

CONTACT POINT

Proton pump inhibitor–induced vitiligo following airborne occupational sensitization

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The literature reports that proton-pump-inhibitor (PPI)–induced adverse skin reactions are mostly instances of immunological and PPI-related occupational contact dermatitis after direct contact or airborne exposure.¹ Although there are few cases of vitiligo after the ingestion of oral PPIs,² vitiligo after airborne PPI exposure has yet to be reported.

CASE REPORT

A 36-year-old man presented with recently developed hypopigmented patches on the forehead, periocular area, and neck (Figure 1A). He

described his condition as ongoing symptoms of erythema with swelling of his eyelids during his work (Figure 1B). He had worked for a year in the pharmaceutical industry and was involved in the manufacturing of PPIs, including pantoprazole and rabeprazole. He was exposed to PPI powder, although he wore protective gear such as gloves and a mask, but not goggles, during the manufacturing process. He had no relevant medical or family history. A Wood's lamp examination showed accentuation of the affected lesions.

A skin biopsy from his nape showed a complete loss of melanin and melanocytes, confirming the diagnosis of vitiligo, and immunohistochemical studies revealed primarily inflammatory CD8+ T cells infiltration into the lesional skin (Figure S1). A patch using pure pantoprazole

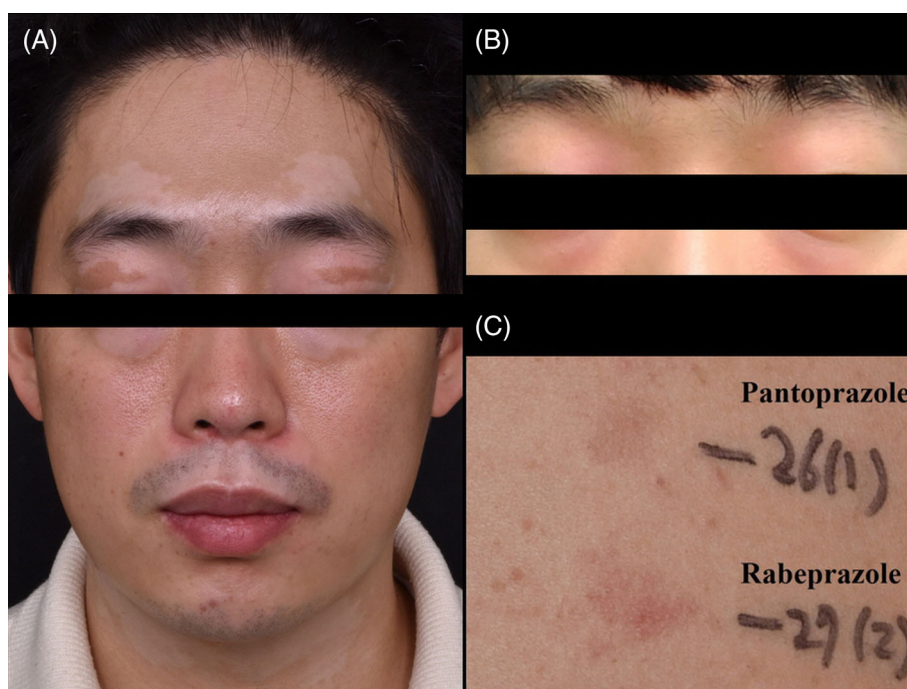


FIGURE 1 Clinical findings of protein pump inhibitor (PPI)–induced vitiligo: (A) Depigmented patches on the forehead, periocular area, and neck. (B) The patient experienced erythema with swelling and itching on the exposed facial skin during his work. (C) An image of patch testing on day 4. A patch test using pure pantoprazole and rabeprazole powder diluted 1% in petrolatum showed sensitization to PPIs. (Upper: pantoprazole, Lower: rabeprazole)

and rabeprazole powder diluted 1%² in pet. showed sensitization to PPIs (Figure 1C). The patient is undergoing phototherapy and has stopped working on the manufacturing of PPIs. These efforts resulted in no further spread of depigmentation upon 2-month follow-up.

