

Steroid hormones in murine schistosomiasis mansoni

Oliveira K.C.¹, Cardoso R.², Dos Santos A.C.¹, Alves H.^{2,3}, Richter J.⁴, Botelho M.C.^{2,5}

¹ Núcleo de Enteroparasitas, Centro de Parasitologia e Micologia, Instituto Adolfo Lutz, São Paulo, Brazil ² INSA, National Institute of Health Dr. Ricardo Jorge, Department of Health Promotion and Chronic Diseases, Porto, Portugal, ³ Fundação Professor Ernesto Morais, Porto, Portugal, ⁴ Institute of Tropical Medicine and International Health, Charité – Universitätsmedizin Berlin, Germany, ⁵ I3S, Instituto de Investigação e Inovação da Universidade do Porto, Portugal

AIM

The aim of this study was to study a panel of steroid hormones in hamsters infected with *S. mansoni*.

BACKGROUND

- Schistosomiasis is a neglected tropical disease, endemic in 76 countries, that afflicts more than 240 million people.
- The impact of schistosomiasis on infertility may be underestimated according to recent literature.
- Extracts of *Schistosoma* (*S.*) *haematobium* include estrogen-like metabolites termed catechol-estrogens that down regulate estrogen receptors alpha and beta in estrogen responsive cells. In addition, schistosome derived catechol-estrogens induce genotoxicity that result in estrogen-DNA adducts and cause hormonal imbalance. (Fig.1)
- We now hypothesize the induction of infertility in individuals infected with *S. mansoni* also through an hormonal imbalance.

METHODOLOGICAL STRATEGY

By electrochemoluminescence (ECLIA) we tested Estradiol (E2), Testosterone, Progesterone, Prolactin, Luteinizing Hormone (LH) and Follicle Stimulating Hormone (FSH) in the sera of animals infected with *S. mansoni* in comparison with controls.

RESULTS

We found a decrease in the serum levels of E2, Testosterone and Progesterone in infected females and an increase of Testosterone and a decrease in Progesterone in infected males in comparison with controls.

Hormone serum levels among males and females negative (Sm -ve) and positive (Sm +ve) for *S. mansoni*.

Hormones	Female Sh -ve	Female Sh +ve	p
Estradiol	3385±1238,851	499,07±489,93	0.03
Testosterone	0,974±0,52	0,087±0.01	0.04
Progesterone	96,67±48,84	11,015±2.61	0.04

Hormones	Male Sh -ve	Male Sh +ve	p
Estradiol	N.D.	N.D.	N.D.
Testosterone	3,14±0,52	8,57±5,16	0.04
Progesterone	101,2±55,08	61,66±37,03	0.01

CONCLUSIONS

- To our knowledge this is the first study addressing the role of steroid hormones in *S. mansoni* infection.
- These results emphasize the possible role of hormonal imbalance in the pathogenesis of this infection and that schistosomiasis has an important metabolic effect that may affect the fertility of the infected host (Fig. 2).

