

THE DYNAMIC OF TFF₁ AND TFF₃ PEPTIDE PRESENCE IN MOUSE EMBRYONIC GASTROINTESTINAL SYSTEM FROM DAY 14 TO 18 OF INTRAUTERINE DEVELOPMENT



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Introduction

Trefoil factor family (Tff) peptides are important for protection and restitution of gastrointestinal (GI) mucosa. They are found in a large part of the GI tract, from the oral cavity to the rectum, as well as in some glands associated with the GI tract. Endodermal to gastrointestinal epithelium differentiation in mice occurs during 15th or 16th day of intrauterine development. Tff peptides have been researched in this context to an extent, but no systemic immunohistochemical studies have been performed in order to describe the presence of these peptides depending on the developmental stage. The aim of this research was to describe the presence of Tff1 and Tff3 peptide in the GI mucosa from day 14 to 18 of mouse intrauterine development.

Materials & Methods

4% paraformaldehyde fixed and paraffin-embedded CD1 mouse embryos (n=23) at gestational days 14 to 18 were used. Sagittal sections 6µm thick were cut and transferred to adhesive slides. The embryos were stained with purified proprietary, self-made anti-Tff1 and anti-Tff3 rabbit primary polyclonal antibodies. Labeled Streptavidin Biotin (LSAB) method was used, with PBS as a negative control. Mayer's hematoxylin was used for counterstaining. Immunohistochemical (IHC) signal intensity was semi-quantified as: 0 – no signal, 1 – weak to mild signal, 2 – moderate to strong signal.

Results

The localization of Tff1 and Tff3 peptide was similar to, but somewhat different from that of adult mice, with specific localization patterns for both peptides. Both peptides were found in oral cavity, stomach, small intestine, colon, liver and pancreas. Their localization and distribution depended on the developmental stage with strengthening of the signal until day 18 in most cases, but with a few exceptions (e.g. TFF1 presence in the large intestine and TFF3 presence in pancreas).

