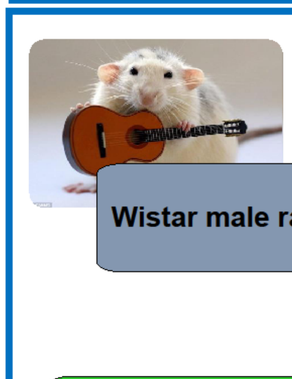
EP-709 TRIIODOTHYRONINE (T3) INHIBITS TSH SECRETION THROUGH A NON GENOMIC MECHANISM

Bargi-Souza P[1], Réndon L[2], Fiordelisio T[2], Nunes MT [1]. [1]Institute of Biomedical Sciences of University of São Paulo, SP, Brazil; [2]Facultad de Ciencias, Universidad Nacional Autónoma de México (UNAM)

CONTEXT AND OBJECTIVES

Thyrotropin (TSH) is the main regulator of the thyroid hormones (THs) synthesis/secretion, which in turn exert a negative feedback mechanism on the *Tshb* mRNA expression in the pituitary gland by reducing their transcription rate. Some of triiodothyronine (T3) effects are also shown in short period of time, characterizing a non genomic actions of THs. It has been shown previously that T3 acts on posttranscriptional steps of TSH synthesis and reduces its secretion when acutely administered to hypothyroid rats. The present study aimed to: 1) characterize the pathways involved in the rapid inhibition of the TSH secretion induced by T3 in primary cultures of anterior pituitary cells and; 2) evaluate the participation of T3 on calcium and magnesium intracellular mobilization in slices of pituitary of hypothyroid rats.

METHODS



RESULTS AND CONCLUSION

The results showed a rapid increase of TSHB content in intracellular extracts while the amount of TSH in extracellular media was reduced after T3 challenge. The treatment with RGD and wortmannin abolished T3 effects. No alteration on TSH secretion induced by T3 was observed in the presence of EGTA in the culture media neither in calcium intracellular mobilization, while intracellular concentration of magnesium was increased after T3 treatment.

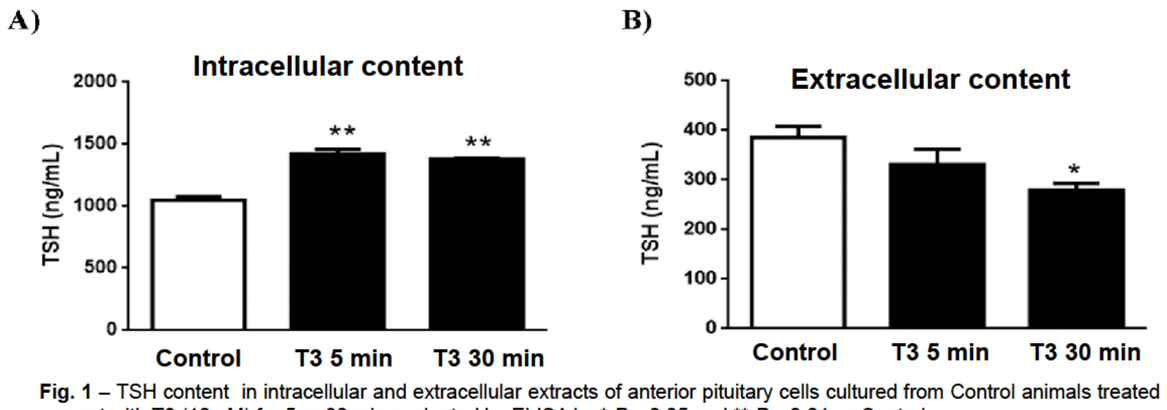


Fig. 1 – TSH content in intracellular and extracellular extracts of anterior pituitary cells cultured from Control animals treated or not with T3 (10 nM) for 5 or 30 min evaluated by ELISA in. * $P < 0.05$ and ** $P < 0.01$ *vs* Control.

