

Isolated Osteoclasts: Scanning Electron Microscopy

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Although scanning electron microscopy (SEM) made possible the study of whole cells, osteoclasts were only studied "in situ" [1, 2] whereas there is no description of isolated osteoclasts using this method. We present here the study of osteoclasts isolated from the external surface of metaphysal area of the tibia of 15-day-old rats. They were obtained by imprints following Walker's technique [3]. The samples were fixed in glutaraldehyde 2.5% in buffer phosphate pH 7.4, critical-point dried, carbon-gold coated and observed by SEM. Positive histochemical demonstration of succinic-dehydrogenase and acid phosphatase corroborated the osteoclastic nature of giant cells present in imprints [4, 5]. SEM of isolated osteoclasts showed a big and very irregular shaped body with many long, thin processes (Fig. 1). The cellular body measured between 70–160 μm in length and 30–70 μm in width. Cell processes are 1 μm in diameter with oval knots of 2 $\mu\text{m} \times 1.5 \mu\text{m}$ separated from one another by 6–8 μm . Identical knots to those found in isolated osteoclasts and short fibrils oriented towards the bone surface were observed in cell processes of osteoclasts "in situ" (Fig. 2). Apart these two structures not previously described, the general aspect of osteoclasts "in situ" was

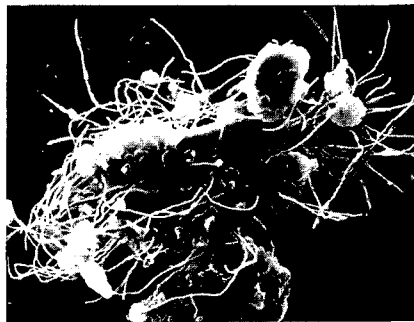


Fig. 1. Whole isolated osteoclast showing long and thin cellular processes arising from all areas of its body. 6000 $\times$



Fig. 2. Several oval knots (arrow) appeared at 6–8 μm intervals along the cell processes. 9000 $\times$

similar to that described in [1]. These long and numerous processes could play a role in bone resorption, acting as metabolic channels for substances, which might be able to produce direct or indirect effects on bone matrix destruction. The easy morphological identification of isolated osteoclasts by SEM apart making measurements possible would contribute to further studies in order to clarify the controversial role of osteoclasts in the mechanism of bone resorption [6].

The observations were made in a Scanning Electron Microscope JEOL-S25 from the Facultad de Odontología, Universidad de Buenos Aires.

Received March 19, 1982

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