

## Scanning Electron Microscopy Of Corrosion Casts In The Animal Model Of Atopic Dermatitis.

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Atopic dermatitis is a common chronic inflammatory pruritic skin disease with a lifetime prevalence of 10–20% in children and 1–3% in adults. Over the past three decades, the prevalence of atopic dermatitis has increased two to threefold [1]. We have previously established an animal model of atopic dermatitis, by transgenic expression of IL-4 by keratinocytes in the skin [2]. The IL-4 transgenic mice developed an inflammatory skin disease that fulfills the diagnostic criteria of human atopic dermatitis clinically and histologically [2]. We examined the skin vasculature using corrosion casts of the ears. The non-transgenic mice scanning electron microscopy of vascular casts showed an organized hierarchy of the blood vessels, with regular branching pattern of arteries, capillaries, and veins. The posterior auricular artery branched to the marginal artery, and the capillaries connected to the marginal vein. The arteries, easily discernable by their longitudinal endothelial nuclear impressions [3], were often contracted with longitudinal folds and a somewhat rough surface. Capillaries were in a narrow plane and scarcely covered the tissue that enclosed them. The veins, identified by their round endothelial nuclear impressions [3], had a smoother surface; the marginal vein coursed on the margin of the pinna (figure 1). In the transgenic mice before disease onset, casts showed a low density and well organized framework similar to the non-transgenic mice. The venules were characterized by a smooth surface, however, buddings (arrows) along their surfaces were observed (figure 2). Near the muscle layer around the base of the ear, cast lymphatics were seen. In mice with early (figure 3) and late disease (figure 4), the cast blood vessels were drastically different from the non-transgenic group. The blood vessel hierarchy was disorganized, and the capillaries' density was much greater covering the entire microscopic field. Capillaries had more blind endings that were mostly bulbous (sprouts). A remarkable variation in shape and size was noted, along with a characteristic roughened surface of the cast capillaries. Lymphatics, which have a separate and distinctive form were also found [4]. Occasionally holes of intussusception [5] and sprouting vessels were seen within the cast vessels. Our scanning electron microscopy findings are suggestive of an angiogenesis process in this animal model, a novel finding in atopic dermatitis.

### References:

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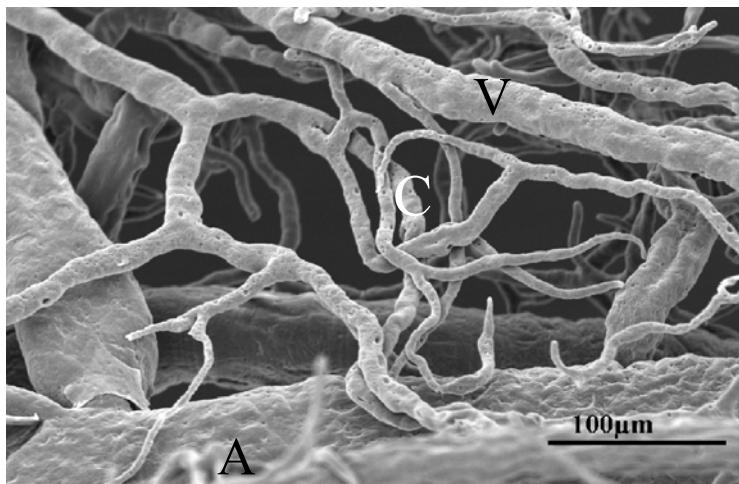


