EFFECT OF DEXAMETHASONE ON ANTLER CELLS IN VITRO

M. Sadighi, R.P. Littlejohn, A.J. Harris and J.M. Suttie

AgResearch, Invermay Agricultural Centre, Private Bag 50034, Mosgiel, New Zealand

The aims of this study were to investigate the distribution of alkaline phosphatase (ALP) in antler tip cells and its induction in the presence of dexamethsone because it has been shown that dexamethasone stimulates in differentiation of bone. The antlers of red deer stags were harvested after 60 days of growth and primary cultures of mesenchymal, precartilagenous, and cartilagenous cells were prepared. $2x10^4$ cells/cm^2 were seeded in 24 well plates and incubated in media as follows in 45% BGJ_b, 45% F_{12} nutrient. Media was supplemented with 10% fetal bovine serum, penicillin (100U/ml) and streptomycin (100µg/ml). Cells were incubated in humidified 5% CO_2 at 37° for 72 hr. After this the media was replaced for the control cells or 5nM dexamethasone was added to the media for the treated cells and they were incubated for a further 92 hr. At the termination of the experiment the media was removed and cells were washed with PBS and dissolved in PBS containing 0.1% Triton X100. ALP was measured using ρ-nitrophenyl phosphate as a substrate. Results are geometric means of triplicate experiment analysed by ANOVA after logarithmic transformation and are expressed as nmole phosphate hydrolysed/µg protein.

	Mesenchymal	Precartilagenous	Cartilagenous
Control	12.1	20.8	38.7
Dexamethasone	27.3	25.3	120.3

SER (the standard error of ratio) = 1.067.

Alkaline phosphatase was present in all control cell lines but the highest specific activity was found in cartilagenous cells. Dexamethasone induced alkaline phosphatase in all cell types but the greatest response was present in the cartilagenous cells. Although it is possible that the required incubation conditions differed for the cell types, a plausible conclusion for the ALP results is that the cartilagenous cells differ in their response to dexamethasone. This may be because they have an altered phenotype which can undergo mineralisation.