Images in Cellular / Molecular Medicine

Long-term *Helicobacter pylori* colonization produces G cell hyperplasia and carcinoid tumor in Mongolian gerbils

Keywords: *Helicobacter pylori* • carcinoid • gastrin • immunohistochemistry

Establishment of persisting *H. pylori* infection in laboratory animals has been difficult, but a successful Mongolian gerbil model was reported by Hirayama *et al* [1]. Other studies showed that this model is useful for the study of *H. pylori*-induced chronic active gastritis and of the epithelial alterations that lead to intestinal metaplasia and gastric neoplasia [2].

Pyloric mucosa of a Mongolian gerbil, two years after the inoculation of *Helicobacter pylori* (*H. pylori*) Gastrin-positive G cells were increased in number in the pyloric gland.
(A) H&E staining, original magnification $\times 200$;
(B) Immunostaining for gastrin, original magnification $\times 200$.

References

1. Hirayama F., Takagi S., Iwao E., Yokoyama Y., Haga K., Hanada S., Development of poorly differentiated adenocarcinoma and carcinoid due to long-term *Helicobacter pylori* colonization in Mongolian gerbils, *J Gastroenterol*, **34**:450-4, 1999
2. Ikeno T., Ota H., Sugiyama A., Ishida K., Katsuyama T., Genta R.M., Kawasaki S., *Helicobacter pylori*-induced chronic active gastritis, intestinal metaplasia, and gastric ulcer in Mongolian gerbils, *Am J Pathol*, **154**:951-60, 1999

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Fundic mucosa of a Mongolian gerbil, two years after the inoculation of *H. pylori*

(A) Tumor cells show extensive involvement of the sub-mucosa H&E staining, original magnification $\times 20$.

(B) At higher magnification, the tumor is composed of uniform round cells with ill-defined cell outlines and monotonous-appearing round nuclei with finely strippled chromatin. The cytoplasm is coarsely granular and eosinophilic. Tumor cells grow in nests or tubules. H&E staining, original magnification $\times 200$.

Fundic mucosa of a Mongolian gerbil, two years after the inoculation of *H. pylori*

Tumor cells are strongly positive for neuroendocrine marker, chromogranin A, by immunoperoxidase method. Immunostaining for chromogranin A

(A) original magnification $\times 20$;

(B) original magnification $\times 200$.

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