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# Plant Metabolites: Methods, Applications and Prospects

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# Molecular Chaperones and Their Applications

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**Abstract**

Chaperone proteins play a vital role in maintaining cellular protein homeostasis. They assist in folding of newly synthesised nascent peptides and also in protecting proteins from denaturing when exposed to stress. Different classes of chaperone proteins and their functions are discussed with special reference to their importance in plant stress tolerance. Various applications of chaperone proteins in agriculture, medical and industrial fields are also explored.

**Keywords**

Chaperone proteins · Stress tolerance · Heat shock proteins · Biotech applications

## 21.1 Introduction

All organisms encounter a range of internal and external stresses on a daily basis. They have developed different coping mechanisms to protect against these stresses. The internal environment of biological systems exists in a state of dynamic equilibrium called homeostasis that is necessary for its normal functioning. Any external or internal factor that interferes with this equilibrium is termed a stressor, and stress can be defined as a condition in which homeostasis is under threat. Stresses include external factors such as, foreign toxins, oxidants, change in temperature, pH and

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