



# ANTIOXIDANT ENZYMES ACTIVITIES IN PANCREATIC CARCINOMA AND INFLUENCE OF DIABETES MELLITUS

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## Background

Pancreatic carcinoma (PC) is a tumor disease with high mortality and increasing incidence, ductal adenocarcinoma represents 95 % of all cases. Etiopathogenesis of PC is multifactorial and includes environmental effects (smoking, alcohol, increased consumption of fats, obesity), acquired genetic and non-genetic malfunctions (diabetes) and effect of genetic stress (hereditary pancreatitis); some of the mentioned factors affect antioxidant ability of organism as well [1].

## Aim

The aim of this study was to evaluate the activities of antioxidant enzymes in patients with pancreatic carcinoma (PC) in comparison with healthy controls (CON) and the influence of diabetes mellitus type 2 (DM2) on these activities.

## Methods

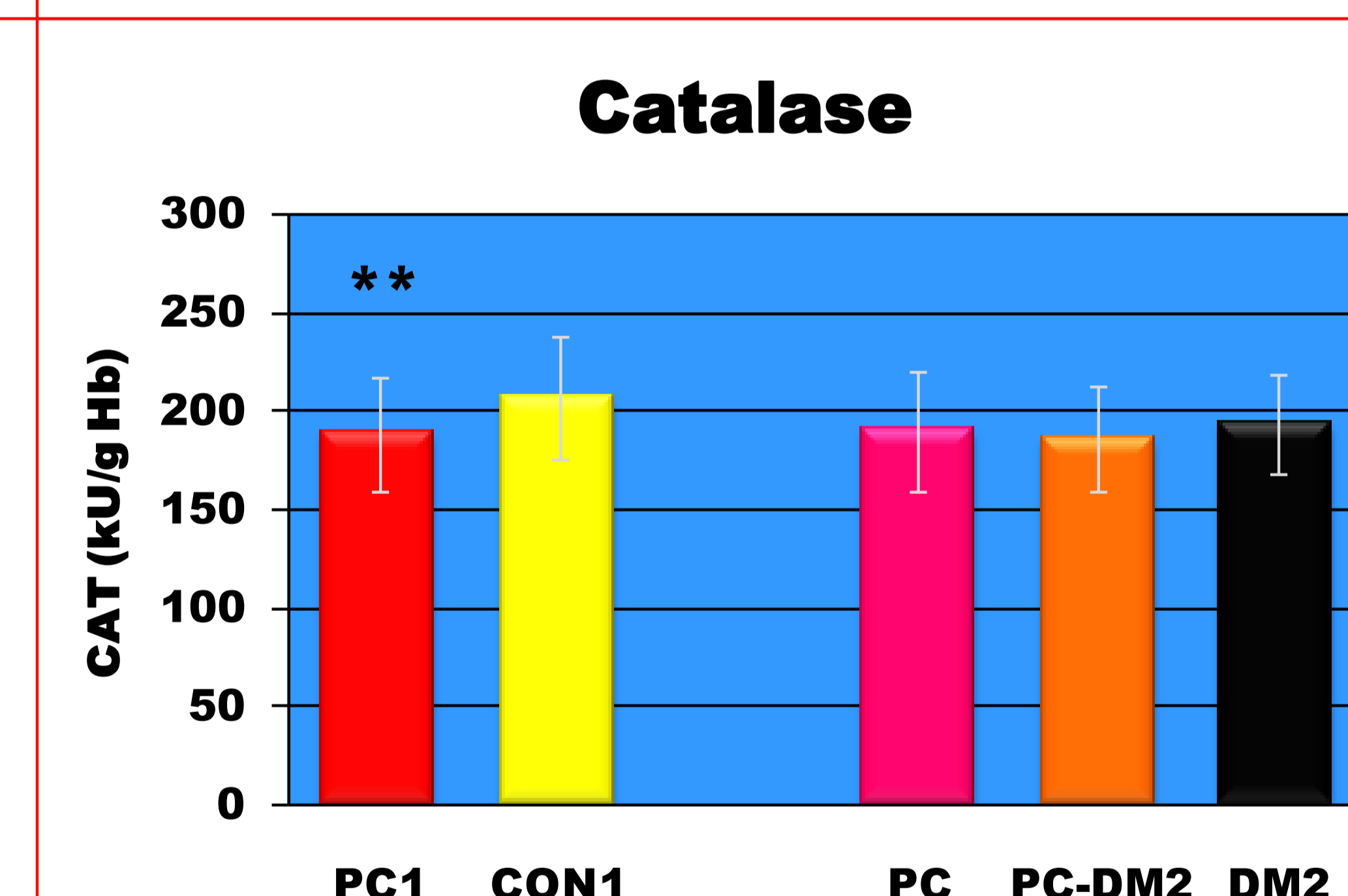
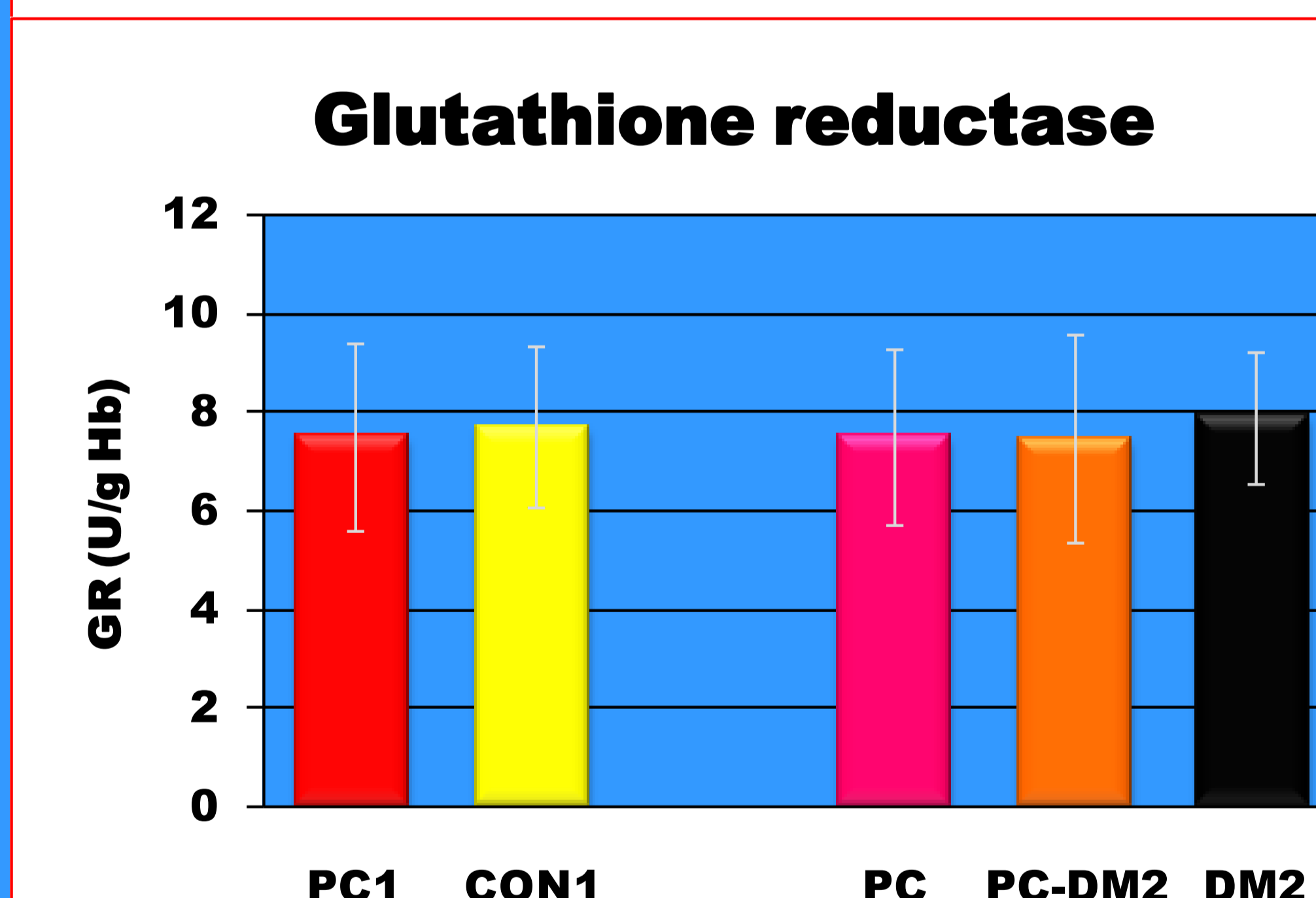
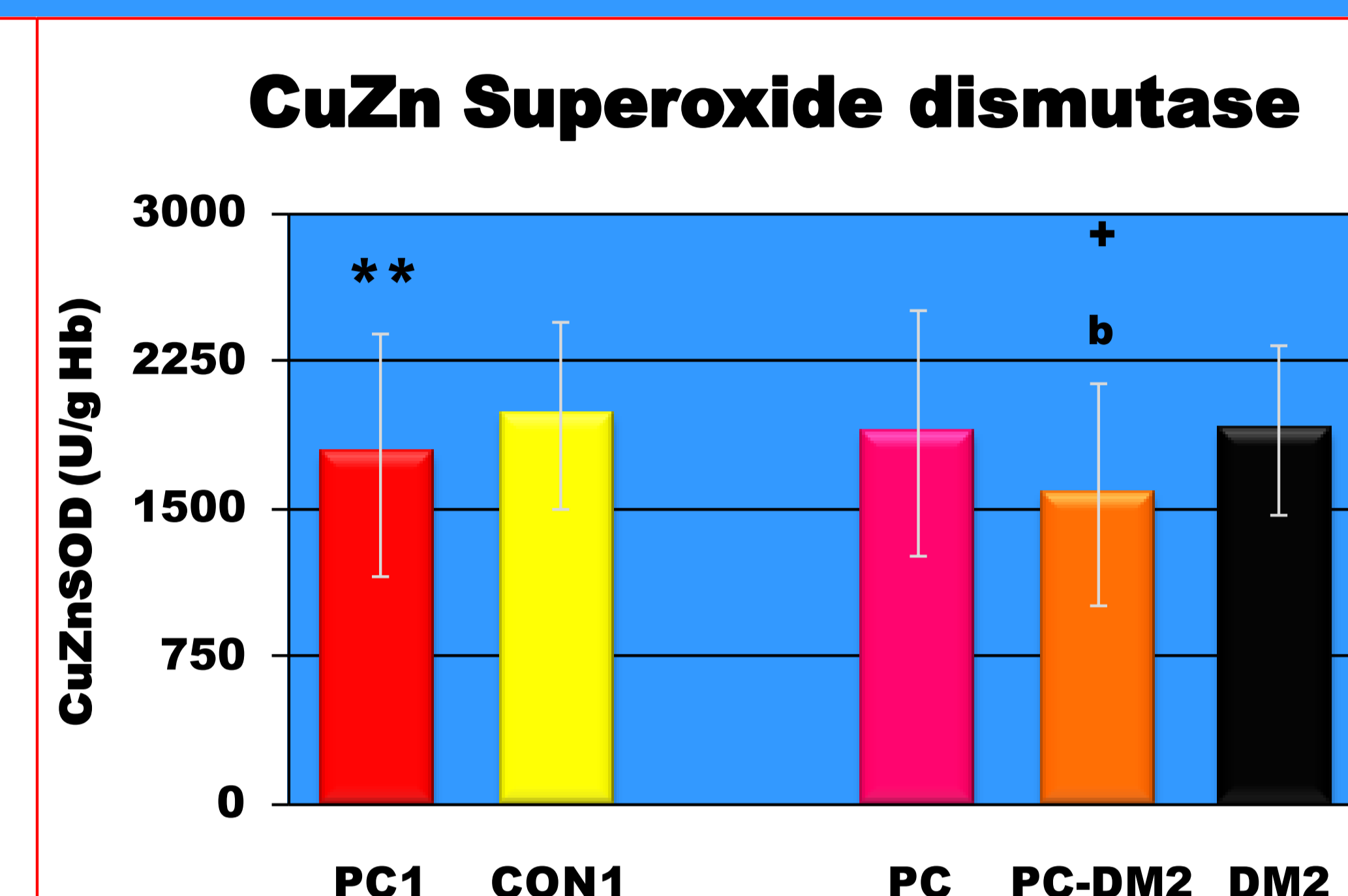
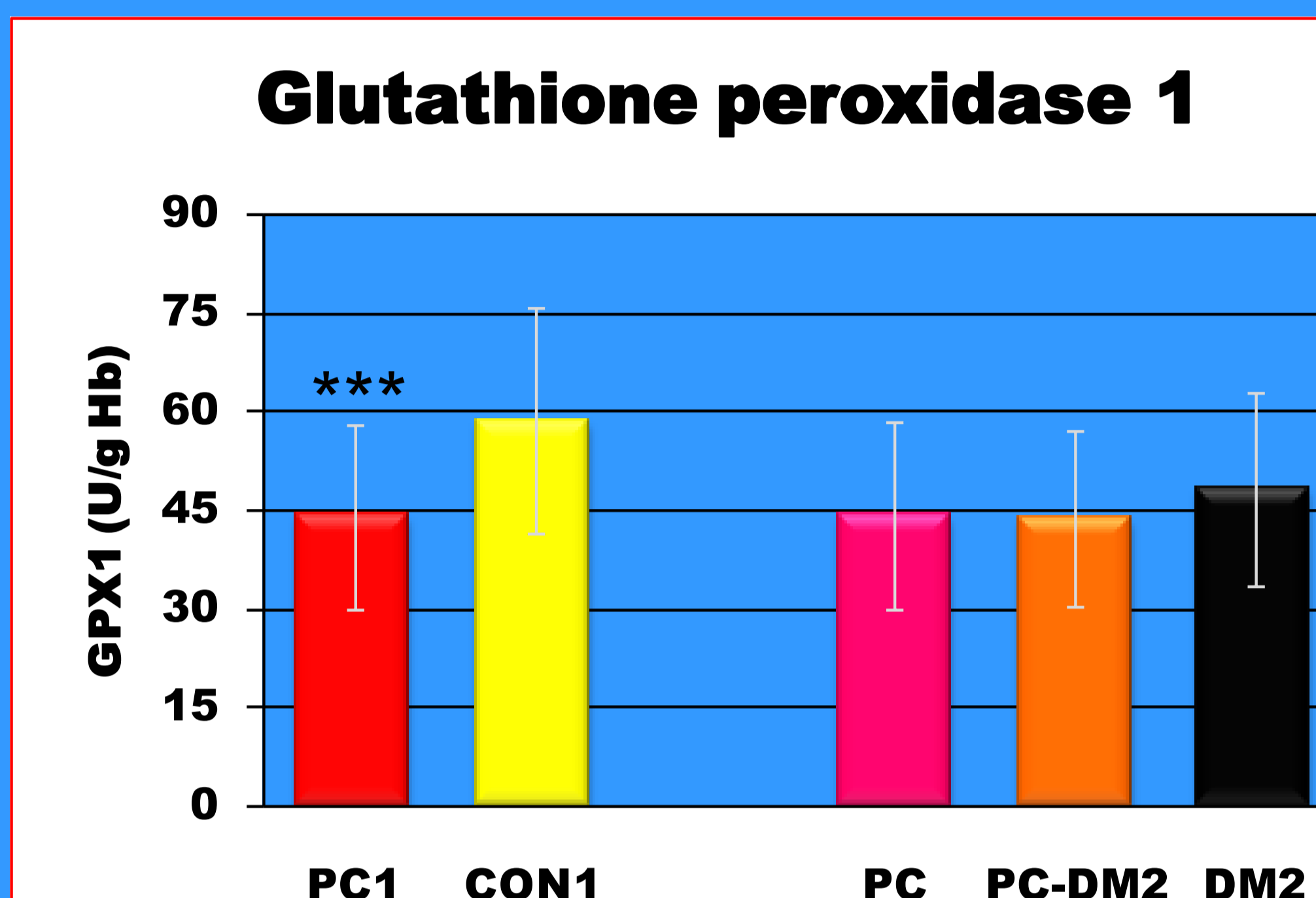
Into our study 60 (M/F = 28/32) patients with PC, 60 sex- and age matched healthy controls (CON) and 21 controls with DM2 were enrolled. The DM2 control group were matched with 21 patients from PC group that suffer from DM2.

