Primary screening for natural inhibitors against eukaryotic signal transduction from local medicinal plants in Sabah, Malaysia

Abstract

Studies on eukaryotic signal transduction pathways have led to a variety of potential molecular targets for cancer therapy including Mitogen-activated Protein Kinase Kinase 1 (MKK1), Glycogen Synthase Kinase 3β (GSK-3β) and Type 1 Protein Phosphatase (PP1). The protein kinases and phosphatases in the signal transduction pathways play a vital role in mitogen activated protein (MAP) kinase signal transduction, tumorigenesis, apoptosis, and cancer metastasis. In this study, genetically engineered yeast strains were used as a model in the search for potential inhibitors against these signalling elements. Eleven species of medicinal plants were selected from various locations in Sabah, Malaysia, extracted and tested against MKK, GSK-3β and PP1. Preliminary results showed the presence of potential MKK1 inhibitors in the crude extracts of Alphitonia excelsa, Cordyline terminalis and Tinospora crispa. However, no inhibitor was found against GSK-3β and PP1. The crude extracts of Cordyline terminalis was further fractionated using a bioassay guided fractionation and four partially pure active fractions were isolated.