



# 56<sup>th</sup>

## NATIONAL MEETING OF THE ITALIAN SOCIETY OF BIOCHEMISTRY AND MOLECULAR BIOLOGY

**CHIETI**  
**26<sup>th</sup>-29<sup>th</sup> SEPTEMBER 2012**

Venue: New Rectorate Auditorium



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## Xanthine dehydrogenase processes retinol to retinoic acid in human thyroid epithelial cells

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Retinoic acid is considered to be the active metabolite of retinol, able to control proliferation and differentiation of epithelia. Retinoic acid biosynthesis has been widely described with the implication of multiple enzymatic activities but our understanding of their biological function or regulation in the cell is limited. In our previous study (1) we have evidenced that milk xanthine oxidase (XO) is capable to oxidize all-trans-retinol bound to CRBP to all-trans-retinaldehyde and then to all-trans-retinoic acid. Afterwards, we have evaluated the biosynthetic pathway of retinoic acid in a human mammary epithelial cell line (HMEC) (2) in which xanthine dehydrogenase (XDH) is expressed, and we have reported the demonstration of a novel retinol oxidation pathway that in the HMEC cytoplasm directly leads to retinoic acid. In this work, new data from human thyroid epithelial cells (HTEC) supporting the biological role of XDH in retinoic acid biosynthesis are given. Particularly, we report that the same biosynthetic retinoic acid pathway is also expressed in the HTEC primary cultures. After partial protein purification, the enzyme was identified as XDH by immunoassay, by its ability to oxidize xanthine to uric acid and its sensitivity to the oxypurinol inhibitory effect. We have observed that in this thyroid epithelial cell line, CRBP(s) support the catalytic system that, as well as in human mammary epithelial cells, directly oxidizes t-ROL to t-RA. Furthermore, it was also observed that XDH activity was undetectable on both retinol and purines after polyclonal XO/AO antibody treatment.

1. Taibi G. and Nicotra CMA. Xanthine oxidase catalyzes the oxidation of retinol. *J Enz Inhib Med Chem* 2007; 22(4): 471-476.
2. Taibi G., Di Gaudio F., Nicotra CMA. Xanthine dehydrogenase processes retinol to retinoic acid in human mammary epithelial cells. *J Enz Inhib Med Chem* 2008; 23(3): 317-327.