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ANTI-INflAMMATORY MECHANISM OF MELANIN BY THE EXPRESSION OF TNF-A, NF-KB IN RAT LIVER WITH NAFLD/NASH

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In the previous study, we have showed the effects of exogenously administered melanin produced by yeast *Nadsoniella nigra strain X-1* on the obesity parameters of rats and the development of NAFLD/NASH. It was shown significant decrease of mass indexes and fat accumulation in visceral adipose tissue of treated rats that suggests preventive influence of melanin on obesity. The present study was performed to investigate the anti-inflammatory mechanism of melanin by the expression of TNF-α, NF-κB in rat liver with NAFLD/NASH.

There were 30 newborn Wistar male rats, divided into 3 groups: intact (n=10), monosodium glutamate (MSG) (n=10) and MSG + Melanin treated (n=10). Newborns rats of MSG-group and MSG + melanin group received a solution of MSG (4.0 mg/g of body weight) s.c. at 2^{nd}-10th days after birth. Within 4 months after birth, rats had a normal diet. MSG + melanin group received aqueous solution of melanin in dose 1 mg/kg at volume 2.5 ml/kg per os (p.o.). Melanin was obtained from *Pseudonadsoniella brunea (*before *Nadsoniella nigra X1 strain*) from Ukrainian Antarctic station. The impact of MSG on NAFLD development was assess by histological evaluation of the liver. As low-grade inflammation is one of the leading mechanisms of liver lesion in obesity, the proinflammatory activation of liver cells was analyzed by immunohistochemical assessment of CD68 cells, NF-kB and TNF-α expression.

Histological analysis of liver micropreparations confirmed the development of NAFLD in rats. We indicate the activation of NF-κB signaling pathway which cause NAFLD due to TNF-α overexpression in liver Kupffer cells of 4-month MSG-rats. The administration of melanin provided ameliorating effect on liver structure significantly decreasing the degree of steatosis and preventing injury of hepatocytes. The protective effect of polyphenol compounds melanin were confirmed histopathologically of TNF-α and NF-κB in the rat liver was analyzed using immunohistochemistry.