DISCUSSION

Chemical-induced depigmentation is referred to as “chemical-induced vitiligo” as a major subset of the vitiligo spectrum rather than “chemical leukoderma.”³ Depigmentation from chemicals may be associated with an initial instance of allergic contact dermatitis and appears to be due to the activation of melanocyte-specific autoimmunity, as also seen in non-chemically-induced vitiligo.³ Pantoprazole and rabeprazole, which are members of a highly sensitizing group of chemicals, may cause an airborne pattern of contact dermatitis.^{1,4} This inflammation can subsequently lead to the Koebner phenomenon, which can result in the occurrence of vitiligo in people with genetic susceptibility. Our case serves as an additional example of chemical-induced vitiligo, either direct exposure or airborne allergic contact dermatitis to PPIs. The actual mechanism of melanocyte loss in our patient is thought to be PPIs initially absorbed into skin by airborne exposure, leading to sensitization and then melanocyte loss by cytotoxic and autoreactive CD8⁺ T cells. Previous study² reported a potential melanogenesis-inhibitory effect of PPIs by reducing melanin content and tyrosinase activity levels in melanocytes and by inhibiting H⁺/K⁺ -ATPase at the melanocytic cytoplasmic membrane. However, these explanations cannot explain PPI-induced vitiligo fully because the key pathogenesis in vitiligo is the loss of melanocytes rather than decreased melanin production. Herein, we suggest that PPIs most likely lead to the apoptosis of melanocytes by modifying the pH gradient and enhancing oxidative stress in melanocytes, possibly resulting in melanocyte-specific autoimmunity.⁵

In summary, this case highlights the first report of PPI-induced vitiligo from occupational exposure and the potential of PPIs to augment melanocyte-specific autoimmunity.

CONFLICT OF INTEREST

The authors declare no conflict of interests.

AUTHOR CONTRIBUTIONS

Dong Chan Kim: Conceptualization; data curation; investigation; project administration; resources; validation; writing-original draft.

Heeyoung Kang: Conceptualization; project administration; resources; supervision; validation; writing-original draft; writing-review & editing.