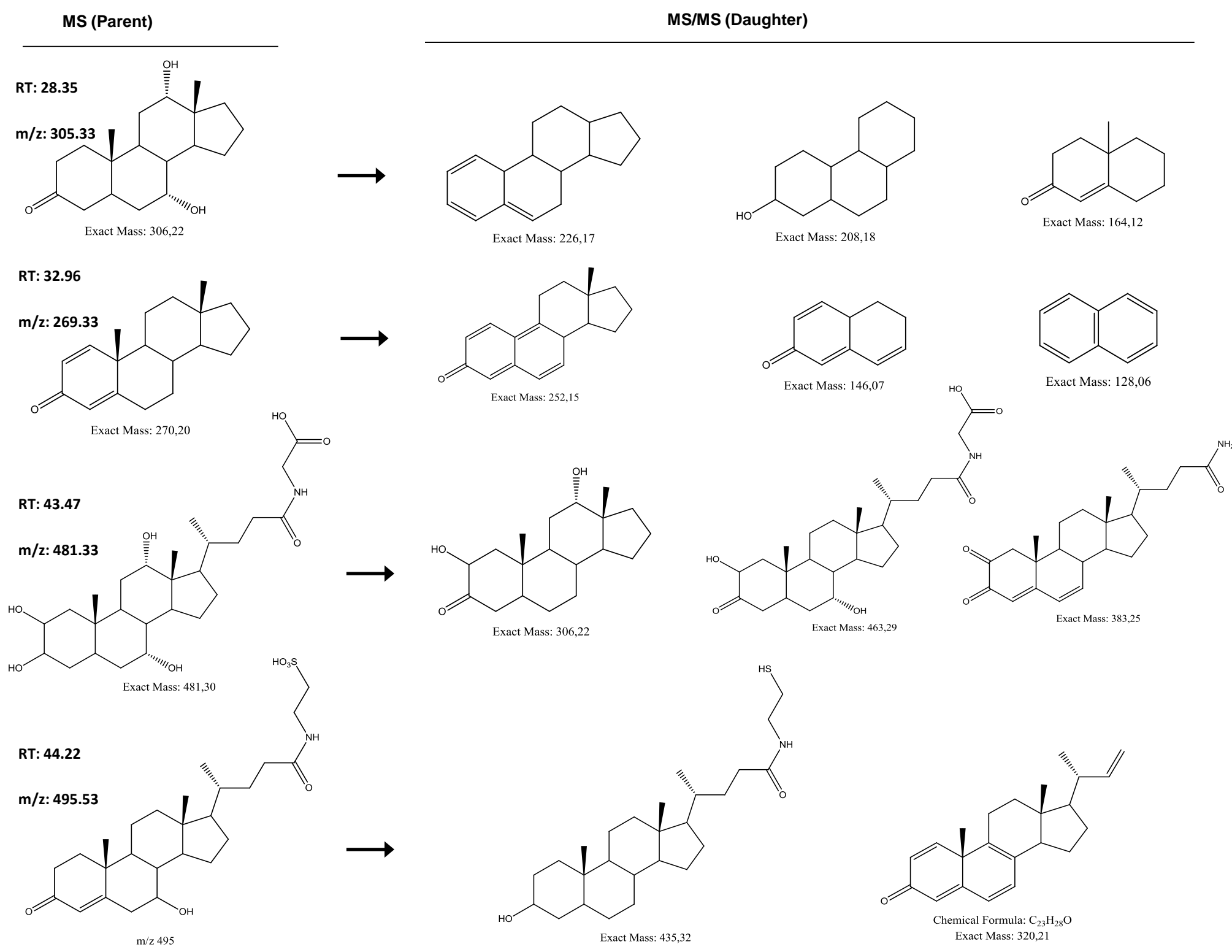


Fig. 1: *Schistosoma* catechol-estrogens

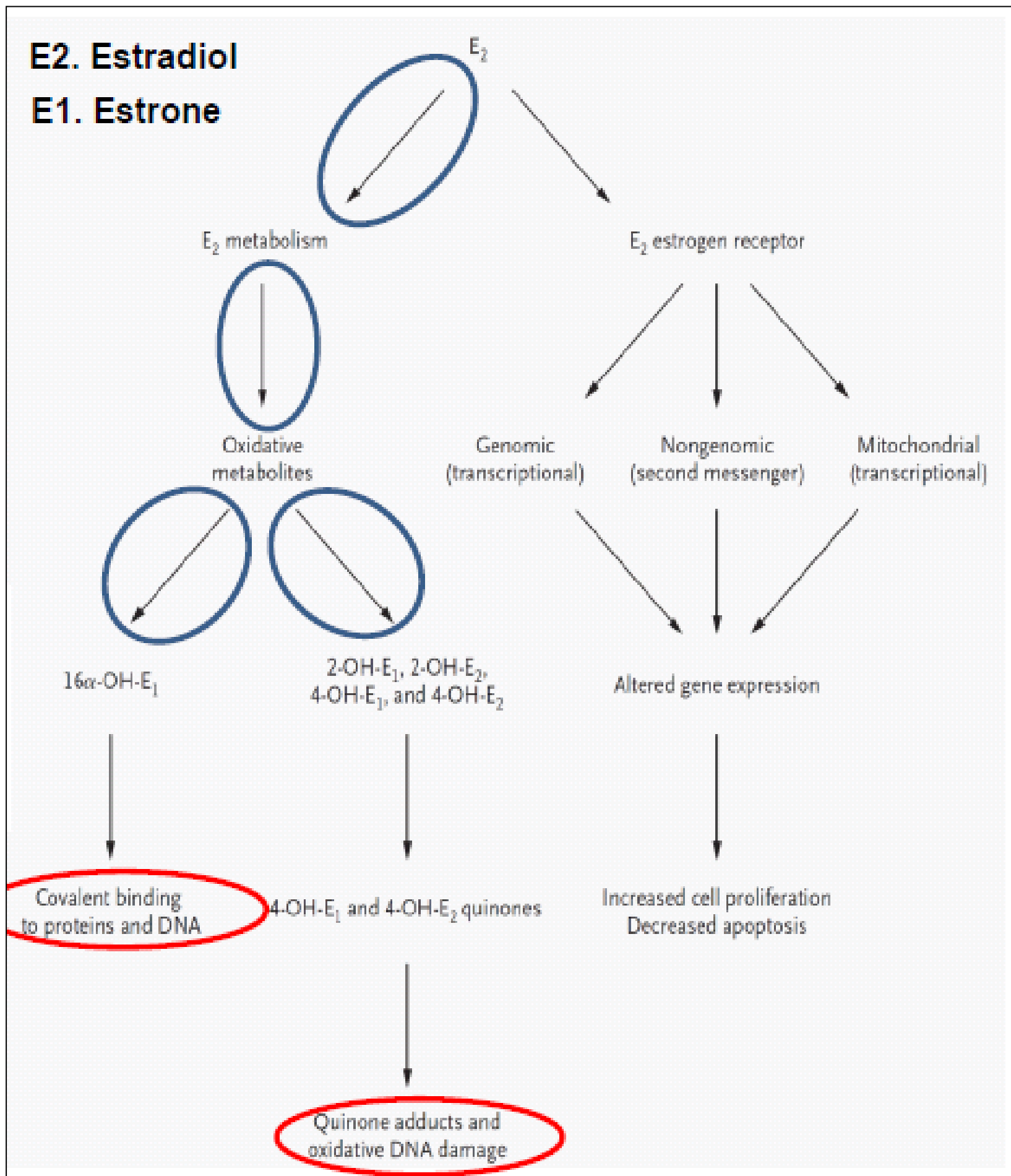


Fig. 2: Proposed pathway for hormonal imbalance and infertility.