

INTRACYTOPLASMIC GRANULES IN BLOOD NEUTROPHILS OF FRENCH BULLDOG: FRIENDS OR FOES?

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BACKGROUND: Intracytoplasmic granules (IG) are described in blood neutrophils (PMNs) in various diseases or as inheritance in few canine or feline breeds,^{1,2} but not in French Bulldogs (FB). During the routine activity of MyLav diagnostic laboratory, we anecdotally noted IG in PMNs in FB.

OBJECTIVE: 1) to describe IG in PMNs of FB blood smears; 2) to preliminary investigate their possible nature or significance.

METHODS: May-Grunwald Giemsa-stained (MGG) blood smears from 23 FB (one of which, sampled twice over a three-month period) were examined microscopically. One sample was also stained with toluidine blue (TB) and periodic acid-Schiff (PAS) and subjected to transmission electron microscopy (TEM). Clinical and hematological results, and geographical origin were also collected.

RESULTS: Small intracytoplasmic purple/reddish granules in circulating PMNs (1-2 µm in size, 2-10 per cell) were observed in all 23 FB (Figure 1). The granules were present in smears of the dog sampled twice. The granules did not stain with TB (Figure 2). The PMNs stained diffusely positive for PAS, similar to normal PMNs of other breeds (Figure 3). TEM did not reveal any abnormality (Figure 4). Signalment and clinical or laboratory data of the 23 FB included in this study, when available, are reported in table 1.

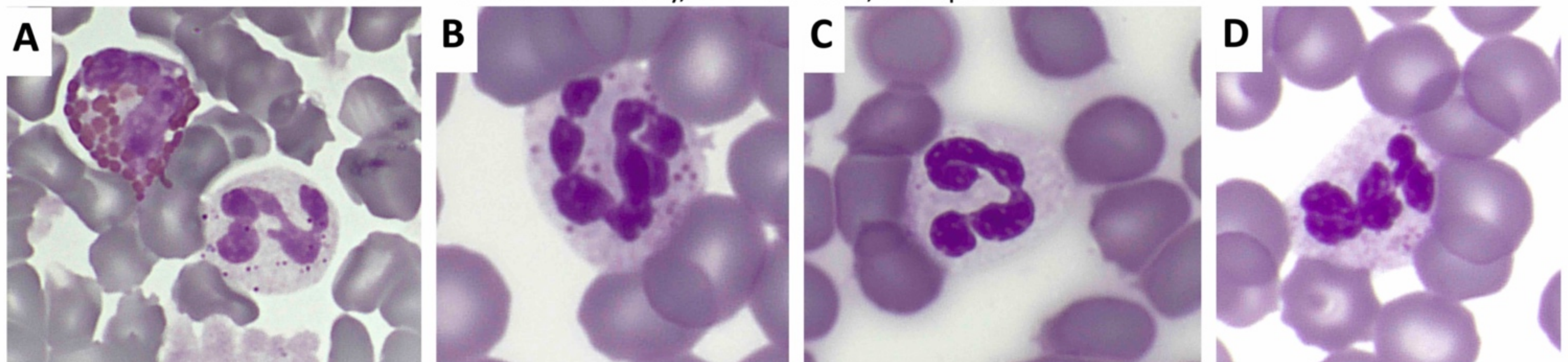


Figure 1: Examples of intracytoplasmic granules in PMNs of FB stained with MGG: granules may be multiple and thin (A, in the PMNs at the right of the eosinophil), or slightly larger (B). In some dogs, granules are rare and inconspicuous (C) and occasionally tends to form small aggregates (D).

