

Letter to the Editor

Deactivation of Telomerase Enzyme and Telomere Destabilization by Natural Products: a Potential Target for Cancer Green Therapy

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Dear Editor

Telomeres are the structures that protect eukaryotic chromosomes in the cells. Telomeres are necessary components that stabilize the ends of eukaryotic chromosome and avoid the loss of genetic information (Parkinson, 2003). Meanwhile, telomerase is a reverse transcriptase that adds nucleotide repeats to telomeres by using RNA template providing karyotype stability and compensating for the loss of DNA that occurs with replication (Kim et al., 1994). In normal human somatic cells, which show little or no telomerase activity to synthesize new telomeres, the telomericDNAs progressively shorten with each cell division (Oulton et al., 2000; Odago and Gerson, 2003). On the contrary, most cancer cells have mechanisms that compensate for telomere shortening, most frequently through the activation of telomerase activity, permitting them to stably preserve their telomeres and let the cells grow indefinitely. In addition, telomerase enzyme is observed in more than 85% in the most cancer cells and is critical for cancer cell growth (Kazemi et al., 2013). These explanations propose that telomerase deactivation can operate as a cancer-suppressive mechanism.

Hence, deactivation of telomerase enzyme and telomere destabilization by natural products provide an opportunity to develop new target for cancer green therapy in the healing of human cancer, considering the importance of telomerase in tumor development (Shay and Wright, 2011). Currently, various synthetics compounds are used for chemotherapy of cancer. However, most have toxic adverse effects or consequences in the patient.

Therefore, it is important to expose the beneficial effects of green natural products such as medicinal plants with milder side effects on normal cells and potential anti-cancer effects (Badrzadeh et al., 2014). Moreover, natural products such as herbal remedies are generally a part of human diet or traditionally used as medications and have higher acceptability among the patients which were commonly considered edible and safe to consume (Nasiri et al., 2013). Furthermore, the natural products that inhibit the telomerase activity also can be intake as a functional food by the patients to cure, prevention or treatment of cancer. Accordingly, we put forward the usage of green herbal remedies from medicinal plants that deactivating the telomerase enzyme as phytomedicine in cancer prevention and this can be considered to be the direction

for future research that target for cancer green therapy.

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