

Autoradiographic localization of androgen binding sites in the antlerogenic periosteum in red deer (*Cervus elaphus*)

325

C. Li, A.J. Harris¹ and J.M. Suttie

AgResearch, Invermay Agricultural Centre, Private Bag 50034, Mosgiel, New Zealand and ¹University of Otago, PO Box 56, Dunedin, New Zealand

The potential to develop pedicles grown by male deer at puberty resides in the antlerogenic periosteum on the frontal lateral crest. Deer cannot grow pedicles without androgen hormone stimulation. The aim was to determine whether antlerogenic periosteum contained androgen specific-binding sites. Periosteum were taken from male and female red deer (*Cervus elaphus*) calves and prostate gland from a mouse (positive control). For autoradiography, the tissue explants were dispersed to dishes with different media, BGJb in dish one; BGJb and 10nM ³H-testosterone (T) in dish two; BGJb, 10nM ³H-T and dihydrotestosterone (DHT) at 200-fold excess and cultured for 3, 4.5 and 6 hr. Autoradiograms were quantified by grain counting under oil immersion at a magnification of 1000X.

There was specific ³H-T binding in prostate tissue. Specific labelled cells were found in

autoradiograms of the both cellular and fibrous layers of the antlerogenic periosteum of both sexes following *in vitro* incubation with ³H-T or ³H-T with excess DHT, but not in autoradiograms of the facial periosteum of both sexes (Table 1). A major difference was found between antlerogenic and facial periosteum ($p < 0.001$), and also differences with sex ($p < 0.01$) and treatment (T or T + DHT) ($p < 0.01$), but not with layer ($p = 0.051$). Deer pedicle initiation results from direct stimulation by androgen hormone. Testosterone might exert its effects on antlerogenic tissue directly rather than through the DHT pathway. Female deer antlerogenic periosteum has a similar capacity for uptake and retention of T compared with male. Both cellular and fibrous layers of antlerogenic periosteum may be actively involved in pedicle and antler formation.

Table 1: Silver grains per nucleus (s.e.) from red deer periosteum

Sex	Periosteum	Treatment	No of Counted Grids	No of Counted Nuclei	Grains per Nucleus
Male	Antlerogenic	T	36	335	6.8 (0.75)
		T + DHT	24	261	5.5 (0.83)
	Facial	T	12	98	1.9 (0.68)
		T + DHT	12	88	1.1 (0.53)
Female	Antlerogenic	T	24	230	5.4 (0.82)
		T + DHT	18	172	3.8 (0.78)
	Facial	T	12	60	0.8 (0.44)
		T + DHT	12	53	1.3 (0.56)