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## Autoperfused Heart-Lung Preparation

A Structurally Appropriate Experimental Model for the Metabolic Study  
of the Isolated Lung

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*Abstract.* This study was carried out to confirm the hypothesis that an autoperfused heart-lung preparation provides a favorable situation to analyze the dynamics of the biosynthesis of alveolar surface-active material, because the model did not produce any significant changes in the structure of the lung. Light and electron microscopy confirmed the absence of pulmonary lesions throughout the whole time of perfusion. A relevant finding was the periodic delamination of the type II pneumocytes observed ultrastructurally, which coincided with the data obtained from the study on  $^{14}\text{C}$ -glycerol-3-phosphate and  $^3\text{H}$ -palmitic acid incorporation into total lipids and phosphoglycerides from lung tissue. This confirmed that the biosynthesis of pulmonary surfactant is rhythmic and periodic. From a structural point of view, the results suggest that the autoperfused heart-lung preparation constitutes a useful method for the *in vivo* metabolic study of the isolated lung.

It is only recently that the pulmonary parenchyma has been demonstrated to have a high capacity for biosynthesizing lipids [3] and other substances [12] with surface tension properties which form part of the surface-active material (surfactant) of the alveoli [6]. Synthesis is carried out in the cytoplasm of the type II pneumocytes [8, 13]. Knowledge about this basic function of the lung and about the biochemical composition and action of the pulmonary surfactant is quite extensive today. Other as-