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Cloning of the Human Lactoferrin Gene and Germline Transformation of the Silkworm *Bombyx mori* L. with *a piggyBac* Vector

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Lactoferrin, an ion-binding 80-kDa glycoprotein, has been suggested to have many biologic activities, such as facilitating ion absorption and having antimicrobial and antiinflammatory effects. Several of these activities are likely to only be facilitated by human lactoferrin because they depend on the binding of human lactoferrin to specific receptor. To produce recombinant human lactoferrin to animal foods using transgenic silkworm, *Bombyx mori*, we have cloned and sequenced the cDNA encoding for a human lactoferrin(hLf) from the mRNA in mammary tumor line(GI-101). As a result, the 2.5-kb fragment of hLf gene was cloned with pGEM-T vector and than this fragment was sequenced. In the nucleotide sequence analysis, single open reading frame of the 2,136-bp encoding for a polypeptide of 712 amino acid residues was detected. On the other hand, we constructed a recombinant plasmid(pPT-hLf), containing human lactoferrin for germline transformation of the silkworm *B. mori* L. using a *piggyBac* transposon-derived vector. A nonautonomous helper plasmid encodes the *piggyBac* transposase. Approximately 3.6% of individuals in the F0 silkworms expressed GFP. PCR and Southern blot analyses of GFP-positive F0 silkworms revealed that independent insertions occurred frequently. On the basis of these experiments, expression of hLf in G1 generation of transgenic silkworm is now in process.