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**PHOTOCARCINOGENICITY AND BLACK TATTOOS, SCREEN EFFECT OF BLACK PIGMENT AND DELAY OF SKIN CANCER DEVELOPMENT**

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**Aim:** The purpose of this study is to investigate synergistic tumour induction effect of the combination of ultraviolet radiation (UVR) and a chemical carcinogen. Photocarcinogenesis involves substances that are carcinogenic in combination with UVR. The black tattoo used contains high amounts of the known carcinogen, benzo(a)pyren (BaP).

**Methods:** Immunocompetent mice were tattooed on their back with a black ink\* which has a high content of BaP. Half of the mice were irradiated with three standard erythema doses UVR three times weekly. Time to induction of first, second and third squamous cell carcinoma (SCC) was measured. Controls were tattooed without ink. The colour of the tattooed skin was measured by CIELAB L.

**Results:** All irradiated mice developed SCCs while no malignant tumours were seen in the non-irradiated group. In the tattooed and irradiated group the development of SCCs was significantly *delayed* compared with the controls not tattoo and irradiated. The median delay until onset of first, second and third SCC was 49 days, 49 days, 56 days respectively in the two groups ( $p < 0.001$ ), see table.

	Group no.	Number of mice (n)	Treatment	Development of tumours
Chemical carcinogenesis	1	25	+ tattoo + UVR	NO
	2	25	+ tattoo + UVR	NO
Photo-carcinogenesis	3	25	+ tattoo + UVR	YES
	4	24	+ tattoo + UVR	YES *

\*Significantly delayed compared with group 3.

**Conclusions:** Non-irradiated mice with black tattoos manifested *no* observed skin cancer despite the fact that the ink was rich in BaP. Surprisingly we found UVR cancer induction to be significantly *delayed* in black tattooed mice versus mice surrogate "tattooed" without ink. Black tattoos were clearly protective against the development of UVR-induced skin cancer in mice. Black tattoo pigment in the dermis reduces backscatter of UVR which may explain the study outcome, supported by colorimetric measurement.

\*black ink used: "Tribal Black"