Effect of obestatin on contractility of excised frog heart preparations after treatment with desipramine

Bilyana Ilieva[1]*, Iliyana Sazdova[1], Hristo Gagov[1]

1 – Department of Human and Animal Physiology, Faculty of Biology, Sofia University "St. Kliment Ohridski", Sofia, Bulgaria

***Corresponding author:** b.ilieva@biofac.uni-sofia.bg*

ABSTRACT: The aim of this study is to investigate the inotropic effect of obestatin in the presence of desipramine in heart preparations of *Pelophylax ridibundus* frog. It is known that, the myocardial β-adrenoreceptors and cAMP-dependent protein kinase targets downstream are responsible for the observed positive inotropic effect of obestatin. The application of obestatin in concentrations of 1 nmol/l and 100 nmol/l significantly enhances the force of contraction of excised and cannulated frog hearts. This effect was completely blocked by in vitro application of 1 μmol/l desipramine.

Desipramine, a tricyclic secondary amine, inhibits the neuronal uptake of adrenaline and noradrenaline by binding to the noradrenaline transporter. In amphibians, adrenaline is the main sympathetic transmitter. In the frog heart, the endogenous adrenaline levels greatly exceed the noradrenaline levels and sympathetic stimulation results in the release of adrenaline but not noradrenaline.

It is concluded that, the treatment with desipramine inhibits adrenaline uptake by binds to the neuronal adrenaline transporter and abolishes adrenaline mediated positive inotropic effect of obestatin.

EXPERIMENTAL SETUP:

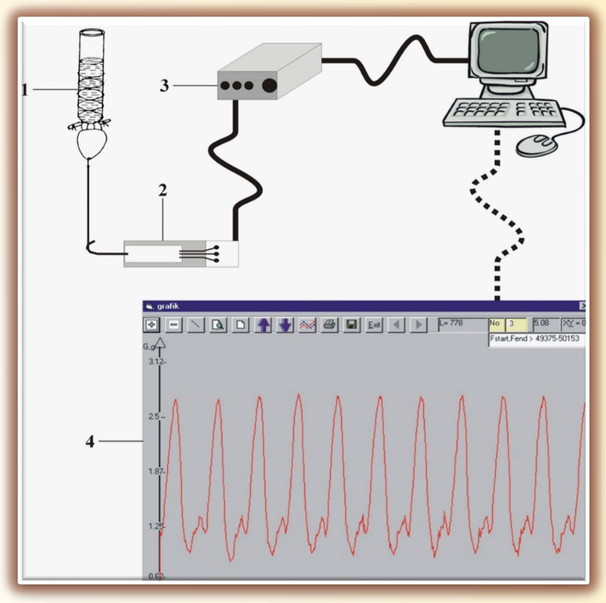

Fig.1 Experimental setup for recording of cardiac contractions TENZO-1 (Stocks, Sofia, Bulgaria). *1 - cannula with excised frog heart; 2 - force transducer; 3 – analog-digital converter; 4 – original record.*

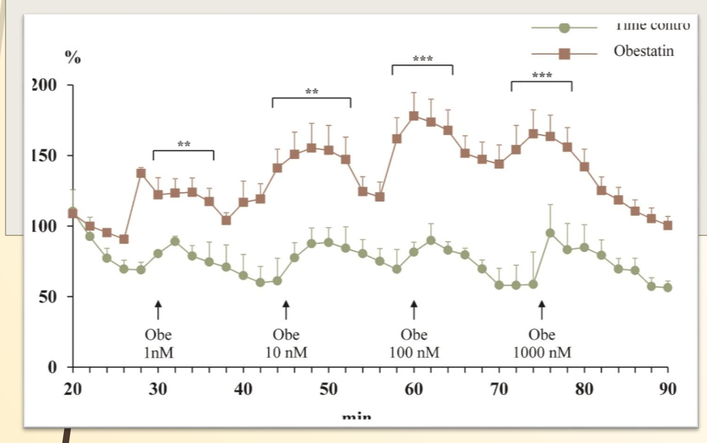

***Fig.2* Effect of obestatin on the maximal force of contractions of the frog heart preparations.** The effect of obestatin (■) is compared with control amplitude (●) of isolated frog heart. Data are presented as mean ± standard error (n = 6). *** P <0.001; ** P <0.01 (*Sazdova I.V, B.M Ilieva, I.B Minkov, R Schubert, H.S Gagov, 2009 Obestatin as contractile mediator of excised frog heart. Cent. Eur. J. Biol., 4 (3): 327-334.*)

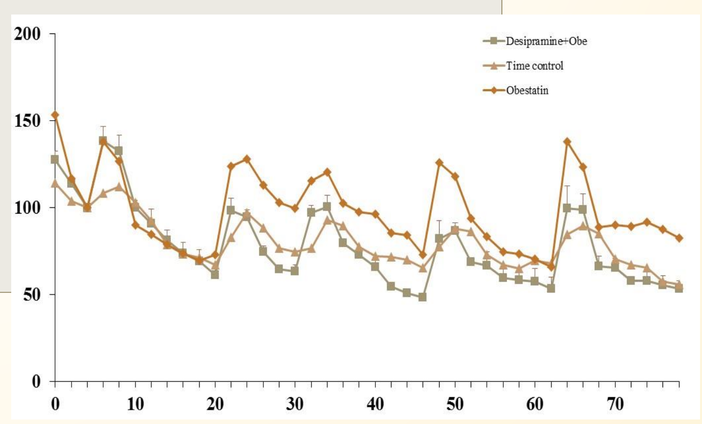

Fig.3 Effect of obestatin in presence of desipramine on the maximal force of contractions of the frog heart. *The effect of obestatin (▯) on the contractions of the frog heart is compared with those in presence of 1 μmol desipramine (■) and time control (▲). Data are presented as mean ± standard error (n = 6).*

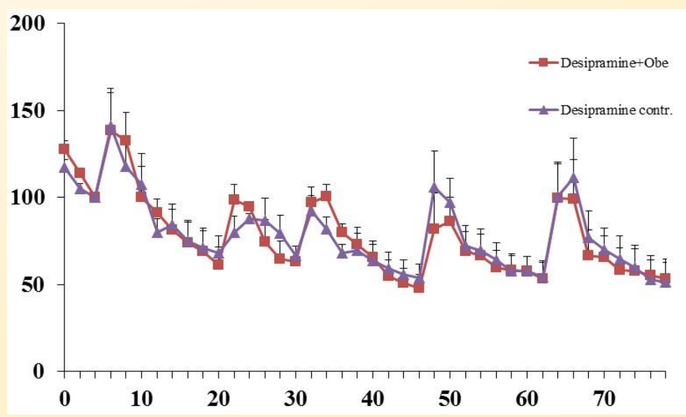

Fig.4 Effect of obestatin in presence of desipramine on the maximal force of contractions of the frog heart. *Desipramine was administered 15 minutes before obestatin The effect of obestatin at concentration of 1 μmol (■). Control data (▲) are given for comparison. Data are presented as mean ± standard error (n = 6).*

Acknowledgment:This work was supported by grant № 80-10-129/16.04.2020 from Sofia University "St. Kliment Ohridski".