpp-2025-0095](#)

Abstract

The present study was designed to investigate the role of PERK in CVD risk associated with polycystic ovarian syndrome (PCOS) in experimental rat model, and the therapeutic benefits of probiotics. Eight-weeks-old female Wistar rats were assigned into four groups ($n = 6$): Control (CTRL), Probiotics (PROB), Letrozole (PCOS), and PCOS + PROB. Daily administration of letrozole (1 mg/kg) for 21 days was used to induce PCOS; thereafter, probiotics (3×10^9 CFU) was administered daily for 6 weeks. Biochemical parameters and histological evaluations were performed with appropriate techniques. The present findings revealed that animals with PCOS were characterized with phenotypic features such as hyperandrogenemia and multiple cysts in the ovaries. In addition, PCOS rats manifested insulin resistance and increase in glucose regulatory protein (GRP78), together with increased levels of circulating corticosterone, cardiac triglyceride, inflammatory mediators (NF- κ B and TNF- α), TGF- β 1, Caspase-6, and HDAC2, while a decrease in HIF-1 α and NrF2 was observed when compared with control animals. These were accompanied by elevated level of PERK. However, treatment with probiotics reversed these systemic, endocrine, metabolic, and cardiac anomalies. The present study suggests that probiotics attenuates CVD risk profile in experimental PCOS rat model by suppression of PERK/HDAC2-dependent pathway.

Keywords: PCOS; PERK; cardiovascular disease; histone deacetylase; probiotics.[PubMed Disclaimer](#)

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