The levels of superoxide dismutase (CuZnSOD), catalase (CAT), glutathione peroxidase (GPX1), glutathione reductase (GR) and reduced glutathione (GSH) in erythrocytes and the levels of paraoxonase (PON1) in serum and conjugated dienes in precipitated LDL (CD/LDL) were estimated as previously described [2].

## References

- [1] Bardeesy N, DePinho RA: Pancreatic cancer biology and genetics. Nat Rev Cancer 2002; 2: 897-909.  
[2] Kodydkova J, Vavrova L, Zeman M, et al: Antioxidative enzymes and increased oxidative stress in depressive women. Clin Biochem 2009; 42: 1368-74.

## Results

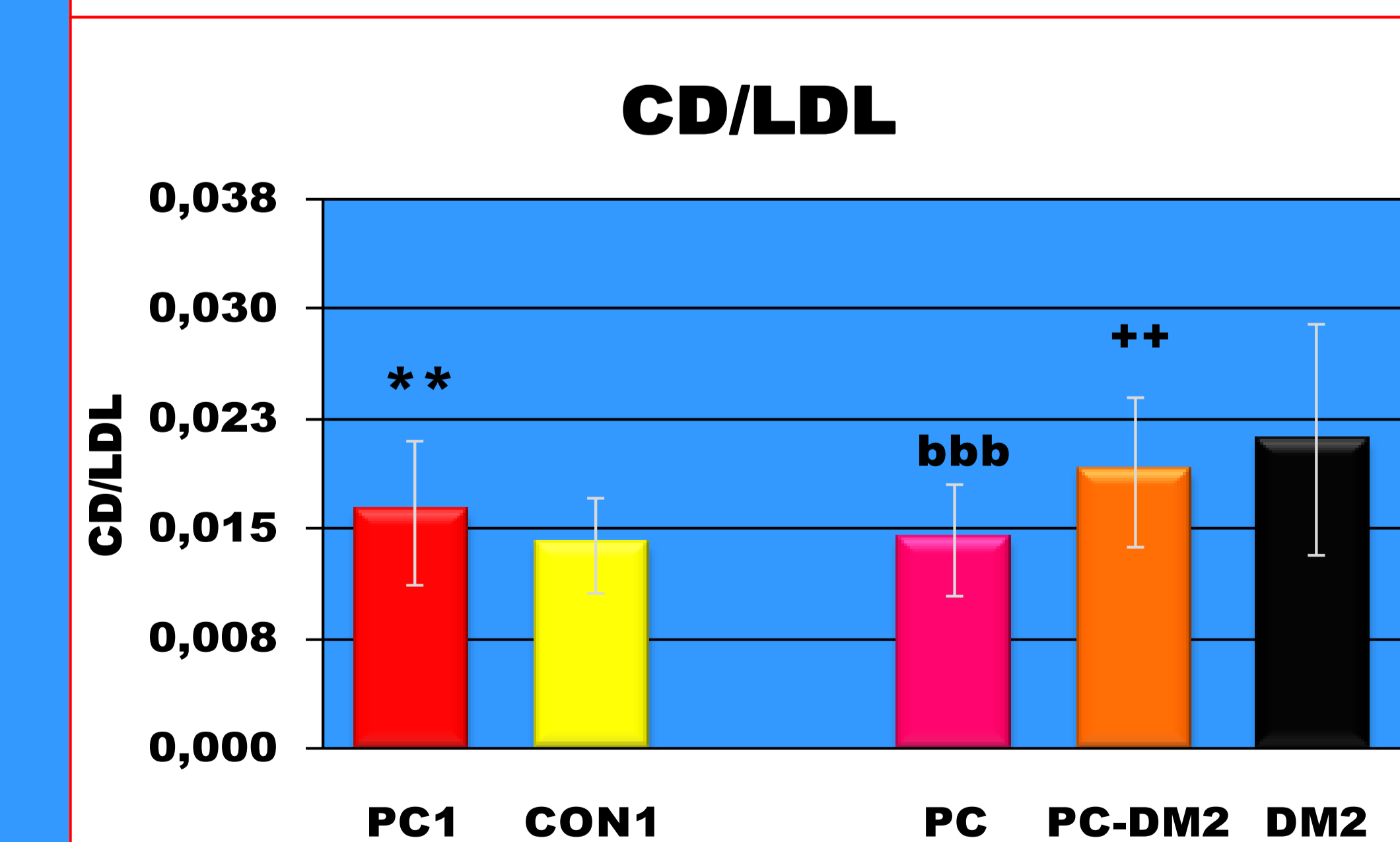
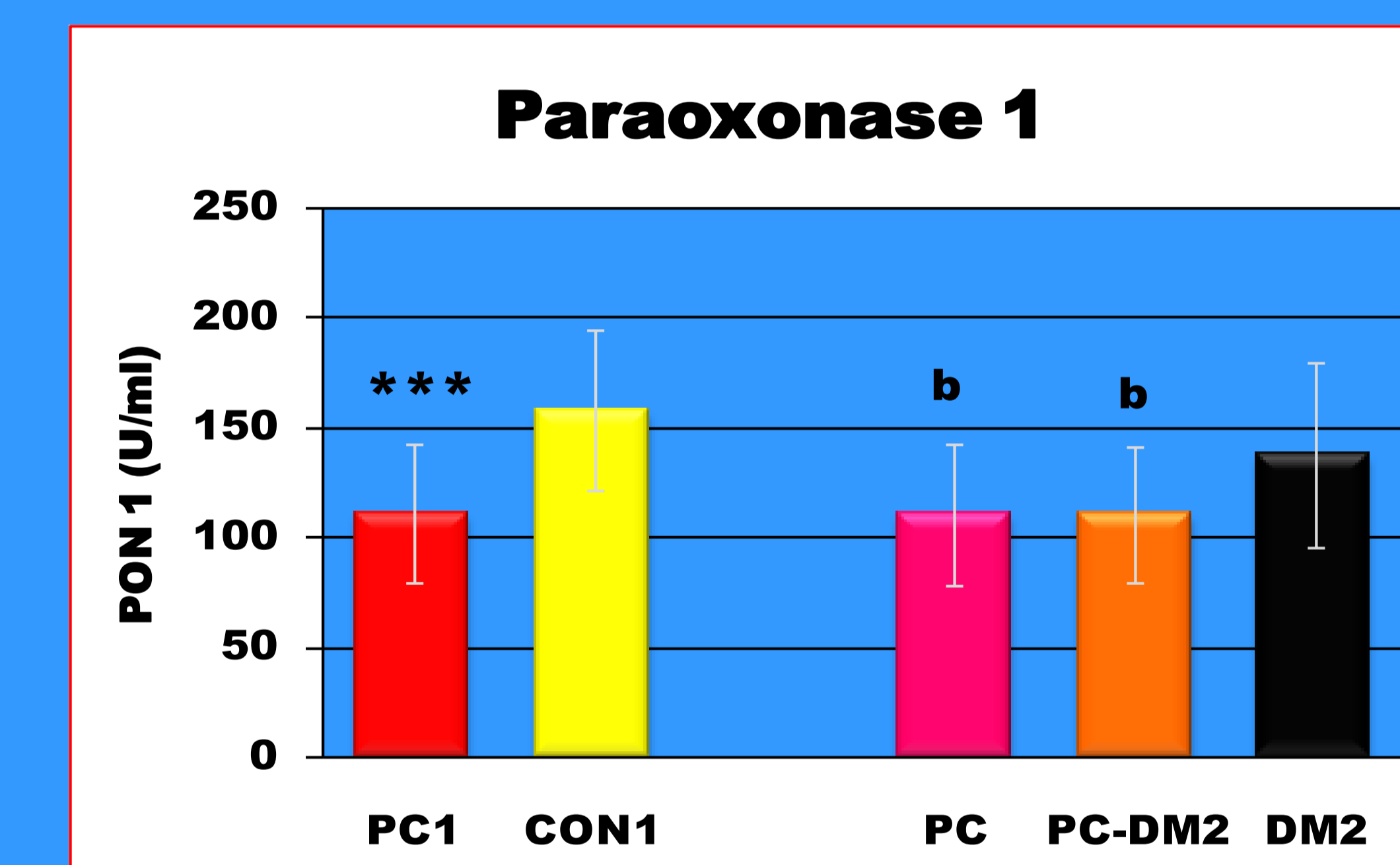