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SUPPORTING INFORMATION

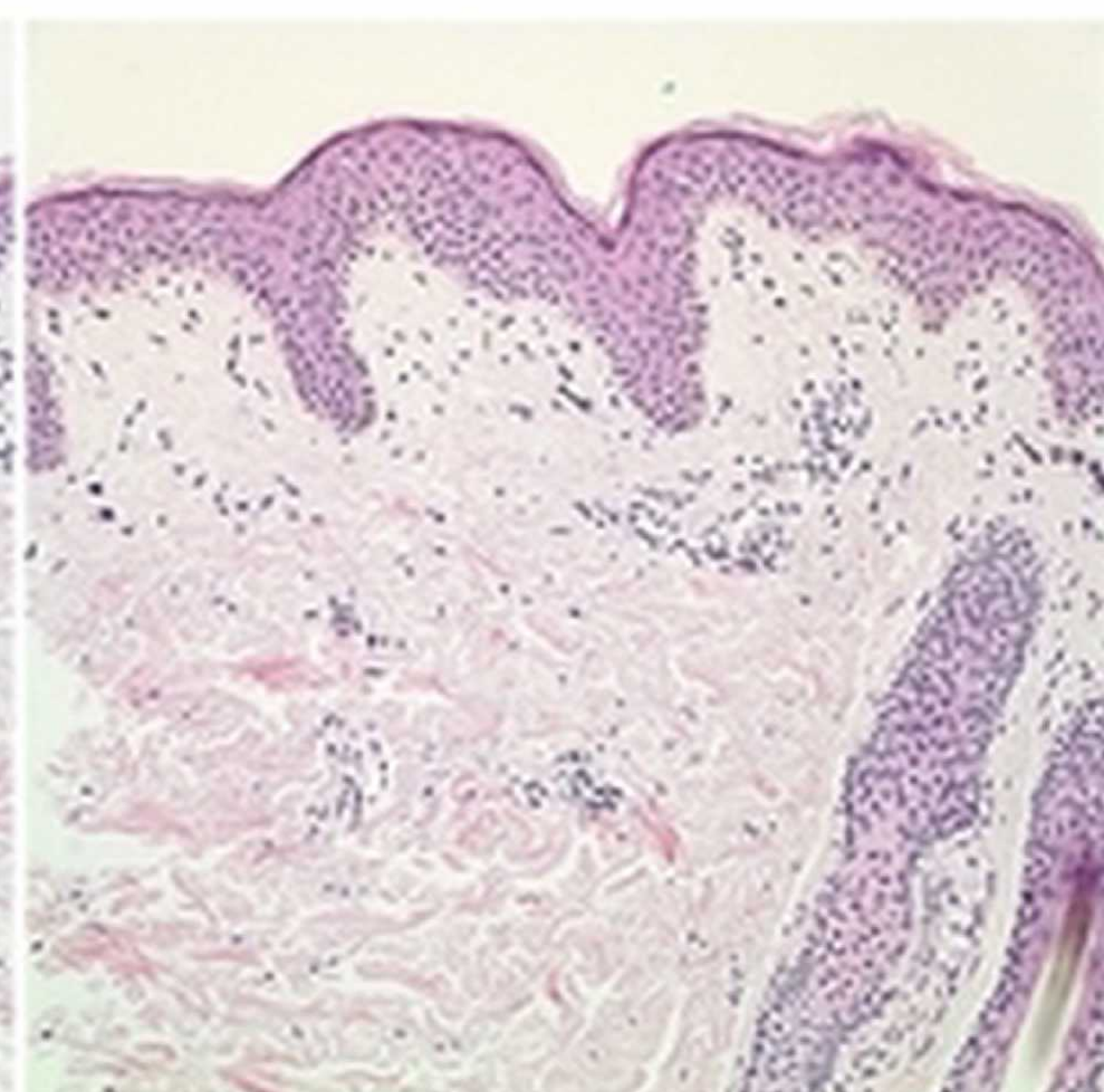
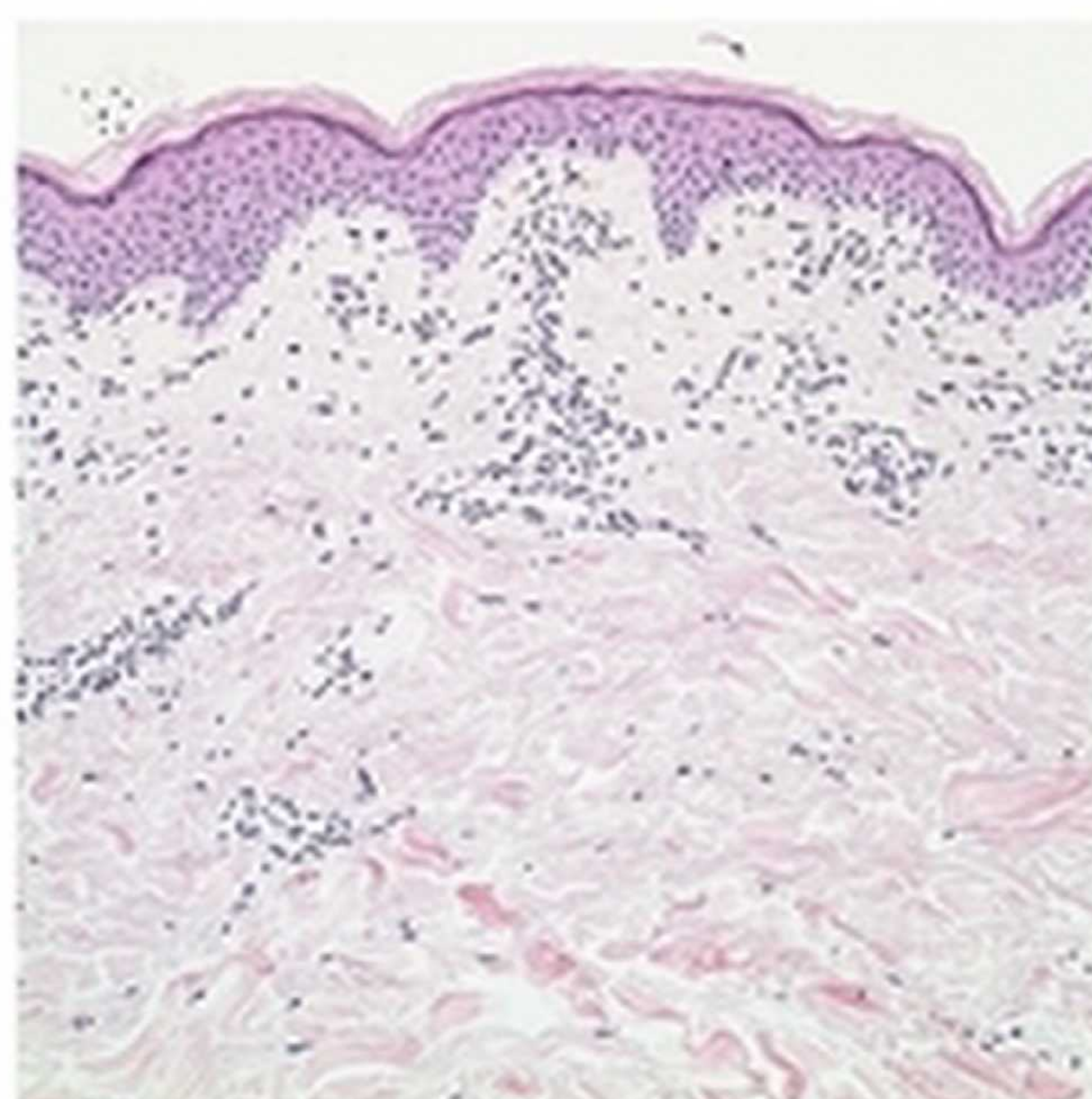
Additional supporting information may be found online in the Supporting Information section at the end of this article.

