

# **Cytochemical and Biochemical Demonstration of an ATPase in Membranes of Human Peroxisomes**

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## **Summary**

We demonstrated a neutral Mg-ATPase activity in human peroxisomal membranes. To establish the precise experimental conditions for detection of this ATPase, both cytochemical and biochemical characterizations were first carried out in liver peroxisomes from control and ciprofibrate-treated rats. The results demonstrated an Mg-ATPase reaction in both normal and proliferated peroxisomes. The nucleotidase activity, with marked preference for ATP, was sensitive to the inhibitors *N*-ethylmaleimide and 7-chloro-4-nitrobenzo-2-oxadiazole (NBDCl). An ultrastructural cytochemical analysis was developed to evaluate the peroxisomal localization, which localized the reaction product to the peroxisomal membrane. These characteristics can help to differentiate the peroxisomal ATPase from the activity found in mitochondria and endoplasmic reticulum. The conditions established for detecting the rat peroxisomal ATPase were then applied to human peroxisomes isolated from liver and skin fibroblasts in culture. A similar Mg-ATPase activity was readily shown, both cytochemically and biochemically, in the membranes of human peroxisomes. These results, together with previous evidence, strongly support the presence of a specific ATPase in the human peroxisomal membrane. This ATPase may play a crucial role in peroxisome biogenesis.