



## Review

## Ghrelin and cancer progression

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## ABSTRACT

Ghrelin is a small peptide with 28 amino acids, and has been characterized as the ligand of the growth hormone secretagogue receptor (GHSR). In addition to its original function in stimulating pituitary growth hormone release, ghrelin is multifunctional and plays a role in the regulation of energy balance, gastric acid release, appetite, insulin secretion, gastric motility and the turnover of gastric and intestinal mucosa. The discovery of ghrelin and GHSR expression beyond normal tissues suggests its role other than physiological function. Emerging evidences have revealed ghrelin's function in regulating several processes related to cancer progression, especially in metastasis and proliferation. We further show the relative *GHRL* and *GHSR* expression in pan-cancers from The Cancer Genome Atlas (TCGA), suggesting the potential pathological role of the axis in cancers. This review focuses on ghrelin's biological function in cancer progression, and reveals its clinical significance especially the impact on cancer patient outcome.

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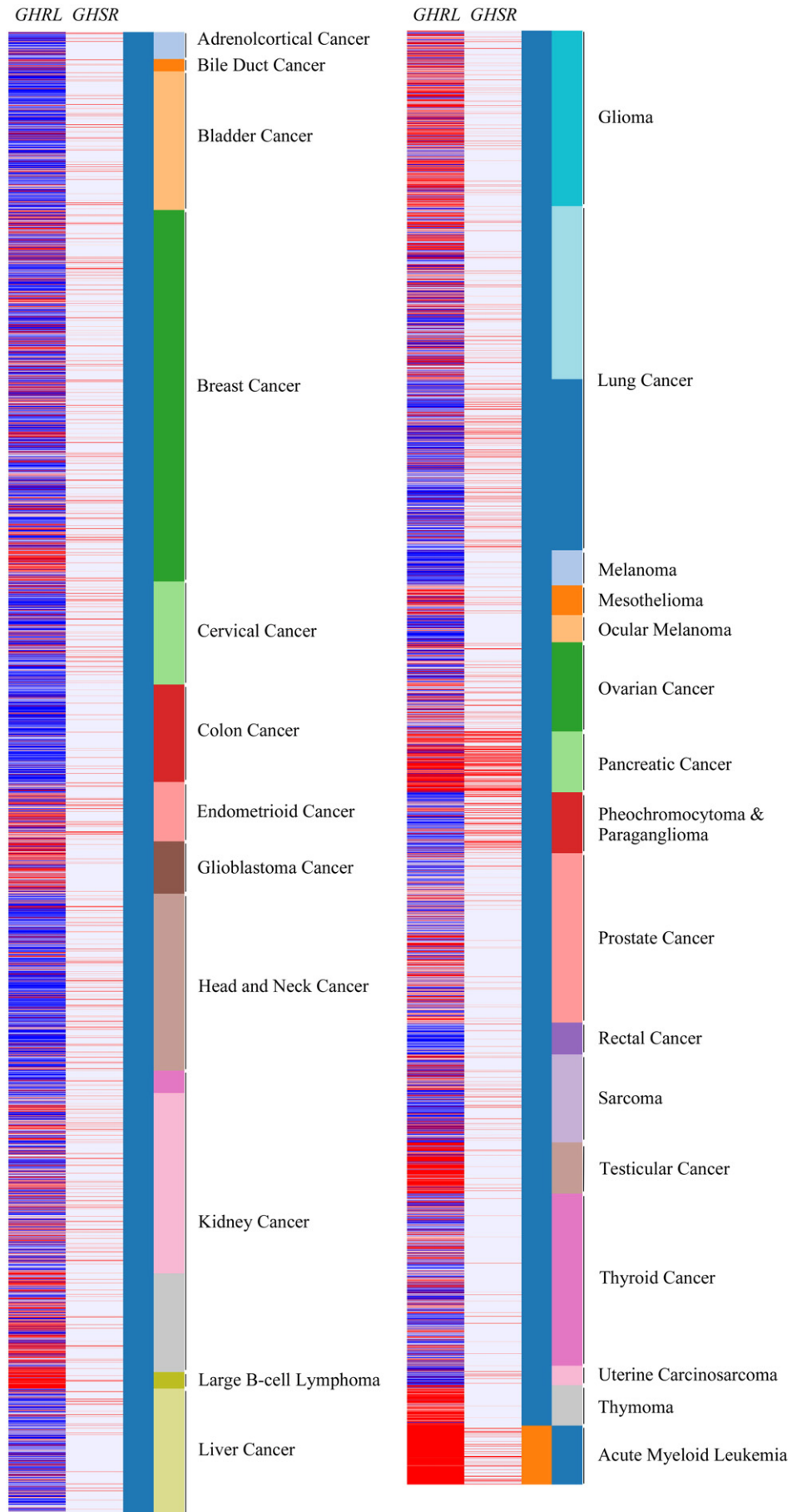
## 1. Introduction

The name of the peptide hormone ghrelin is derived from “ghre”, the Proto-Indo European root of the word “grow”. Ghrelin was originally isolated from the stomach mucosa and functions as the ligand of the growth hormone secretagogue receptor (GHSR) [1]. Ghrelin functions

to modulate hormone secretion, energy balance, gastric acid release, appetite, gastric motility, insulin secretion and the turnover of gastric and intestinal mucosa [1–7]. The discovery of ghrelin and GHSR expression beyond its traditional tissues suggests that it has a role outside of physiological function. Several critical factors are involved in cancer including proliferation, apoptosis, metastasis, angiogenesis and drug resistance. There is growing evidence indicating the function of ghrelin in regulating a number of processes related to cancer progression, although the precise role of ghrelin is still unclear due to systemic variance and experimental procedures. This review focuses on the function

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