\* PC1 vs. CON1 ; \*\*\*p < 0.001, \*\* p < 0.01, \* p < 0.05  
+ PC vs. PC-DM2; ++ p < 0.01; + p < 0.05  
<sup>b</sup> PC or PC-DM2 vs. DM2; <sup>bbb</sup> p < 0.001, <sup>b</sup> p < 0.05

## Conclusion

The results of our study suggest that free radical activity is enhanced in patients with cancer of pancreas while the antioxidant defense mechanism is weakened. The manifestation of DM2 in PC patients enhances lipid peroxidation, but has low effect on antioxidant system.

	PC1 (n = 60)	CON1 (n = 60)
Age (years)	62.6 ± 9.5	60.2 ± 9.7
CA 19-9 (kU/l)	95.1 (25.5-1039.2)***	9.1 (5.5-15.7)
CEA (µg/l)	3.38 (1.7-7.5)***	0.69 (0.50-1.98)
CRP (mg/l)	11.0 (5.3-32.5)***	4.5 (2.0-5.7)
TC (mmol/l)	5.1 ± 1.7***	5.5 ± 0.9
HDL-C (mmol/l)	0.99 ± 0.39***	1.67 ± 0.35
GSH (µg/g Hb)	908.1 (91.9-3022.6)**	3247.4 (468.4-6610.3)



## Acknowledgment

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