# Histological characterization of in vitro shoot induction from meristematic tissue in grapevine

A. Cadavid-Labrada, L. Martinelli, C. Medina, P. Arce-Johnson

**Abstract**

Grapevine is the most important fruit species worldwide; therefore implementation of efficient regeneration systems has great relevance. Somatic embryogenesis is the most used regeneration system associated with genetic transformation in Vitis genus. However, this successful technique is limited by the long time to regenerate plants and the short phenological stage of floral tissues appropriate to initiate embryogenic cultures. Meristematic highly proliferative tissue (MPT) can be induced in vitro in different grapevine varieties using BAP induction and cutting of the apical meristems. In this work, we have evaluated the regenerative capabilities of nodal segments in the varieties ‘ Carménère’ , ‘ Cabernet Sauvignon’ , ‘ Melissa’ and ‘ Thompson Seedless’ . Culture media Murashige and Skoog at half strength (MS/2), Driver and Kuniyuki Walnut (DKWm), Roubelakis, and Cheé and Pool were used in combination with BAP at concentrations of 0.2, 0.4, 0.6, 0.8, 1.0, 2.0, and 3.0 mg/L. We found that MS/2 plus 3 mg/L of BAP induced 20, 34, and 25 shoots per explant in ‘ Cabernet Sauvignon’ , ‘ Melissa’ and ‘ Thompson Seedless’ respectively in a four months period. In Carménère more than 60 shoots were induced using the most successful treatment of DKWm plus BAP at 3 mg/L. MPTs sections from the different varieties were studied under optic and scanning electronic microscopy. Optic microscopy (OM) showed a great number of meristematic centers in these hormone-treated tissues of all varieties. Hundreds of globular shoot primordia were observed in the explants with scanning electron microscopy (SEM) a week after apical meristems cutting. Clearly defined shoots and leaves were observed with this microscopy after 30 days of cutting treatment. The great number of observed shoot primordia is important for using these tissues in transformation experiments to complement grapevine genetic breeding programs.