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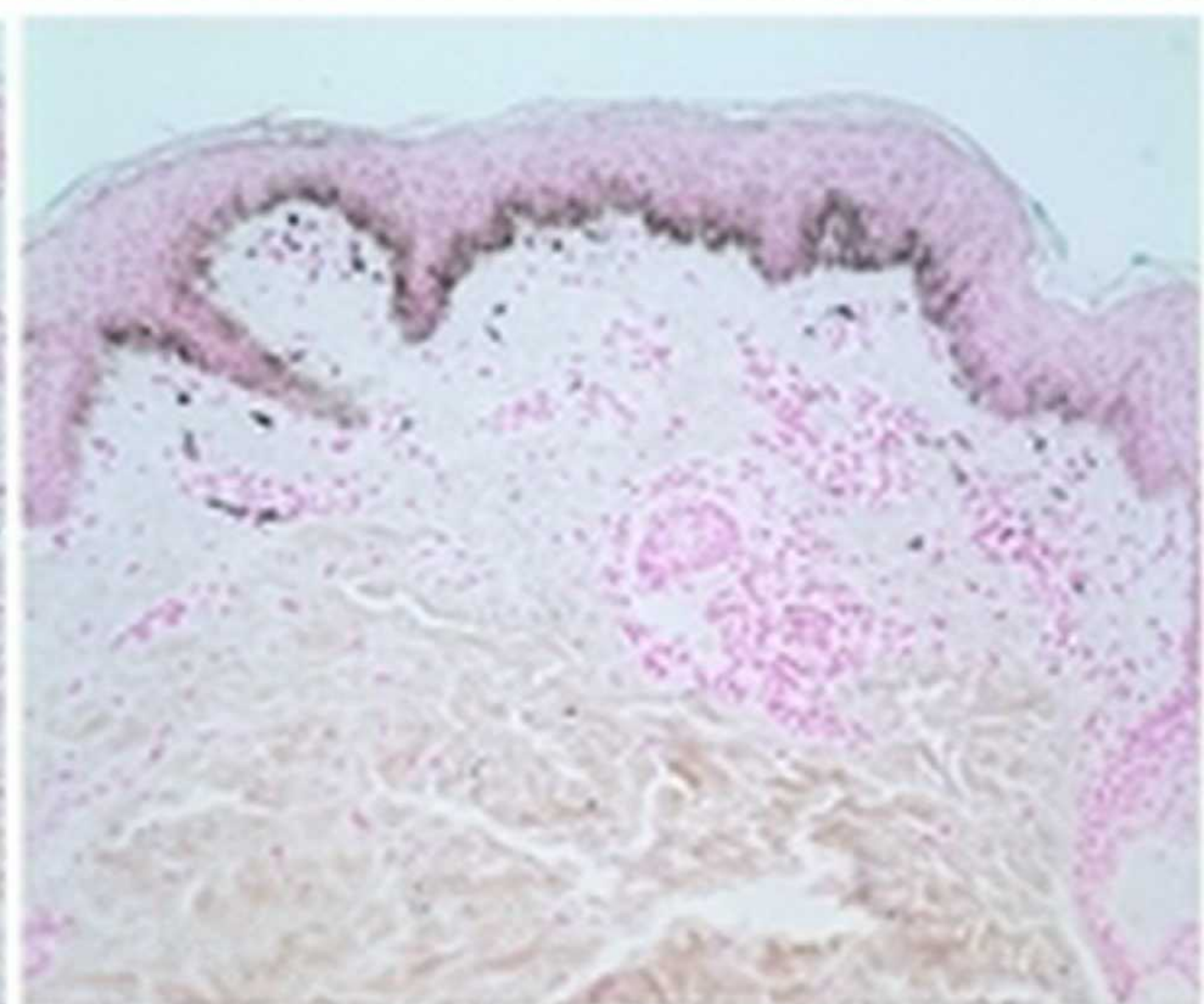
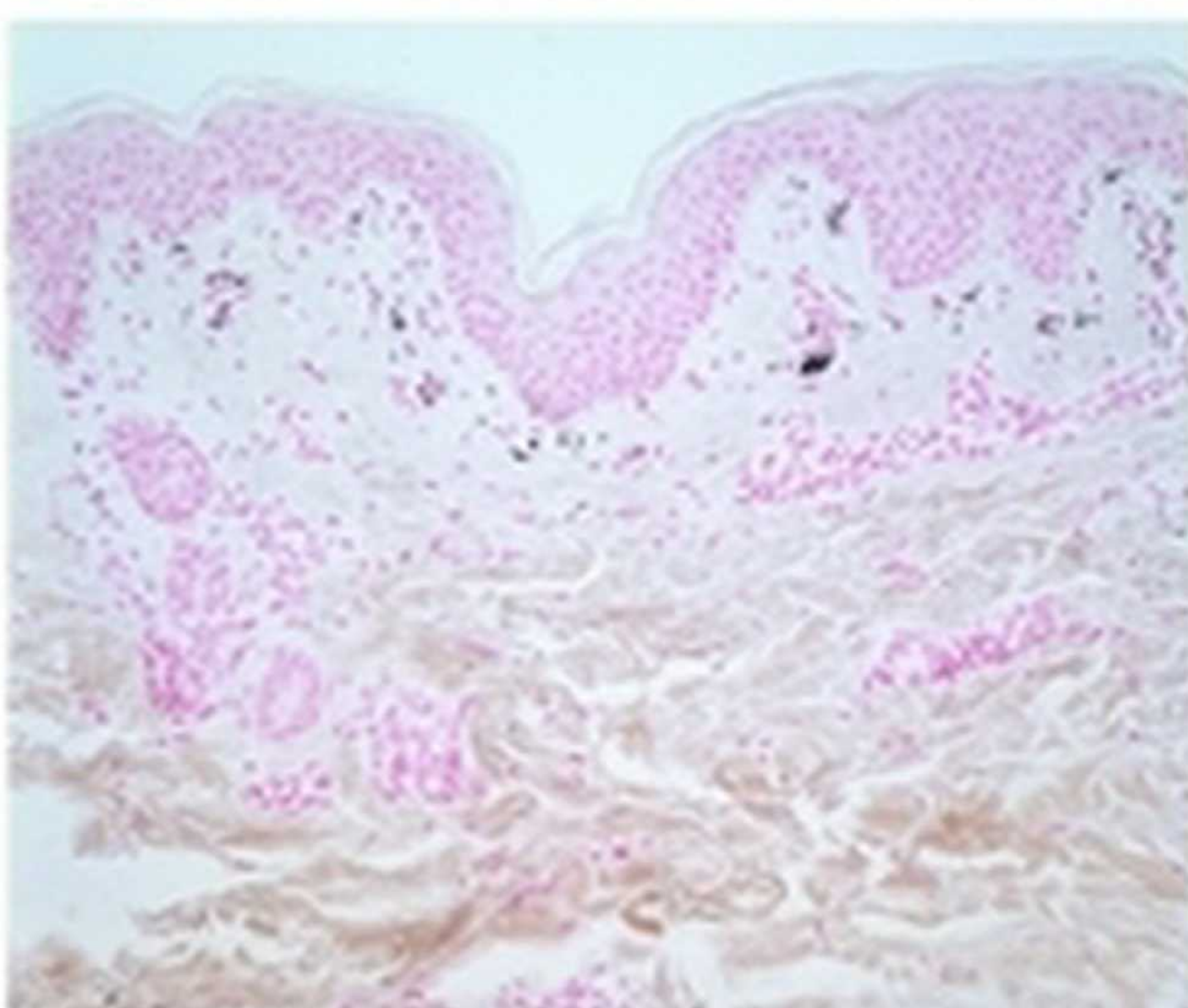
Vitiligo lesion

