Partial purification and Bioavailability from Leguminous of biologically active lunasin, a chromatin-binding peptide

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The utilization of plant proteins has an attention due to the expanding demand for dietary protein. Legumes are the richest sources of proteins among plant foods. Lunasin is identical to a soybean peptide isolated and sequenced more than a decade ago. It is a unique 43-amino acid peptide that contains a poly-D carboxyl end with nine D residues, an RGD-cell adhesion motif and a predicted conserved helical region. Further more the interestingly, chemically synthesized lunasin peptide has an antimitotic effect to transformation cells by chemical carcinogens. To discovery of lunasin from other natural sources, we have attempted to screening from 21 kinds of leguminous such as *Albizzia julibrissin, Cercis chinensis, Cassia mimosoides* var. *nomame, Sophora flawescens, Lespedeza* × *cyrtobotrya, Kummerowia striata, Aeschynomene indica, Vicia amurensis, Vicia venosa* var. *cuspidata, Vicia venosissima, Vicia unijuga, Phaseolus angularis, Phaseolus nipponensis, Phaseolus angularis, Phaseolus radiatus, Glycine soja, Glycine max, Wistaria floribunda, Robinia pseudo-acacia, Amorpha fruticosa* and *Astragalus sinicus*). We have found a lunasin peptide from 3 kinds of leguminous such as *Lespedeza* × *cyrtobotrya, Kummerowia striata* and *Glycine soja* except *Glycine max*(soybean). And we report here the isolation, purification and biological assay of lunasin from legume(*Glycine soja*), a newly found rich source of the peptide. The identification of lunasin was established by Western blot analysis and mass spectrometric peptide mapping of the in-gel tryptic digest of the putative protein band. Enrichment of the fractions by ion exchange column chromatography with 0.7M NaCl phosphate buffer and immuno-affinity column chromatography before resolution on SDS-PAGE, Western blot and mass mapping analysis resulted in identification of lunasin 4.8 KDa proteins. The most fractions in extracts of soybean with ion-exchange column chromatography and immuno-affinity column chromatography were recovered for lunasin analysis, mass mapping and bioavailablity for colony assay and acetylation H3. Lunasin (0.1 mM) in extracts of soybean *Glycine soja* the number of colony formation and reduced H3 acetylation in cells treated with histone deacetylase inhibitor.