nism for controlling and triggering the destruction of secretory material[39,40]. Extrapolation of the present results to other endocrine glands would mean that their specific granules share with lysosomes not only structural features but also functional properties.

Résumé. Le rouge neutre ou l'euchrysine 3R, deux substances fluorescentes qui se concentrent sélectivement dans les lysosomes de divers types de cellules, a été administré à des rats normaux ou à des rats en carence sodée. Comme l'ont démontré la microscopie de fluorescence et la microscopie électronique, les deux substances se sont accumulées dans les granules des cellules juxtaglomérulaires du rein.

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Lung Inclusion Bodies: Different Ultrastructure in Simian and Non-Simian Mammals

The lamellated osmiophilic inclusion bodies (LOPBs) in the Type II cells of the lung are the source of pulmonary surfactant[1]. We report differences in structure and organellar origin between bodies from man and monkeys, and those from non-simian mammals.

We have studied the bodies in Bennett's Wallaby (*Protomnodon rufogrisea*), mouse, rat, hamster, guinea-pig, rabbit, cat, tree shrew (*Tupaia belangeri*), mouse lemur (*Microcebus murinus rufus*), squirrel monkey (*Saimiri sciurea*, a New World species), and rhesus monkey. We have also studied 2 specimens of human lung of normal appearance, 1 from a lobectomy and 1 from an accident case, and 4 specimens from infants dying of the respiratory distress syndrome of the newborn (RDS). We use glutaraldehyde and osmium fixation, post-fixation with lead ferricyanide solution with the anion 5% in

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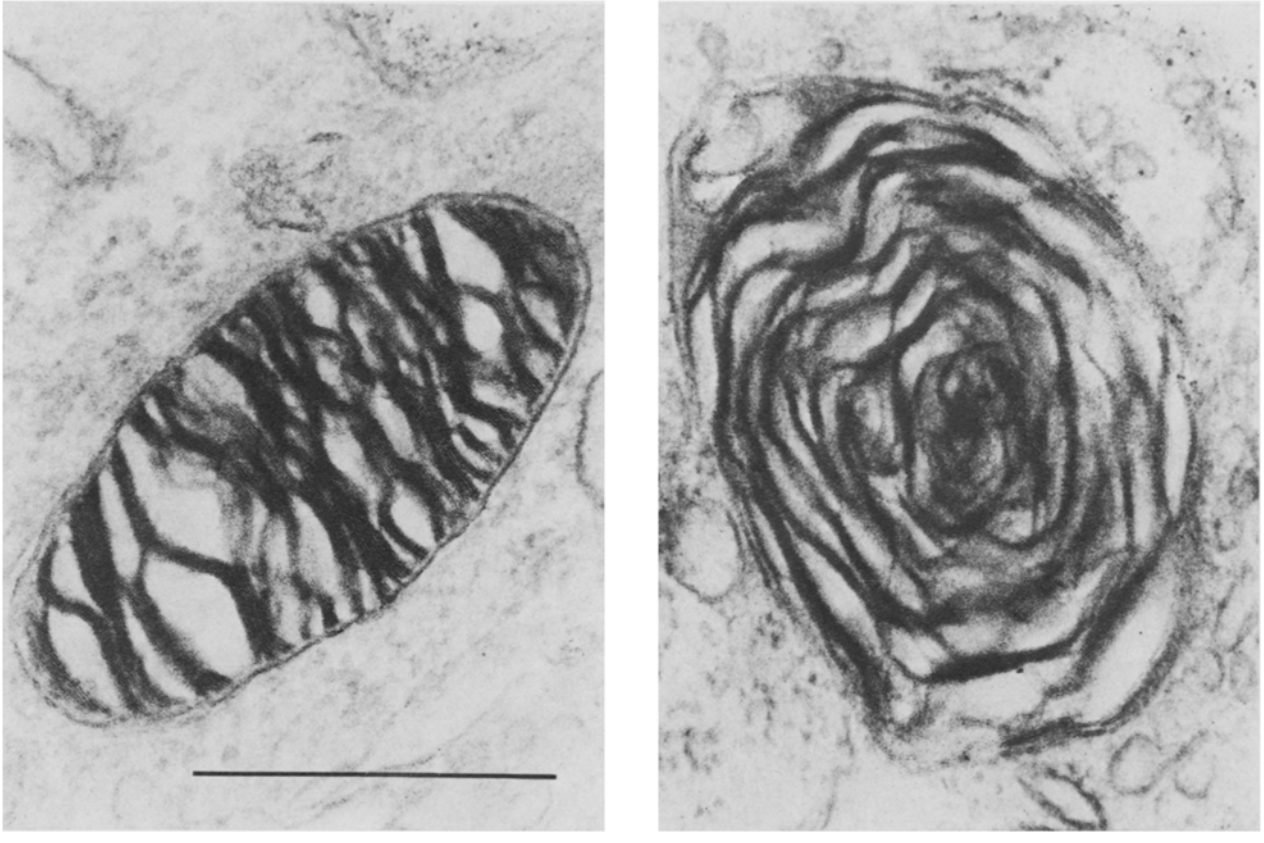

