

other acidophilic. To know whether this difference reflects any true chemical characterization, it seems desirable to study these nucleoli from a cytochemical standpoint. As a preliminary approach, we have followed the cytochemical tests for nucleic acids on the adrenocortical nucleolar components of the common Indian domestic pigeon (*Columba livia*, Gmelin). The histological and cytochemical techniques followed, have been incorporated in the table.

Table showing the Cytochemical Dimorphism of Adrenocortical Nucleoli (*Columba livia*)

	Nucleolus ¹⁾	Nucleolus ²⁾
A. Affinity for Histological Dyes:		
1. Heidenhain's azan	Azo carmine	Aniline Blue
2. Mallory's Triple	Acid Fuchsin	Aniline Blue
3. Masson's Trichrome	Hematoxylin	Light Green
B. Tests for Nucleic Acids:		
1. Feulgen technique	Feulgen	negative
2. Feulgen-Light Green Method [SEMMENS and BHADURI, 1941 ⁸⁾]	Feulgen	Light Green
3. Pyronin-Methyl Green		
a) Control	Methyl Green	Pyronin
b) RNase digestion (2-hrs. at 37° C)	Methyl Green	negative

A perusal of the accompanying table reveals that the acidophil and basiphil properties of the two nucleoli are entirely misleading (Fig. 1). While studying these properties in molluscan oocyte nucleoli, SERRA and LOPEZ²⁾ also arrived at the same conclusion. Looking at the same table, one may find that one of the nucleoli is Feulgen-positive (Fig. 2), while the other stains with Pyronin. In the former, Schiff reaction

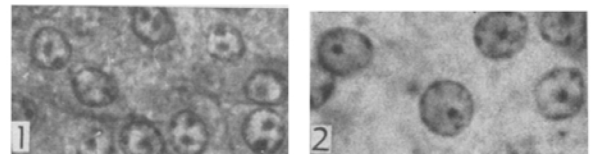


Fig. 1. Adrenocortical cells of the pigeon showing two distinct nucleoli in an individual nucleus. Heidenhain's azan Stain. × 2300

Fig. 2. Same cells presenting clearly DNA-positive nucleolus. Feulgen technique. × 2700

is intense and almost uniform barring the central region of some nucleoli, where the stainable material is less dense. This observation confirms to an extent that the nucleolus concerned is not associated with the heterochromatin [DAVIES³⁾].

The presence of nucleolar DNA material in granular and vesicular form is not very uncommon [see BRACHET⁴⁾]. In deviation from other cytological findings, we have noted that in our preparations Feulgen-positive substance fills up the entire area of nucleolar pars amorpha. To our knowledge the only other report which simulates closely with our findings is that by MULNARD⁵⁾. Now a question may be raised as to the origin of this DNA-rich nucleolus. It may be suggested that this structure has been originated by a transformation of the 'Feulgen-positive nucleolar filaments' [LETTRE⁶⁾] into a homogenous mass. This possibility may very well exist in view of BORYSKO and BANG'S⁷⁾ electron microscopic findings on the nucleolus. Leaving aside the problem of genesis of this chemically different nucleolus, it will also be worthwhile to investigate in future the functional significance of this unique cellular component.

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On the Occurrence of Feulgen Positive Nucleoli in Adrenocortical Cells of the Pigeon

MILLER and RIDDLE¹⁾ have casually referred to a differential dye-binding behaviour of nucleoli present in the adrenocortical cells of the White Carneau pigeons. Accordingly, these authors claim one type of nucleolus to be basiphil, and the

¹⁾ MILLER, R. A., and O. RIDDLE: Amer. J. Anat. 71, 311 (1942). — ²⁾ SERRA, J. A., and A. QUEIROZ LOPEZ: Portug. Acta Biol., Sér. A 1, 2, 51 (1945). — ³⁾ DAVIES, J.M.G.: The Ultrastructure of the

Mammalian Nucleolus. The Cell Nucleus, ed. J.S. MITCHELL. London: Butterworths 1960. — ⁴⁾ BRACHET, J.: Biochemical Cytology. New York: Academic Press, Inc. 1957. — ⁵⁾ MULNARD, J.: Arch. Biol. [Liege] 67, 485 (1956). — ⁶⁾ LETTRÉ, R.: Observations on the Behavior of the Nucleolus of Cells in vitro. Fine Structure of Cells. Groningen: P. Noordhoff Ltd. 1955. — ⁷⁾ BORYSCO, E., and F.B. BANG: Bull. Johns Hopkins Hosp. 89, 468 (1951). — ⁸⁾ SEMMENS, C. S., and P. N. BHADURI: Stain Technol. 16, 119 (1941).