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Unmasking and antigenic preservation using microwaves; two biological examples: PPAR and caveolin proteins

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Most studies using microwave irradiation (MWI) for the preparation of tissue samples have reported an improvement in structural integrity. However, there have been few studies on the effect of microwave (MW) on antigen preservation during sample preparation prior to immunolocalization. This report documents our experience of specimen preparation using an automatic microwave apparatus to obtain antigen preservation and retrieval. We tested the effects of MW processing vs. conventional procedures on the morphology and antigenicity of two different tissues: The brain and mammary gland, whose chemical composition and anatomical organization are quite different. We chose to locate the transcription factor PPAR β/δ using immunocytochemistry on brain tissue sections from hamsters. Antigen retrieval protocols involving MWI were used to restore immunoreactivity. We also studied the efficiency of the ultrastructural immunolocalization of both PPAR β and caveolin-1 following MWI vs. conventional treatment, on mammary gland tissue from mice at 10 days of lactation. Our findings showed that the treatment of tissue samples with MWI, in the context of a process lasting just a few hours from fixation to immunolocalization, enabled similar, or even better, results than conventional protocols. MW treatment permitted made possible the localization of PPAR β/δ in glutaraldehyde-fixed specimens, which was impossible in the absence of MWI. Furthermore, the quantification of immunolabeling for cav-1 indicated an increase in density of up to three-fold in tissues processed in the microwave oven. This study thus showed that techniques involving the use of microwaves could largely improve both ultrastructure and immunodetection.

Biography

Christine P  choux has completed her PhD in Human Biology from University Claude Bernard in 1993 and her Post-doctoral studies from University of Copenhagen (Denmark) in 1995. She is responsible from Electron Microscopy Platform at Institut National de Recherche Agronomique. She has published more than 80 papers in reputed journals and has implicated in numerous projects related to Electron Microscopy.

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