

Accepted Manuscript

Title: Insight into the functional and structural transition of garlic phytochemical induced by urea and guanidine hydrochloride: A comparative biophysical study

Authors: Mohd Faizan Siddiqui, Bilqees Bano



PII: S0141-8130(17)31497-6
DOI: <http://dx.doi.org/doi:10.1016/j.ijbiomac.2017.07.172>
Reference: BIOMAC 7980

To appear in: *International Journal of Biological Macromolecules*

Received date: 25-4-2017
Revised date: 20-7-2017
Accepted date: 29-7-2017

Please cite this article as: Mohd Faizan Siddiqui, Bilqees Bano, Insight into the functional and structural transition of garlic phytochemical induced by urea and guanidine hydrochloride: A comparative biophysical study, *International Journal of Biological Macromolecules* <http://dx.doi.org/10.1016/j.ijbiomac.2017.07.172>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Insight into the functional and structural transition of garlic phytocystatin induced by urea and guanidine hydrochloride: A comparative biophysical study

Mohd Faizan Siddiqui¹, Bilqees Bano*

¹Department of Biochemistry, Aligarh Muslim University, Uttar Pradesh, India

* Corresponding author email id: bano.bilqees12@gmail.com

Abstract

Cysteine proteinase inhibitors play an essential role in maintaining the proper functioning of all living cell by virtue of its thiol protease regulatory properties. Chemical denaturation of a new variant of cystatin super family has been studied by various biophysical techniques in order to characterize the unfolded and denatured state. Denaturation of garlic phytocystatin has been investigated using urea and guanidine hydrochloride (GdnHCl). Different biophysical techniques such as intrinsic fluorescence, circular dichroism and FTIR exhibited an altered structure of garlic phytocystatin with increasing concentration of denaturant. The inhibitory activity of GPC decreases with increasing concentration of denaturant. Increased fluorescence intensity along with red shift reflects the unfolding of GPC at higher concentration of denaturant. GdnHCl induced unfolding showed presence of indiscernible intermediate as followed by ANS binding studies. However, denaturation by urea did not show any intermediates. Mid-point transition was observed at 4.7 ± 0.1 M urea and 2.32 ± 0.1 M GdnHCl. Circular dichroism and FTIR results indicate the 50% loss of secondary structure at 5 M urea and 2.5 M GdnHCl. This study provides intriguing insight into the possible alteration of structure, stability and function of GPC induced by urea and GdnHCl.

Keywords: Cystatin; protein unfolding; circular dichroism

Download English Version:

<https://daneshyari.com/en/article/8328868>

Download Persian Version:

<https://daneshyari.com/article/8328868>

[Daneshyari.com](https://daneshyari.com)