

ORIGINAL ARTICLE

High expression of LC3A, LC3B, and p62/SQSTM1 autophagic proteins in human colonic ganglion cells

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Abstract

Introduction: Autophagy is a mechanism that degrades large damaged organelles and misfolded proteins to maintain the homeostasis in all cells. It plays double-faceted roles in tumourigenesis and prevention of various cancers. In our side observation of investigating the prognostic value of autophagy in colorectal cancer (CRC), we found high expression of autophagy proteins (LC3A, LC3B, and p62/SQSTM1) in the colonic ganglion cells. To our best understanding, this is the first paper reporting such finding. **Materials and Methods:** Formalin-fixed paraffin-embedded (FFPE) CRC tissues blocks were retrieved and confirmed by haematoxylin & eosin (H&E) staining. Immunohistochemistry (IHC) targeting autophagy proteins (LC3A, LC3B, and p62/SQSTM1) was then performed followed by pathological examination. **Results:** All three autophagy proteins were present in both normal and tumour tissues of CRC patients. Interestingly, high expression of autophagy proteins in colonic ganglion cells was consistently seen regardless of tissue type (normal or cancer) or tumour site (caecum, ascending, transverse, descending, sigmoid colon and rectum). **Conclusions:** This work highlights the high autophagic activities in human colonic ganglion cells.

Keywords: autophagy; colorectal cancer; colon; ganglion cells; LC3A; LC3B; p62/SQSTM1; immunohistochemistry

INTRODUCTION

Autophagy is a self-digesting defensive mechanism that degrades large damaged organelles and misfolded proteins to maintain the homeostasis in all cells and tissues.¹ Autophagy plays bi-faceted roles in both suppressing and promoting cancer growth.² Several decisive factors such as oxidative stress, lipid accumulation and genome instability could contribute to the autophagy-mediated tumour formation or inhibition.³ In CRC, accumulative evidences demonstrated that autophagy can serve as a therapeutic target⁴ and biomarkers for predicting treatment efficacies and prognostication.⁵

In our ongoing project, FFPE CRC tissues blocks were retrieved and IHC targeting the autophagy proteins (LC3A, LC3B, and p62/

SQSTM1) was performed. While the CRC tissues showed moderate to strong expression of respective autophagic proteins, consistently high expression of autophagy was also observed in the colonic ganglion cells. In order to search for more information to support or validate this finding, we performed a search on the PubMed library on National Centre for Biotechnology Information (NCBI) website using ‘ganglion cells’, ‘autophagy’ and ‘colorectal cancer’ as keywords. However, none of the reports from the search showed the finding in line with ours which makes our observation worth reporting.

Recent studies have highlighted the role of autophagy in retinal ganglion cells (RGC)⁶⁻⁸, but not in the colonic ganglion cells. Boya (2017) stressed the important roles of autophagy in axonal protection as well as reducing oxidative