Left. Cross-barred lamellated osmiophilic body from mouse lung. Glutaraldehyde – osmium – lead ferricyanide fixation, acetone-Araldite embedding. Scale bar 500 nm. Right. Concentric LOPB from lung of squirrel monkey. Same preparation method and scale.

excess, and Araldite embedding with acetone as dehydrator and thinner[2]. These methods preserve the bodies, which are eroded by alcohol and epoxypropane.

In normal lungs of the non-simians, about 75% of LOPBs with recognizable structure consist of lamellae, 20 to 100 nm thick, which form, in section, straight or arcuate cross-bars, with lines at 4 nm spacing within them; these meet the periphery at right or acute angles[3]. There is generally a single bounding membrane, separeted from the 4 nm lines by a space of nm or more (Figure, left). Similar LOPBs exist in the hedgehog (*Erinaceus europaeus*)[4], and in the dog[5]. We have taken multiple serial sections which show that the lamellae composing this type of body are flat or dome-shaped throughout, and that the sections showing straight cross-bars are not produced by axial sectioning of a scroll or of a body composed of cylindrical sheets. The few (10%) LOPBs showing concentric bands in section, in non-simian lung, may be explained as sections cut through a body with domed lamellae, at right angles to the axis of the dome. About 1 LOPB in 10 shows signs of origin from a multivesicular body[6]. Extracellular osmiophilic bodies are found in the alveolar spaces of mature foetal lung (human and non-simian), and sometimes in adult lung; they are, if of recognizable shape, always concentric, and appear to be formed by curling up of strips of osmiophilic material extruded through openings in the cell membrane, not by release of intact LOPBs, from the cells. We have found no sign of the species differences which have been reported to exist[7] between the LOPBs of some of the non-simians.

Bodies containing osmiophilic whorls associated with mitochondrial cristae, and possibly transitional between mitochondria and LOPBs, are rare in untreated animals. They are found under conditions of stress[8], and we have found them in a premature (28 day) rabbit after $4^1/_2$ h breathing; a double bounding membrane is present.

The LOPBs of man and of the monkeys examined are quite different from those of the non-simians. They are mainly concentric (Figure, right) with thinner lamellae, which often contain only two 4 nm layers. It is difficult to trace a continuous bounding membrane; this suggests that they are not of mitochondrial origin. Their real organellar origin is not clear, but their structure would be compatible with formation by fusion of the walls of flattened vesicles of rough endoplasmic reticulum, followed by winding into a scroll. This has been illustrated from the human fetus[9], and we have found traces of it in the fetal and newborn mouse. In the adult simians the cross-barred or arcuate bodies appear to be absent; the literature[10], where it shows the details of LOPBs of human origin, agrees. Rather similar concentric bodies appear in the chick[11]. In RDS, concentric LOPBs are found, though in smaller numbers than in adult lung, in line with the deficiency of surfactant in this condition[12]; one arcuate body of non-simian type has been seen. Multivesicular bodies are rare in simians. The morphological differences described here may be connected with the biochemical differences reported by GLUCK et al.[13], who consider that humans have an additional pathway for surfactant synthesis which assists survival in the event of premature birth.

Résumé. Les inclusions lamellaires des cellules du second type du poumon sont la source de la substance tensioactive. Chez l'homme et les singes de l'ancien et du nouveau monde, ces inclusions sont de forme concentrique et peuvent provenir du réticulum endoplasmique. Chez d'autres mammifères, y compris un lémurien, elles ont, pour la plupart, des barres rectilignes ou arguées et proviennent des corps multivesiculaires.

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Catecholamines in Human Fetal Heart

The heart of adult mammals has been observed to have an extensive adrenergic nerve supply, and catecholamine-containing cells have been found in the atrial myo- and epicardium[1–4]. Organs composed of small catecholamine-containing cells, which receive their vascular supply directly from the coronary arteries, have been described[5]. These organs, called aortic and pulmonary bodies, are situated in the wall of the main arterial trunks and they are considered homologous with the carotid bodies[6].

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