

# **Photodynamic anticancer agent merocyanine540**

## **inhibits cell growth by apoptosis.**

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### **Abstract**

Several merocyanine compounds have been described as inducing photosensitization of tumor cells resulting in cell death. We studied the merocyanine540 (MC540) which induced apoptosis in well/moderately differentiated (HT29, Skco-1) and poorly differentiated (COLO205, SW480, COLO320HSR) colorectal carcinoma cell lines. These cells were incubated with MC540 in the presence or absence of white light. Light activated MC540 can induce death in these cells and poorly differentiated cells being the most sensitive. In the absence of light, MC540 only induced apoptosis in COLO205 cells. MC540 also arrested HT29 cells at the G1 phase during cell cycle progression. In order to understand which genes regulated apoptosis and which genes regulated G1 arrest, the expression of p53 and Rb genes in MC540 treated cells was analyzed. The results indicated that the mechanism of MC540 induction is associated with two distinctive genetic responses namely inducing nuclear p53 proteins accumulation (COLO205), though this may be not essential for MC540 induced apoptosis, and overexpressing the unphosphorylated Rb proteins which may cause G1 arrest (HT29). Based on these findings, we proposed that one mechanism of MC540 induced cell apoptosis might relate to the expression of p53 and Rb genes in the target cells.