

Subcellular Processes in Plants and Animal Cells

LS.7.P196

Visualization of Benzo[a]pyrene (B[a]P) and its metabolites in live Hepa1c1c7 cells

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The uptake and intracellular distribution of carcinogenic polycyclic aromatic hydrocarbon (PAH), benzo[a]pyrene (B[a]P) was studied in Hepa1c1c7 cells using time-lapse two-photon microscopy and transmitted light microscopy. Rapid internalization of B[a]P was observed with aggregate formation near nucleus. Time-lapse imaging showed B[a]P aggregation in lipid vesicles. These lipid vesicles were characterized as lipid droplets (LDs). Time-lapse two-photon microscopy also revealed fusion events of B[a]P. In this study, distribution of several metabolites of B[a]P was also visualized using two-photon (2-P) microscopy in Hepa1c1c7 cells. Whole wavelength time-lapse imaging showed localization of B[a]P and its metabolites in lipid droplets (LDs) predominantly. In addition, one of the metabolite (1-OH-B[a]P) was found localized in the plasma and nuclear membranes of Hepa1c1c7 cells. We have also showed possible metabolism of B[a]P into its metabolites during time-lapse fluorescence imaging. 3-D image stacks of B[a]P exposed cells after 24 hours also revealed parent B[a]P stored alongside its metabolites in LDs (arrow in *Fig. 1*).

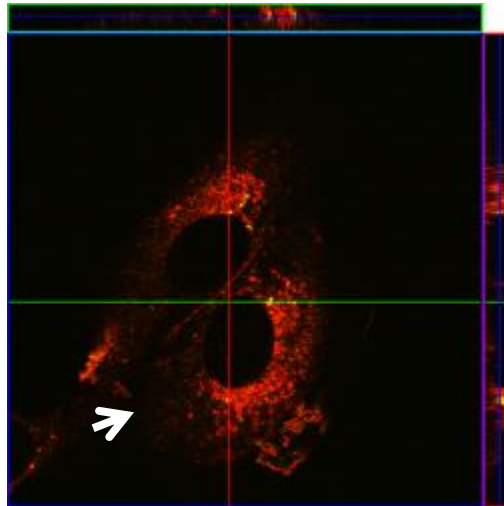


Figure 11. Orthogonal view. Ortho-view reveals B[a]P aggregates within cell cytoplasm. Scale bar, 20 μm .