

Influence of a tryptophan-rich diet on prostatic growth and androgen receptor expression

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BACKGROUND

- Benign Prostatic Hyperplasia (BPH) is a pathology with high prevalence whose etiology has not yet been clarified
- Recent studies revealed that serotonin (5-HT) inhibits benign prostate growth through modulation of the androgen receptor (AR).

OBJECTIVE

- To investigate the hypothesis that modulating the plasmatic levels of 5-HT through a tryptophan-rich diet (aminoacid precursor of 5-HT synthesis), could regulate prostatic growth.

METHODOLOGY

- 18 C57BL adult mice were divided in 2 groups according to diet (normal vs tryptophan-rich diet) for a 3-month period (Fig 1). After mice sacrifice, the prostates were dissected and weighted. Prostatic serotonin was quantified by ELISA and a Western Blot, to evaluate the androgen receptor expression. *IBM SPSS Software, v23.0* was used in all the statistical analysis and a p-value <0,05 was considered significant.

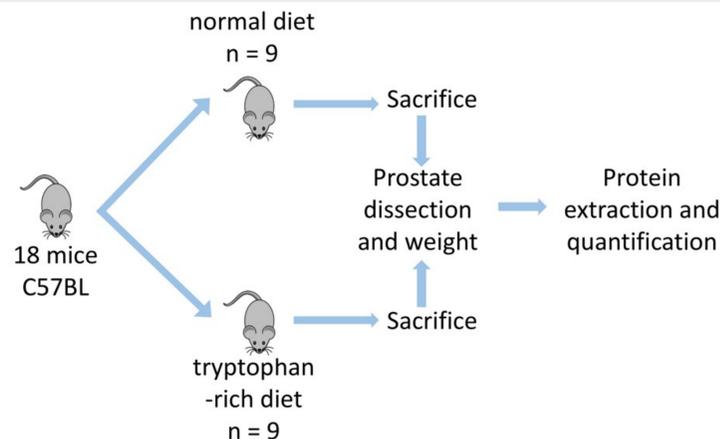


Fig. 1 - Experimental Design of the protocol adopted in this study.

RESULTS

Mice fed with the tryptophan-rich diet were associated with:

- inferior prostatic weight (p = 0.009) (Fig 2).
- superior intra-prostatic serotonin concentrations (p = 0.001) (Fig 3).
- inferior expression of androgen receptors in prostatic tissue (Fig 4).

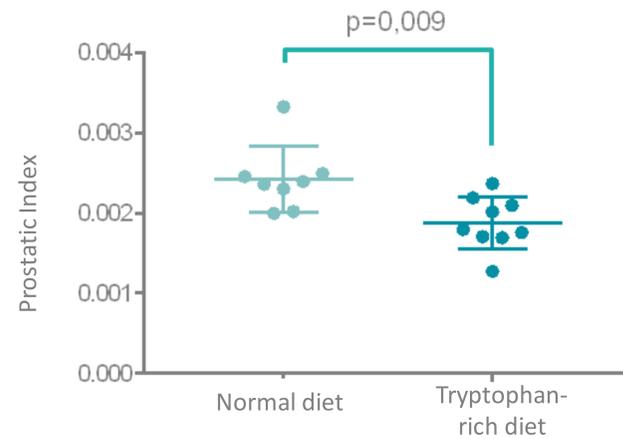


Fig.2 - The tryptophan-rich diet reduced the size of the mouse prostate. Comparison between prostatic index in mice fed for 3 months with normal diet (n = 9) vs. mice fed with a tryptophan-rich diet for 3 months (n = 9).

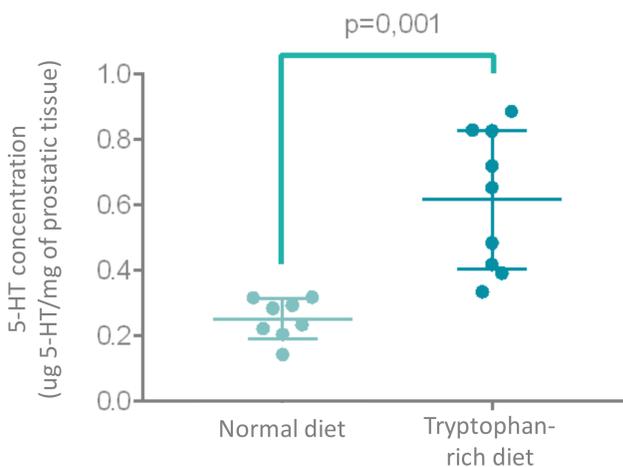
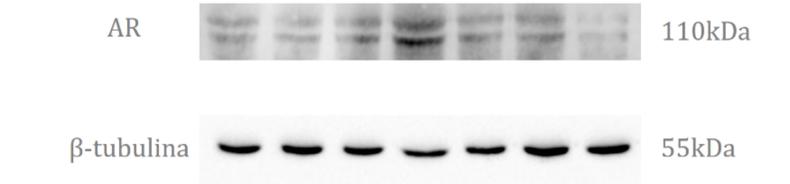


Fig. 3 - The diet rich in tryptophan significantly increases the intra-prostatic serotonin concentration. Comparison between the intra-prostatic concentration of Serotonin in mice fed with normal diet (n = 9) vs tryptophan-rich diet (n = 9) for 3 months.

4A: Normal diet



4B: Tryptophan rich-diet

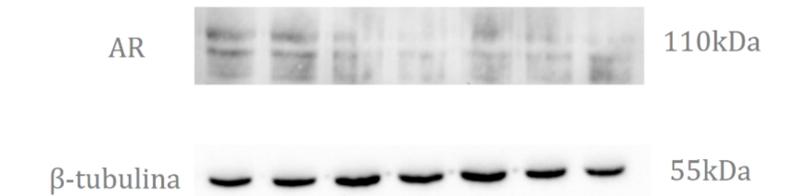


Fig. 4 – Tryptophan rich-diet decreased the expression of AR in the prostate
 4A: Expression of AR in mice fed normal diet for 3 months.
 4B: Expression of AR in mice fed tryptophan-rich diet for 3 months.

CONCLUSIONS

- ❖ Tryptophan-rich diet increases plasma serotonin and decreases prostate size by modulating the androgen receptor.
- ❖ These results suggest that dietary manipulation of tryptophan may be explored in the prevention and treatment of BPH.