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PRAP1: A Novel Epithelial Secreted Protein

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Proline rich acidic protein-1 (PRAP1) is a 17 kDa secreted intrinsically disordered protein encoded in higher chordates with no known function or recognizable sequence homology. In the course of evaluating transcriptional activation in murine gut by members of the Lactobacilli taxon, we found PRAP1 induced in the colon within 4 hours of oral gavage with 10^8 Lactobacilli. To define the physiological role of PRAP1, we have made polyclonal antibodies, PRAP1 recombinant protein and *Prap1* null mice. Measurement of PRAP1 expression by qPCR and western blot reveal PRAP1 expression is highest in the proximal small intestine, and interestingly, in a hormonally dependent manner in uterine endometrial cells of female mice. This expression pattern is consistent with immunofluorescence staining demonstrating high expression of PRAP1 in the enterocytes of the duodenum, goblet cells of the ileum and uterine endometria, as well as in the extracellular space of the corresponding mucosal tissue. Preliminary *in vivo* data shows *Prap1* null mice have increased inflammation in the gastrointestinal tract and uterus, along with increased systemic inflammation. Given the localization of PRAP1, its secretion into the lumen of the small intestine and uterus, and its effect on local and systemic inflammation, we hypothesize that PRAP1 is a novel intrinsically disordered protein that contributes to the intrinsic defenses of mucosal epithelial surfaces.

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