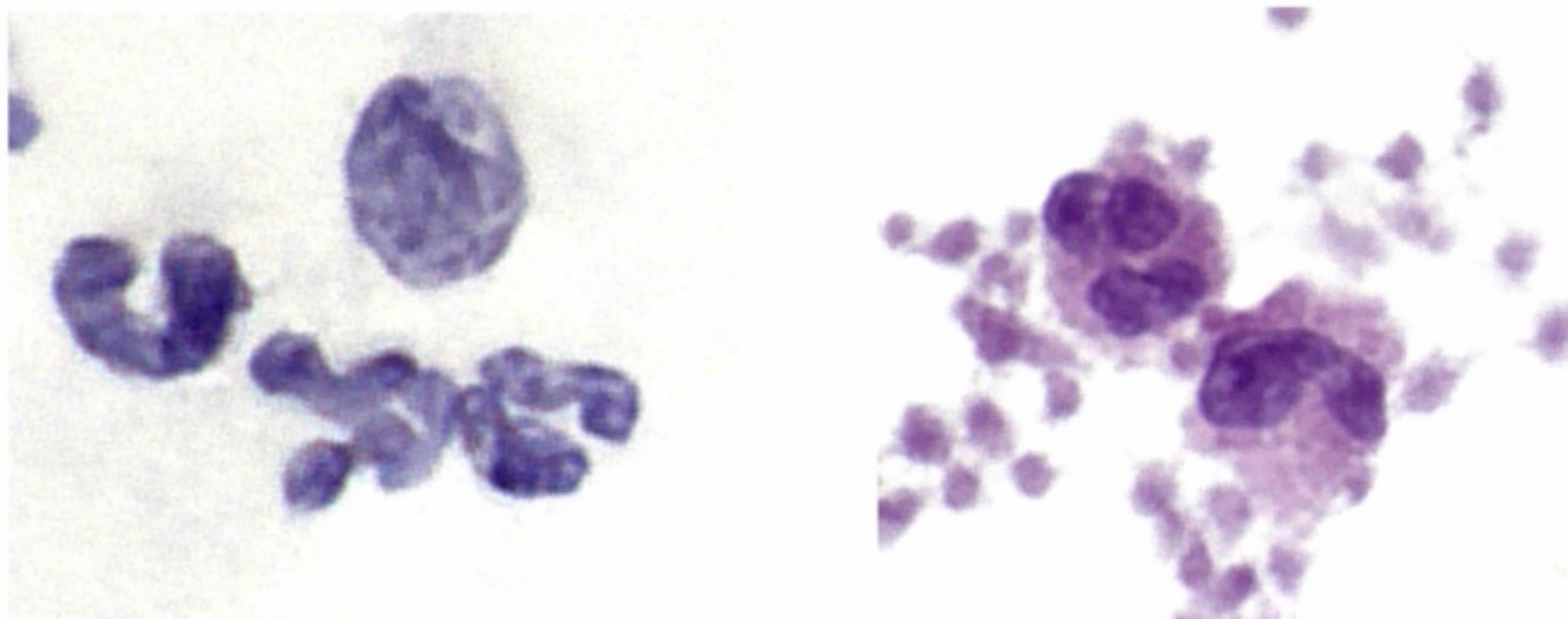


Figure 2: PMNs stained with TB did not show intracytoplasmic granulations

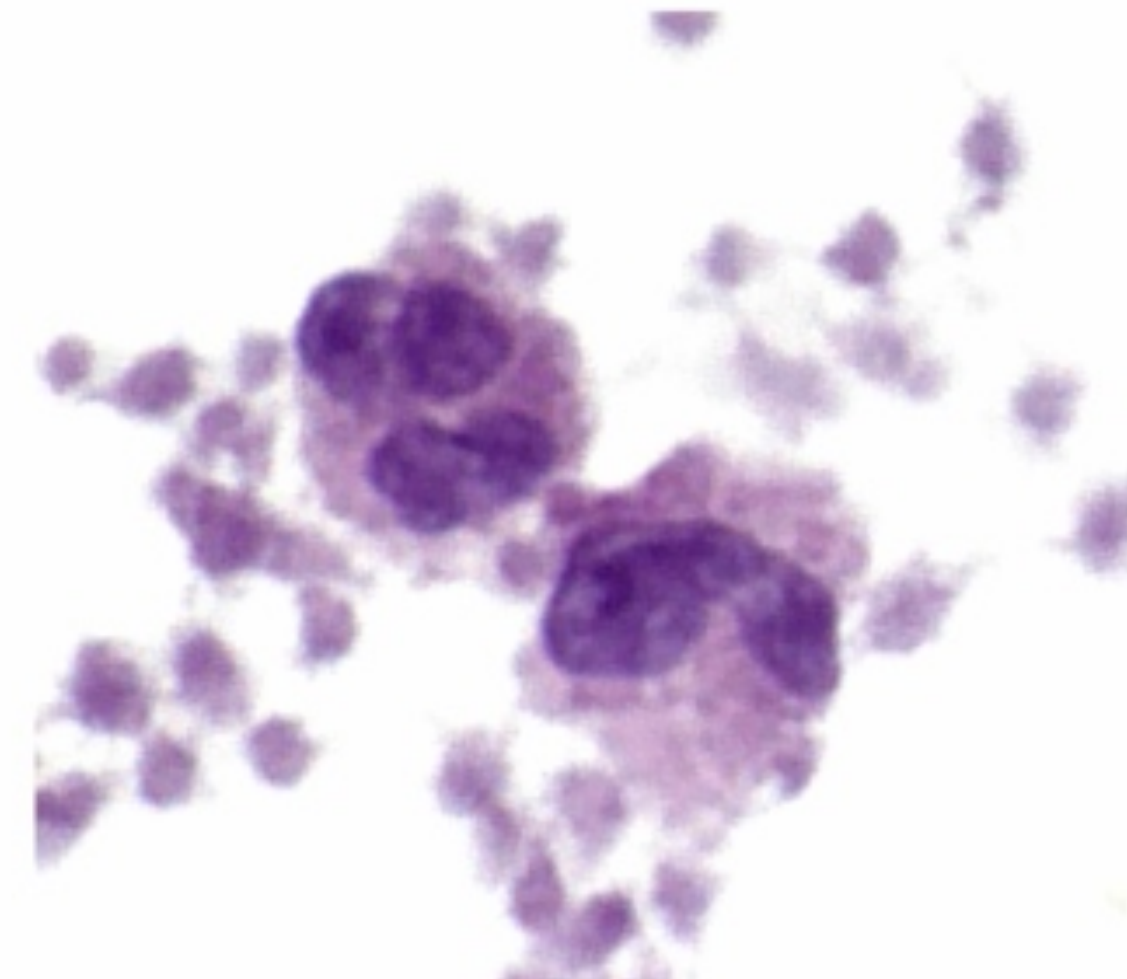


Figure 3: PMNs show the normal diffuse intracytoplasmic PAS positivity

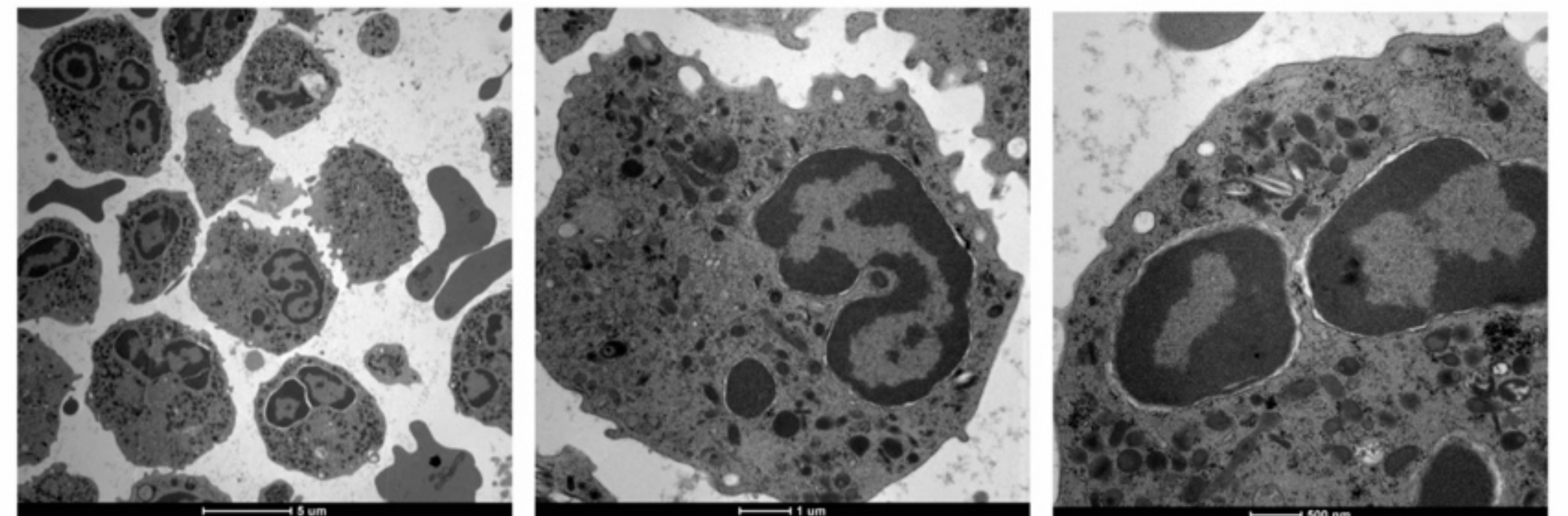


Figure 4: Multilobed nuclei of the neutrophils are apparent in three images. The primary, azurophilic granules are larger and rounder than the secondary specific granules

Dog ID	Age	Sex	Clinical signs	Other lab abnormalities
1	4 y	m	Unknown	Unknown
2	2 y	m	Unknown	Unknown
3	6 y	f	Unknown	Unknown
4	6 y	m	Head tilt	Unknown
5	2 y	m	Unknown	Mild elevation of balpha-2-globulin
6	1.5 y	f	Unknown	neutrophilic leukocytosis, regenerative anemia
7	1 y	m	Unknown	None
8	4 y	f	Healthy	None
9	8 y	f	Urinary incontinence, PU/PD. In the past cystitis, uroliths and ectopic urethere	Thrombocytosis
10	8 y	m	Weight loss, low appetite	Mild hyperazotemia and hypoalbuminemia, mild thrombocytosis