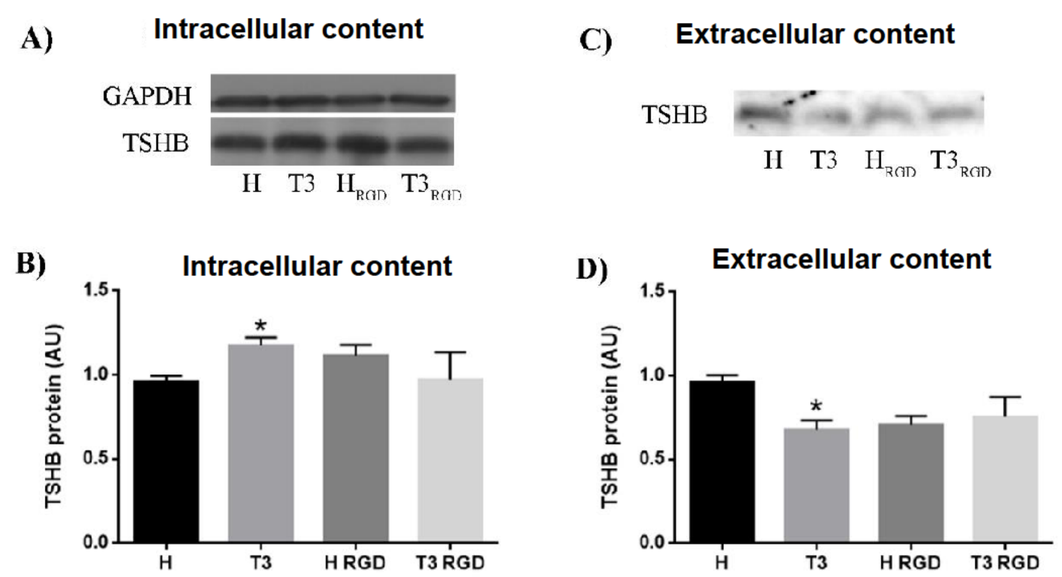


Fig. 2 – Intracellular (A and B) and extracellular (C and D) content of TSH in anterior pituitary cells from hypothyroid rats cultured in the presence or not of RGD and T3 (10 nM; 30 min) evaluated by western blotting. *P < 0.05 *vs* H (n = 4-14).

