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## Hydroquinone and its derivatives in treatment of hyperpigmentation

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Hydroquinone is well known as a product for treatment of hyperpigmentation. But in the Middle Eastern countries bleaching became the major interest for Eastern/Arabic woman even for males also. This feeling to have lighter skin is increased at the recent era due to multimedia connection between countries Eastern & Western which motivate Eastern people to be lighter. Since around 10 years hydroquinone was dispensed plain in form of cream, then a pharmaceutical company in Egypt started to produce it in combined form with Tretinoin. Hydroquinone (HQ) is one of the most effective inhibitors of melanogenesis *in vitro* and *in vivo* and is widely used for the treatment of melanosis and other hyperpigmentary disorders. In an attempt to get some insight into the molecular mechanism of the depigmenting action, which is still very poorly understood, we have investigated the effect of HQ on the tyrosinase catalyzed conversion of tyrosine to melanin. Incubation of 0.5 mM tyrosine with 0.07 U per ml tyrosinase in phosphate buffer at pH 6.8 in the presence of 0.5 mM HQ led to no detectable melanin formation, due to the preferential oxidation of HQ with respect to tyrosine (HPLC evidence). Kinetic investigations showed that HQ is a poorer substrate of tyrosinase than tyrosine; yet, it may be effectively oxidized in the presence of tyrosine owing to the generation of catalytic amounts of dopa acting as co-factor of tyrosinase. Product analysis of HQ oxidation with tyrosinase in the presence of dopa showed the predominant formation in the early stages of hydroxybenzoquinone (HBQ), arising from enzymatic hydroxylation and subsequent oxidation of HQ, along with lower amounts of benzoquinone (BQ). These results suggest that the depigmenting activity of HQ may partly be related to the ability of the compound to act as an alternate substrate of tyrosinase, thereby competing for tyrosine oxidation in active melanocytes. Also monobenzyl ether of hydroquinone is misused by some patient and even it is considered as treatment of vitiligo but also started to be used as a cream for treatment of hyperpigmentation.

### Biography

Antonios Ramsis Gaber Mikhaeel has completed his Bachelor of Pharmacy degree from Misr University for Science and Technology, Cairo, Egypt. He is the Owner and Manager of Ramsis Pharmacy in Cairo, Egypt and also a Senior Pharmacist of Muscat Dermatology & Laser Center, Muscat, Oman.

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