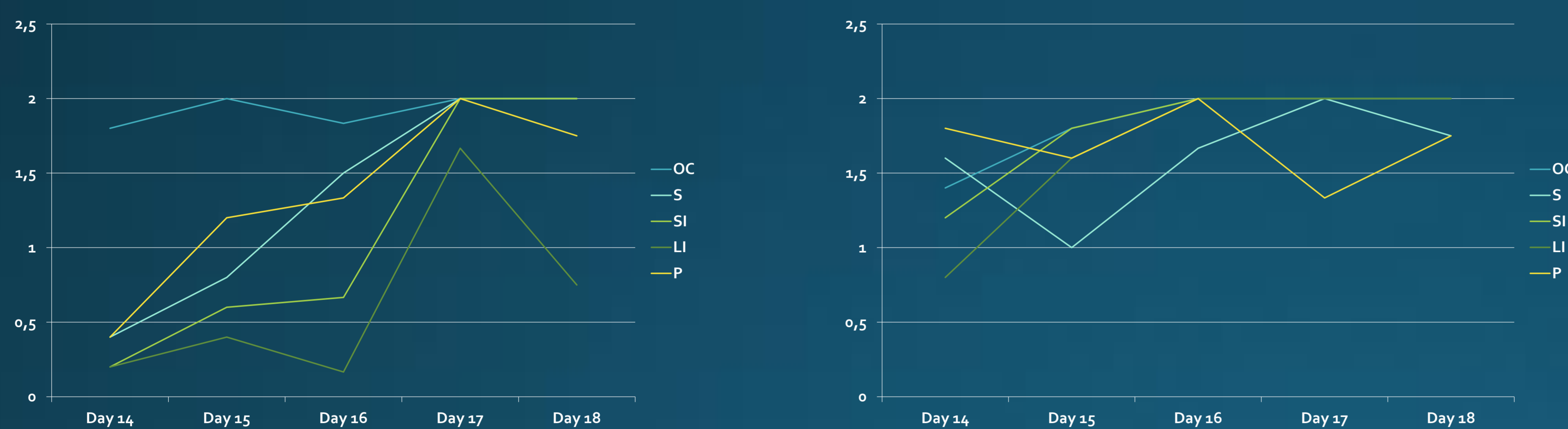


Fig. 1. Graphic display of TFF₁ peptide (left) and TFF₃ peptide (right) relative signal intensity in different parts of digestive system. The majority of tissues showed a stable increase in TFF peptide IHC signal with age (although TFF₁ signal in colon began weakening on day 18, and TFF₁ in oral cavity and TFF₃ in pancreas had more or less stable signal strength. OC = oral cavity; S = stomach; SI = small intestine; LI = large intestine; P = pancreas. 0 = no signal; 1 = weak/mild signal; 2 = moderate/strong signal.

Conclusions

Tff1 and Tff3 peptides can be viewed as markers of the GI mucosa maturation during embryonic development. They also might have an influence on the differentiation of endoderm into mature epithelium. Further research might confirm or deny that, as well as show the extent of their influence on embryonic development of GI system.

References

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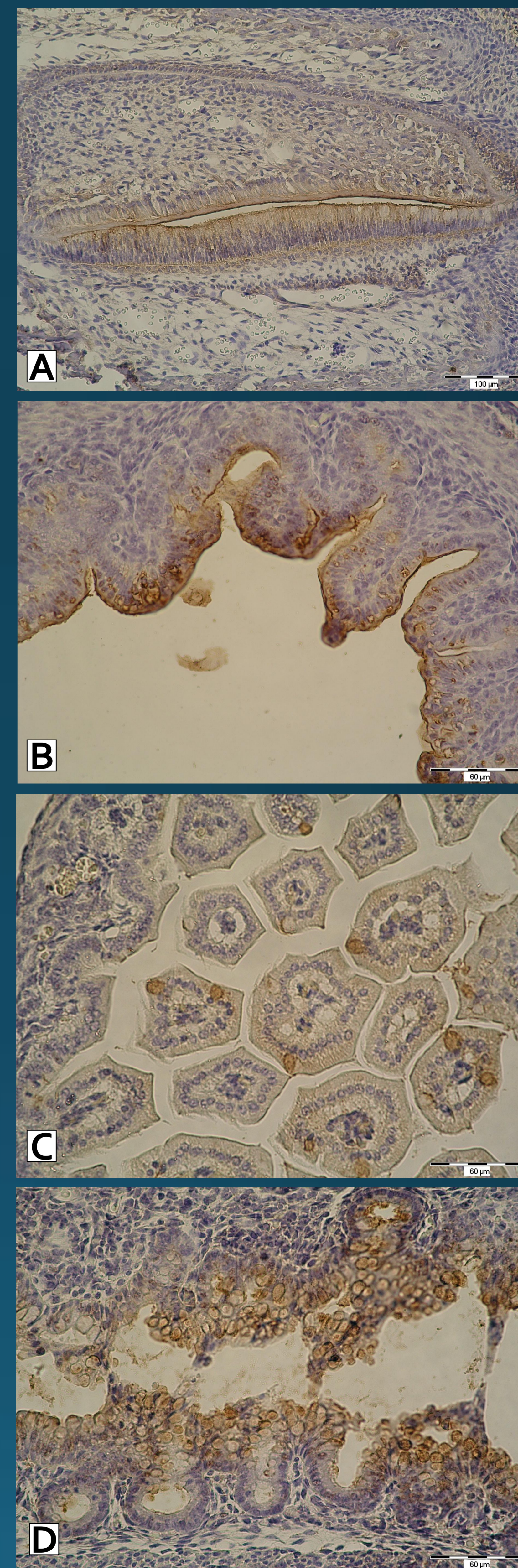


Fig. 2. A) TFF₁ peptide, developing tooth, 18 day-old embryo. B) TFF₁ peptide signal, glandular stomach, 18 day-old embryo. C) TFF₃ peptide, small intestine, 17 day-old embryo. D) TFF₃ peptide, large intestine, 18 day-old embryo. Scale bar: A: 100 µm B-D: 60µm.

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