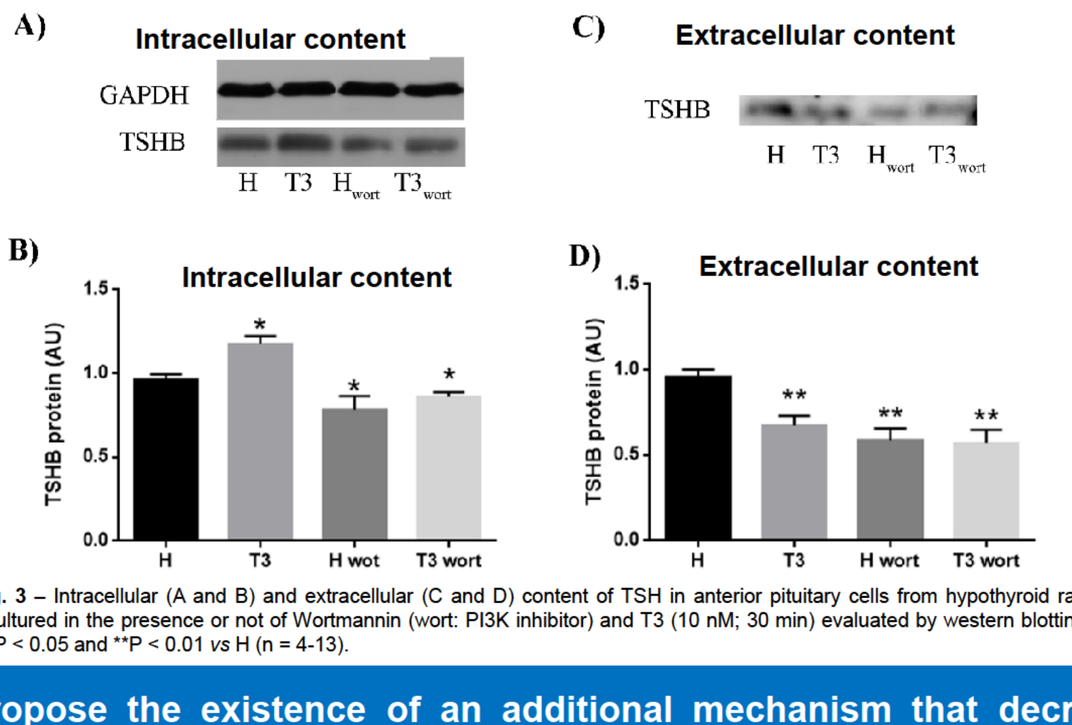


Fig. 3 – Intracellular (A and B) and extracellular (C and D) content of TSH in anterior pituitary cells from hypothyroid rats cultured in the presence or not of Wortmannin (wort: PI3K inhibitor) and T3 (10 nM; 30 min) evaluated by western blotting. *P < 0.05 and **P < 0.01 *vs* H (n = 4-13).

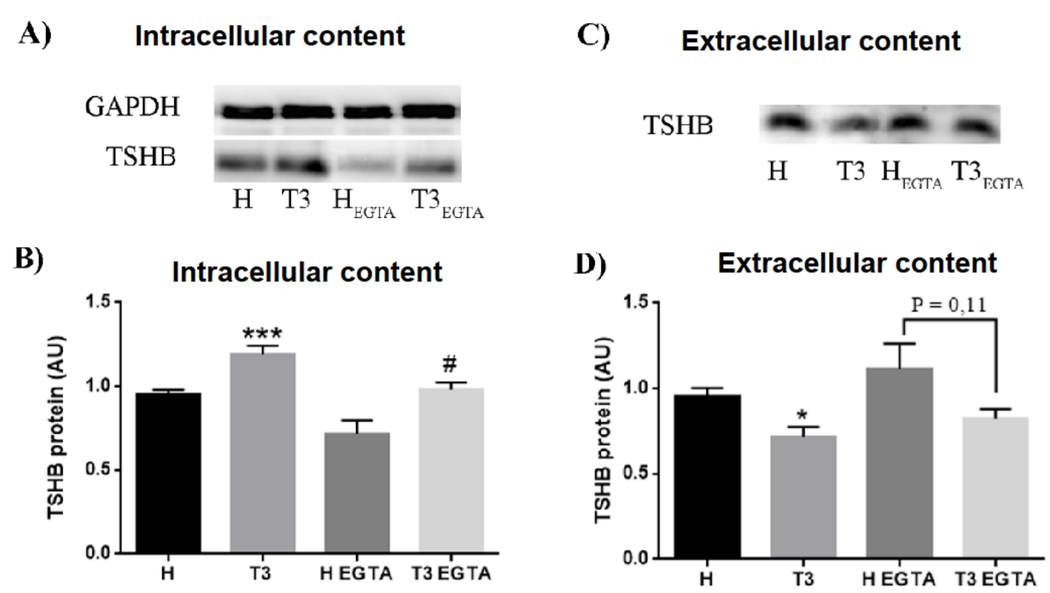


Fig. 4 – Intracellular (A and B) and extracellular (C and D) content of TSH in anterior pituitary cells from hypothyroid rats cultured in medium containing or not 1 mM of EGTA and T3 (10 nM; 30 min) evaluated by western blotting. *P < 0.05 and **P < 0.001 *vs* H; # P < 0.05 *vs* H_{EGTA} (n = 4-12).