Perilesional area

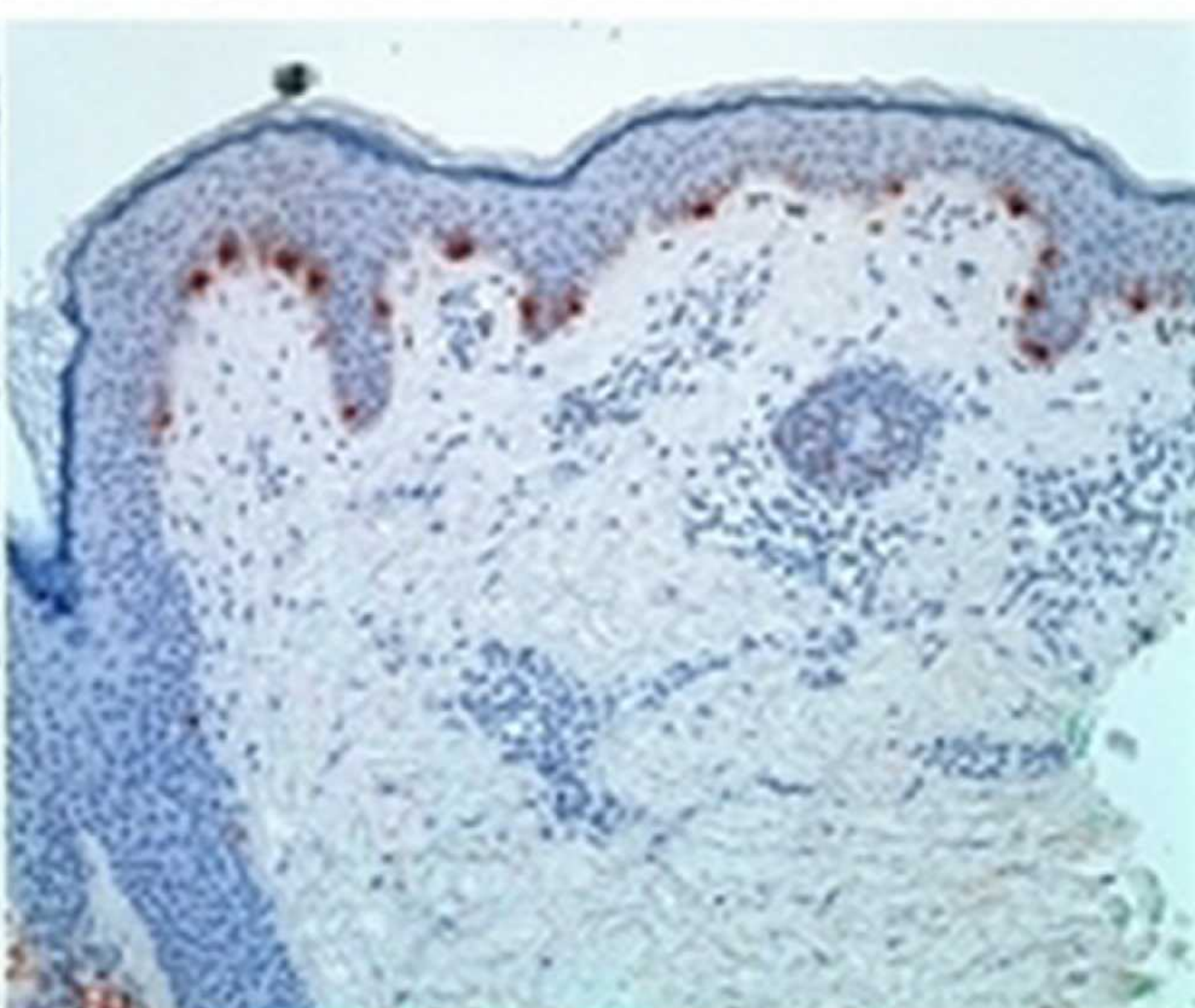
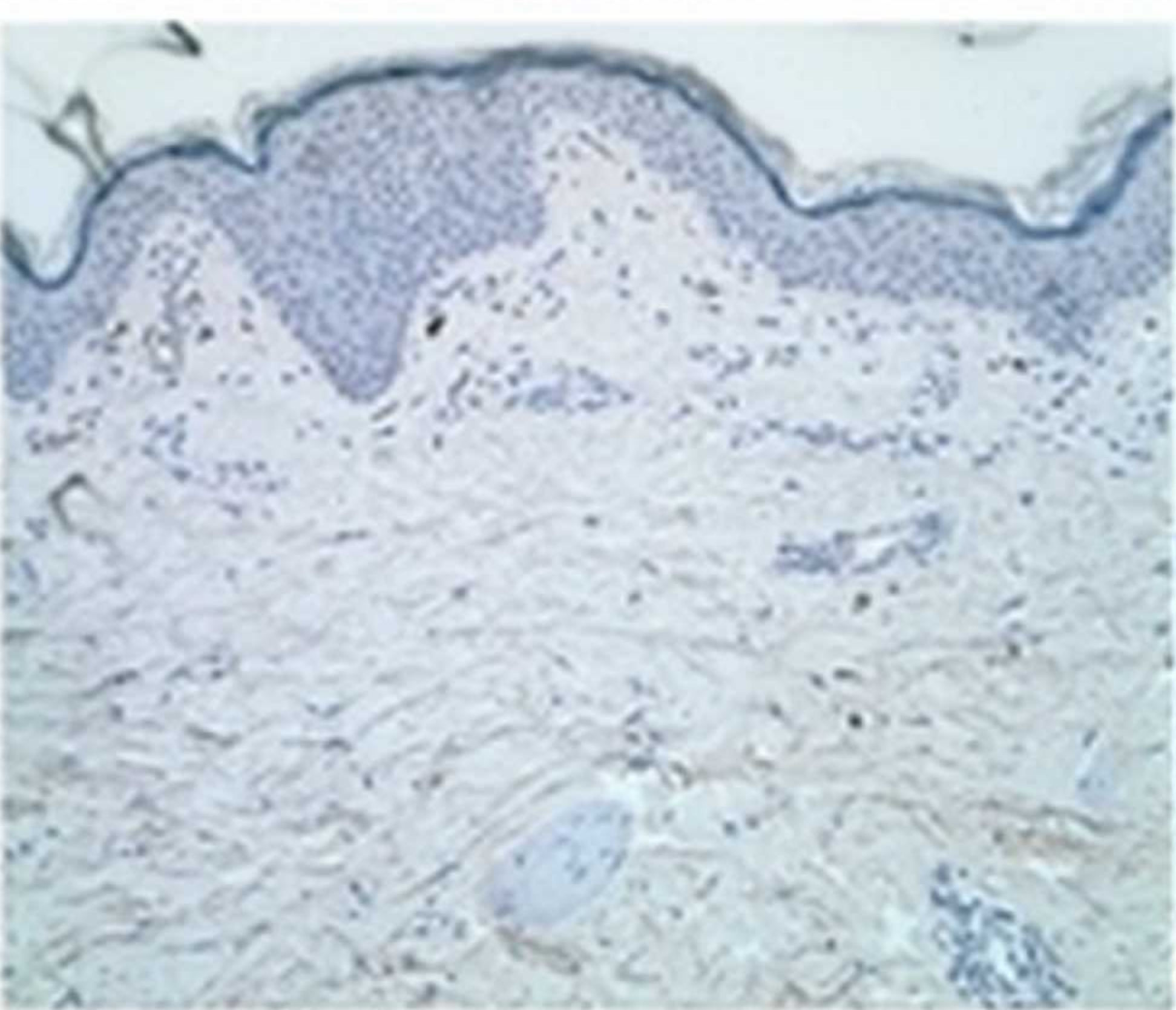