11	6 y	m	Acral lick dermatitis, corneal ulcer	None
12	2 y	m	Healthy	None
13	3 y	f	Unknown	None
14	1.5 y	f	Unknown	None
15*	9 y	f	Spinal cord compression, chronic enteropathy in therapy, hiatal hernia	Thrombocytosis, mild hypercholesterolemia
16	0.5 y	m	Chronic enteropathy (severe). In the past parvovirus infection	Unknown
17	6 y	m	Nausea, slow intestinal peristalsis, altered parenchimal spleen	Mild hyperchlesterolemia, Spleen lymphoid hyperplasia
18	0.5 y	m	Unknown	Unknown
19	3 y	f	Healthy	Thrombocytosis
20	4 y	m	Mast cell tumor	None
21	9 y	m	PU/PD	Unknown
22	6 y	f	Unknown	Unknown
23	1 y	m	Unknown	Unknown

Table 1: Signalment and clinical and laboratory information of the 23 dogs included in the study. Y=years; m=male; f=female *dog sampled twice over the study period

The age of the dogs ranged from 6 months to 9 years; 13 were males and 10 females. All the dogs but one lived in central-northern Italy, but no genetic relationship was determined. Three dogs exhibited thrombocytosis and one had neutrophilia. Clinical records were available for 12 dogs (3 healthy, 2 each with PU/PD, neurological signs, chronic enteropathy; 1 each with dermatitis, mast cell tumor, weight loss).

CONCLUSION: Intracytoplasmic granules are identified in PMNs of FB. This finding is uncommon, as it was found in a small number of cases compared to the total number of FB blood samples analyzed in the same period (approximately 2,000 samples). The presence of these granules does not seem to be associated with specific disease and their exact nature remains unknown. Further studies should be addressed to investigate the prevalence of this condition in FB, the possible genetic relationship of affected dogs through a detailed pedigree analysis, and the chemical nature of the granules through additional stains