Figure 1

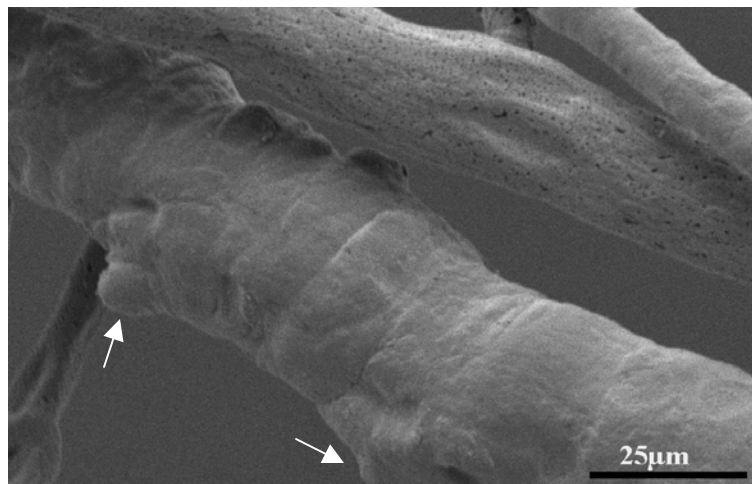


Figure 2

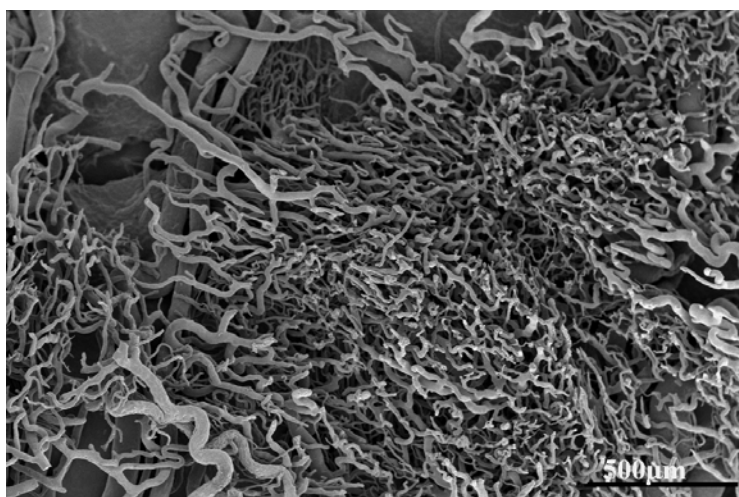


Figure 3

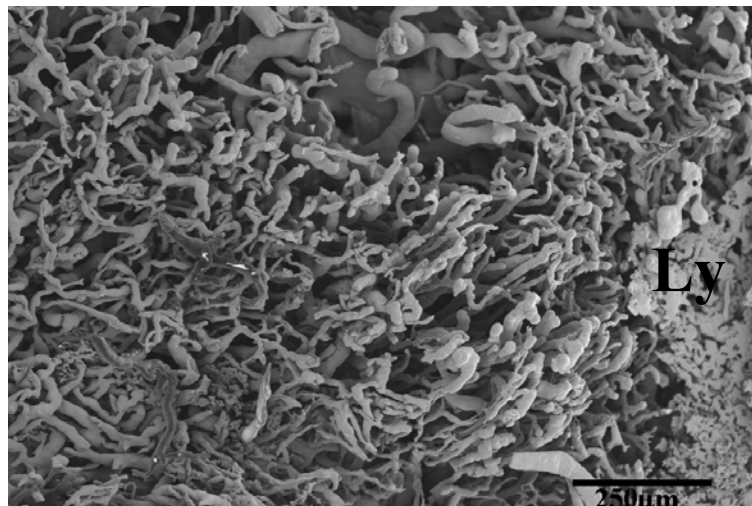


Figure 4

Figure legends:

Figure 1: Cast blood vessels of non-transgenic mice are organized. Arteriole (A), capillary (C) and veins (V) are seen.

Figure 2: Blood vessels of IL-4 transgenic mice before disease onset. Note protrusions (arrows) along vein surface.

Figure 3: Cast microvasculature in the early lesion. There is an excess and disorganization of capillaries.

Figure 4: Endocasts in the late lesion group. There is an increased density and heterogeneity of capillaries. Note the variation in size, shape and direction of capillaries. Cast lymphatics (Ly) are seen.