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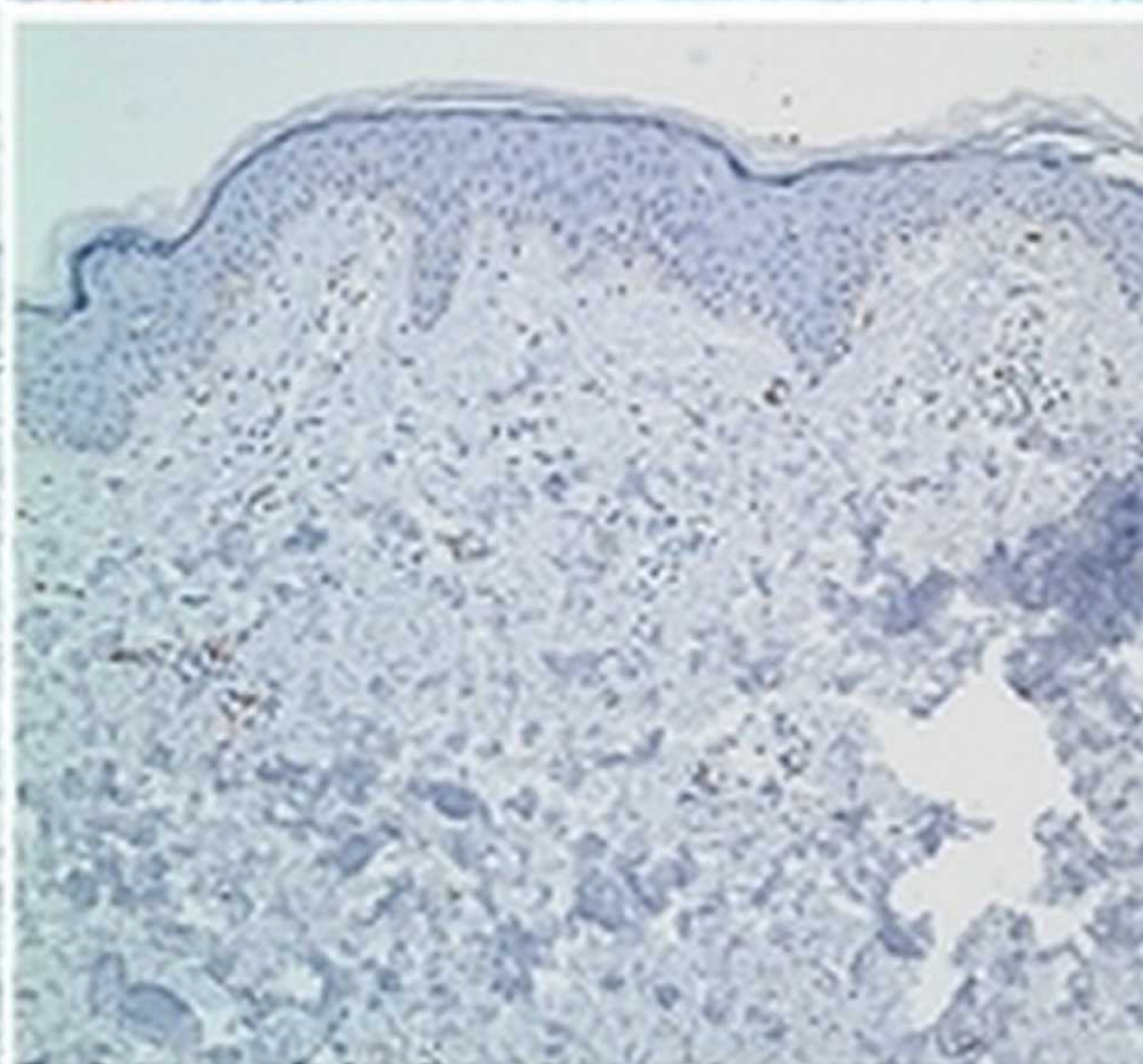