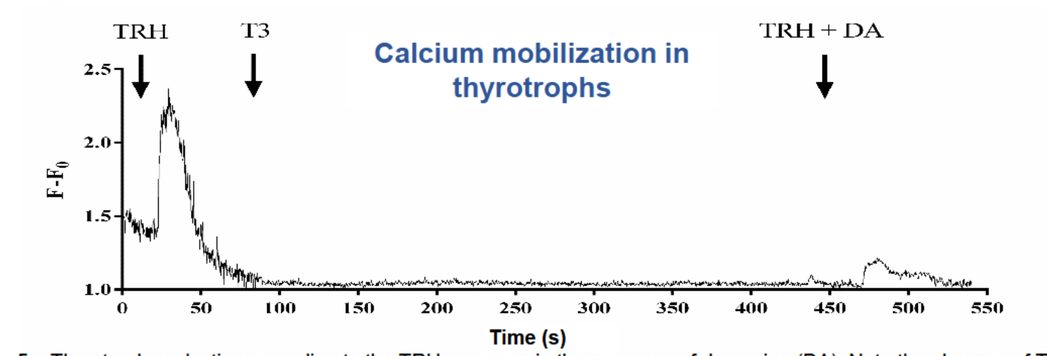


Fig. 5 – Thyrotrophs selection according to the TRH response in the presence of dopamine (DA). Note the absence of T3 effects on calcium mobilization. About 407 cells were evaluated in 7 different experiments, in which 90 were identified as thyrotrophs.

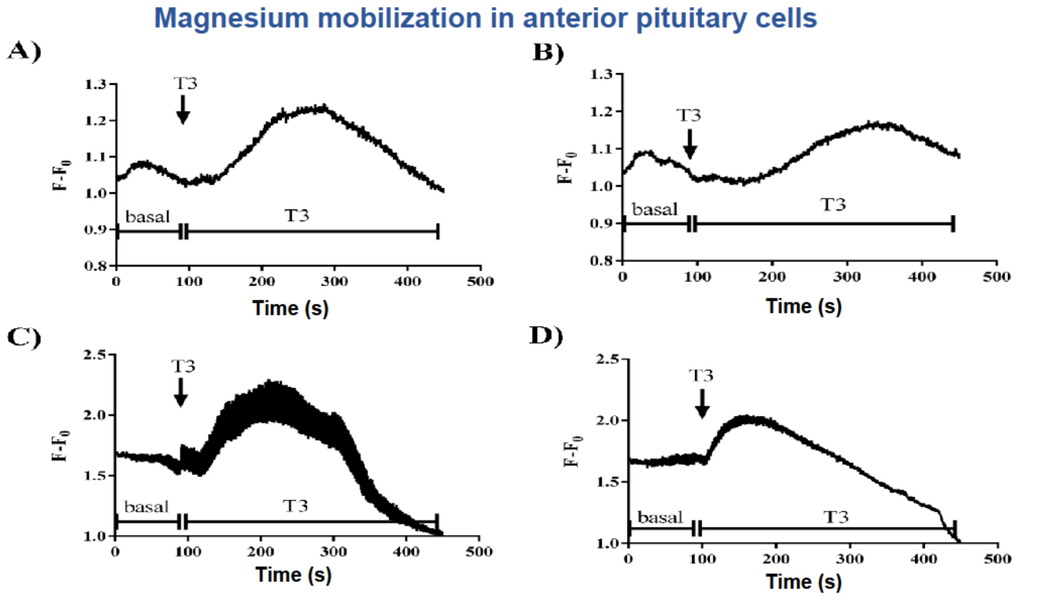


Fig. 6 – Increasing in intracellular concentration of magnesium after T3 treatment (15 min). The four pattern of magnesium response are shown in A-D figures and were observed in 16 % of anterior pituitary cells. About 407 cells were evaluated in 6 different experiments.

We propose the existence of an additional mechanism that decreases the TSH secretion, triggered in few minutes by T3, through its interaction with αVβ3 integrin at the plasma membrane, featuring a non genomic action of this thyroid hormone on its own synthesis and secretion.

Financial support: São Paulo Research Foundation - FAPESP 2009/17813-9.

17 ECE
709--EP
Pituitary basic and neuroendocrinology
Paula Bargi de Souza
DOI: 10.3252/pso.eu.17ece.2015
Poster presented at: ECE2015 16-20 May 2015 DUBLIN, IRELAND 17th EUROPEAN CONGRESS OF ENDOCRINOLOGY
PosterSessionOnline.com