The Tibetan herbal formulas Padma 28 and Padma Circosan inhibit the formation of advanced glycation end products and advanced oxidation protein products *in vitro*

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**Introduction**

Advanced glycation end products (AGE) and advanced oxidation protein products (AOPP) play a pivotal role in the development of diabetes associated diseases, such as atherosclerosis, diabetic neuropathy and nephropathy. The herbal medicines Padma 28 and Padma Circosan have shown effectiveness in symptoms of diabetes-associated diseases and have antioxidative effects. As yet it is not known whether inhibition of AGE and AOPP formation is a mechanism of action of those herbal preparations.

**Results**

Padma 28, Padma Circosan and the active control aminoguanidine reduced AGE levels by 58.6%, 56.7% and 58.14% (fluorometry, fig. 1) and by 35.48, 34.19 and 19.68% (ELISA, fig. 2) compared to the positive control (BSA and glucose), (all \( p<0.001 \)).

**Method**

Bovine serum albumin (BSA) was subjected to glycation or oxidation with or without 70% ethanolic extracts of Padma 28, Padma Circosan or with an active control (aminoguanidine or vitamin C, respectively). AGE and AOPP concentrations were analyzed fluorometrically and spectrophotometrically, respectively and by ELISA.

**Conclusion**

Both formulae significantly inhibited the formation of AGE and AOPP to a similar extent as the active controls. Since these are causative factors in the development of diabetes-associated diseases the results suggest a possible role for Padma 28 and Padma Circosan not only in circulatory disorders but also in the treatment and prevention of diabetes-associated diseases.