Synopsis of Original Research Paper

Production of bioactive compound and breeding of medicinal plants by plant tissue-cell culture —Study on *Coleus forskohlii* that produces forskolin

Yukihiro Shoyama

Faculty of Pharmaceutical Sciences, Kyushu University

The effective range of the competitive ELISA for detection of forskolin content in clonally propagated plant organs of *Coleus forkohlii* using monoclonal antibodies extends from 5 ng/ml to 5 μg/ml.

Shoot tips of C. forkohlii were cultured repeatedly on the MS medium supplemented with NAA (0.5 mg/l) and BAP (0.5 mg/l) at 25°C under the 16hr irradiation for 1 month to form multipe shoot complex. A correlation between the forskolin accumulation and the growth rate was investigated using the clonally propagated shoots. An increase of forskolin content was noted, begining at week 6. Flowers, rachises, leaves, stem, tuberous roots and roots were analyzed. Tuberous root and the stem base contained a higher amounts of forskolin than other organs. The forskolin content in the stem decreased gradually towards the top of the shoot. Quantitative determination of forskolin content in the plants cultivated in different temperature was investigated by ELISA. The temperature clearly affected the production of forskolin, demonstrating that the contents of forskolin was highest at 20°C than at 15°C and 30°C.

An immunoaffinity column chromatography using anti-forskolin monoclonal antibodies appears to be far superior to previously published separations based on crystallization and chromatography. The capacity of the column is 9 μg/ml of gels.Forskolin has been isolated directly from the crude extractives of tuberous roots and the callus culture of *C. forskohlii*.