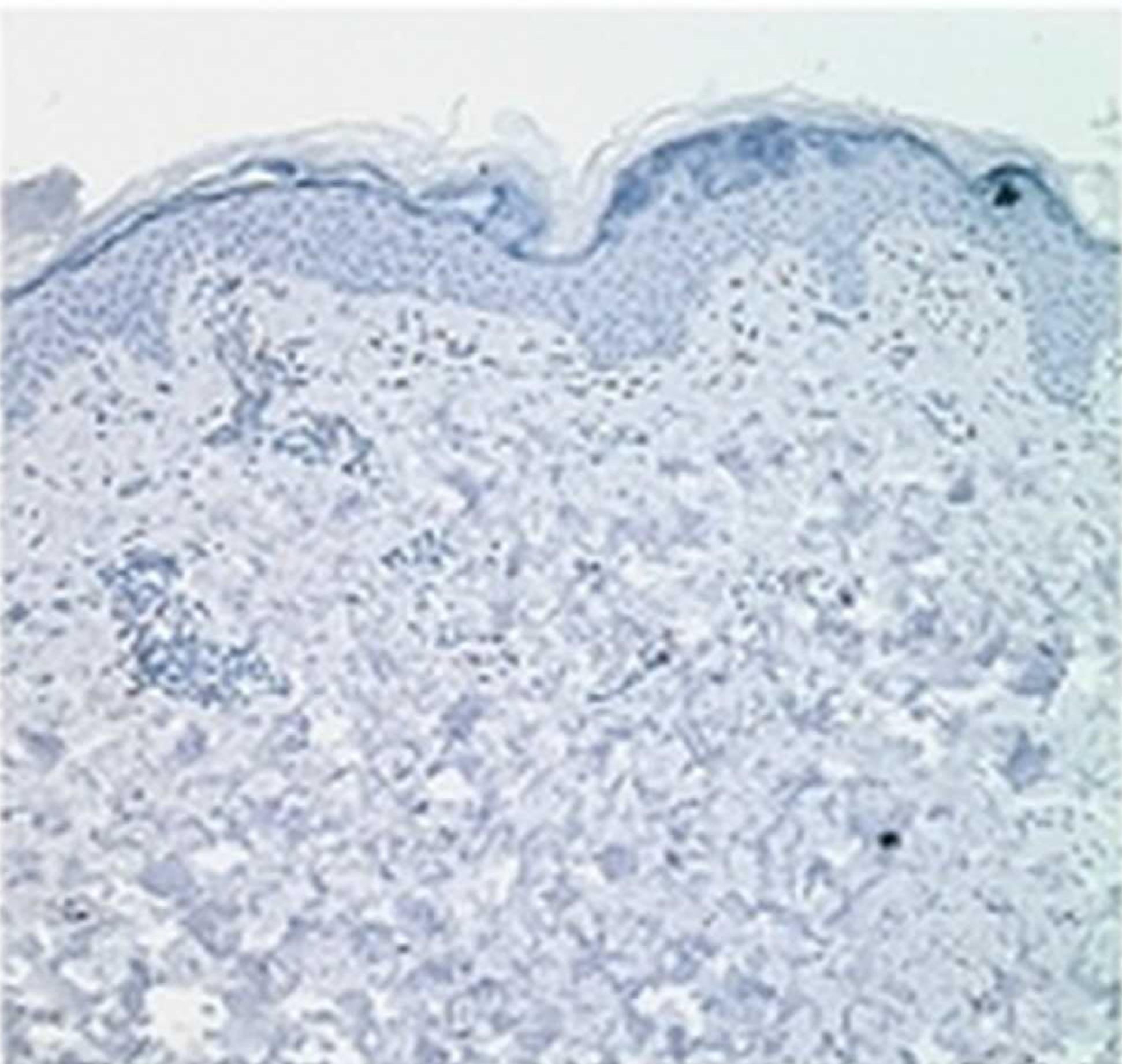
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NKI/beteb



CD4



CD8

