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Common expression of the tumor marker D-galactose-beta-[1-->3]-N-acetyl-D-galactosamine by different adenocarcinomas: evidence of field effect phenomenon.

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Abstract

The simple carbohydrate tumor marker D-galactose-beta-[1-->3]-N-acetyl-D-galactosamine (Gal-GalNAc) can be easily identified by a sequential galactose oxidase (GO)-Schiff reaction either on tissues or on rectal mucus samples from patients with colorectal cancer. To check the usefulness of this marker and technology in identifying cancers and precancers of other organs, we have assessed the differential expression of Gal-GalNAc in various adenocarcinomas and their corresponding normal tissues. The expression of Gal-GalNAc determined by GO-Schiff sequence was examined in a total of 133 tissue samples from 81 cases of the adenocarcinomas of the breast, ovary, pancreas, stomach, and endometrium and 52 cases of respective normal controls. None of the 52 cases of normal tissues (except 15 cases of stomach) showed expression of Gal-GalNAc. In contrast, 100% of adenocarcinomas from the breast (19 of 19), ovary (15 of 15), and pancreas (6 of 6), 94.1% of stomach (16 of 17) cancers, and **91.7% (11 of 12) of uterine adenocarcinomas expressed Gal-GalNAc.** The expression of Gal-GalNAc in cancerous tissues was mostly strong and widespread and was distributed in both secreted mucin and cytoplasmic mucin droplets. The normal epithelia and their secretions in the vicinity of the carcinoma (within the "field") in the breast, bronchus, endometrium, and pancreatic duct also expressed Gal-GalNAc **in contrast to normal tissues obtained from noncancerous individuals, which were totally nonreactive.** It is concluded that the tumor marker Gal-GalNAc recognized by GO-Schiff sequence was highly expressed not only by a variety of adenocarcinomas but also by the app! arently normal-appearing epithelia and their secretions in the vicinity of carcinomas, strongly suggesting a field effect phenomenon of carcinogenic agent(s). Identification of the marker in these secretions may have great potential in our strategies for mass screening for those cancers.