Biotechnology-2013

OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on Biotechnology

September 23-25, 2013 Raleigh-North Carolina, USA

# The role of *meta*-topolins in micropropagation and secondary metabolite production of *medicinal plants*

**Stephen O. Amoo**

*University of KwaZulu-Natal Pietermaritzburg, South Africa*

## Abstract

Cytokinins (CKs) are a requisite group of plant growth regulators for controlling physiological processes during micropropagation. While benzyladenine (BA) has been widely used in plant tissue culture for many years, an increasing number of studies have evaluated the potential of *meta*-topolin (*m*T) as a viable alternative to BA in micropropagation. *meta*-Topolin (an aromatic cytokinin) is an hydroxylated analogue of BA with an hydroxyl group attached at its $N^6$ side chain which results in the formation of *O*-glucoside metabolites that can be reversibly sequestrated *in planta* to produce active cytokinin forms when needed. To further explore the potential of topolins, other derivatives of *m*T have been evaluated in optimizing micropropagation protocols. Results indicate that *m*T and its derivatives are superior to BA in improving shoot production and secondary metabolite production and/or reducing tissue culture-induced abnormalities in some medicinal plant species. Based on studies demonstrating the positive effects of tetrahydropyranyl (THP)-substituted CKs on rooting in micropropagated plants, we evaluated the beneficiary effects (if any) derivable from combining the favourable metabolic properties of *m*T with THP substitution at $N^9$ position in a single cytokinin. The effect of a new derivative, 6-(3-hydroxybenzylamino)-9-tetrahydropyran-2ylpurine [simply referred to as *meta*-topolin tetrahydropyran-2-yl (*m*TTHP)] on shoot production and rooting of two medicinal plants (*Aloe arborescens* and *Merwilla plumbea*) was investigated in comparison to the most active CKs previously reported for their micropropagation. Our findings indicate that the new derivative improved rooting without a significant reduction in shoot proliferation

## Biography

Dr Amoo holds a PhD degree in Botany from University of KwaZulu-Natal, South Africa and an MSc (Botany) from Obafemi Awolowo University, Nigeria. He is a Postdoctoral Research Fellow at the Research Centre for Plant Growth and Development, School of Life Sciences, University of KwaZulu-Natal, Pietermaritzburg. He is a recipient of Claude Leon Foundation, University of KwaZulu-Natal and South Africa National Research Foundation Postdoctoral Fellowships. He has many papers published in ISI-rated journals and has presented many papers at both national and international conferences.