between adenocarcinoma and squamous carcinoma of the cervix,¹ more recent work has suggested a rise in incidence of mixed invasive adenosquamous carcinoma in young women which may be associated with a higher incidence of nodal metastases compared with other histological types of cervical carcinoma.^{2,3}

Nucleolar organiser regions (NOR's) are chromosomal segments containing encoded ribosomal RNA which can be visualised in histological sections using a silver colloid technique when they are termed AgNOR's. We looked at AgNOR's in the different histological types of cervical carcinoma and compared them with the proliferative index as determined by flow cytometry, with the aim of determining whether the adenosquamous tumours represent a separate and more aggressive subtype.

We applied the silver colloid method⁴ to 46 carcinomas comprising 19 squamous, seven squamous with occasional intracellular mucin globules, 15 adenosquamous and four adenocarcinomas, and counted 200 randomly selected cells in each case. Each tumour was graded as I, II, or III by a separate observer, corresponding to well, moderately, or poorly differentiated, respec-

tively. Flow cytometry was performed on 24 cases, using tissue retrieved from stored paraffin wax blocks, and stained with propidium iodide. The proliferative index (PI) was calculated as the proportion of cells in the DNA synthetic phase. Only three cases were aneuploid, all were adenosquamous in type and of grade II (n=1) or III (n=2) (table).

The large standard deviation within some groups highlights the wide spread of results between cases. Differences between the groups were analysed using Student's *t* test. There was no significant difference in the proliferative index among any of the tumour types. There was no difference in the AgNOR count between the squamous, squamous with mucin, and adenosquamous tumours. The difference in AgNOR count between adenocarcinomas and both squamous and adenosquamous carcinomas just reached statistical significance (*t* = 0.011 and 0.042, respectively, *p* < 0.05). Overall, there was no association between tumour grade and either AgNOR count or proliferative index, and, interestingly, no correlation between proliferative index and mean number of AgNOR's per cell.

We conclude that enumeration of

AgNOR's is of no practical use in distinguishing between the histological type or grade of cervical carcinoma, and that the AgNOR count does not seem to be a direct marker of proliferative activity in these tumours taking flow cytometric determination of proliferative index as the baseline. The AgNOR technique did not show any difference between adenosquamous tumours and the other types to suggest that adenosquamous tumours are a more rapidly progressing type. Similarly, the proliferative index does not suggest this, but the fact that all aneuploid tumours seen were in the adenosquamous group merits further study. The most important use of these methods would clearly be in predicting survival in an individual case, and further work to evaluate their possible use for this is in progress.

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Table AgNOR count and proliferative index in different histological types and grades of cervical carcinoma

Tumour type/grade	AgNOR's			Proliferative index		
	No tested	Mean AgNORs	SD	No tested	Mean PI (%)	SD
Squamous	19	5.99	1.89	6	16.27	6.85
Squamous with mucin	7	5.84	2.21	3	23.17	8.98
Adenosquamous	15	6.04	2.43	10	28.21	13.78
Adenocarcinoma	5	3.58	0.77	5	31.81	26.45
Grade I	4	4.16	1.03	4	29.87	23.30
Grade II	25	6.04	2.03	11	25.63	16.41
Grade III	17	5.64	2.38	9	22.98	12.50

Matters arising

Granulomas of the kidney induced by Bacillus Calmette Guérin (BCG)

We read with interest the recent letter describing granulomata of the prostate induced by Bacillus Calmette Guérin (BCG).¹ We saw similar granulomas in a nephrectomy specimen from a 73 year old man who had received intravesical BCG for bladder cancer. An incidental finding was a wedge-shaped lesion related to a dilated calyx and containing both caseating and non-caseating granulomas. The patient had no evidence of tuberculosis clinically or on subsequent

investigation. He almost certainly had vesicorenal reflux, and this probably gave rise to the granulomas. Full details of this case have been submitted to the *British Journal of Urology*.

Two other cases of renal granulomas following intravesicular BCG have been described.^{2,3} These cases, together with the prostatic examples reported by Ramani and Griffin, illustrate that we can expect to find such granulomas anywhere within the urinary tract. These are likely to become more common as the use of BCG in treating bladder cancer becomes more widespread.

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