Antigen presenting cells are capable to capture the DNA immediately after in vivo administration (a) and express the antigens encoded within the vaccine (b). Once expressed, antigens can be secreted to the milieu (c), where they can be recognised by the specific B cells in circulation, responsible for the final secretion of the specific antibodies. Additionally, a small proportion of the protein could be recognised by the ubiquitin conjugating system that leads to rapid degradation of the protein within the proteasome (d). The small peptides generated are then susceptible to be transported to the ER where they can bind to the specific SLAI molecule and finally, the peptide-SLAI complexes can be transported to the cell surface (e) where they can recognised by the specific CD8+ T-cells.
Figure 2. Schematic representation explaining the rationale behind vaccine strategy.

Fusion of ubiquitin to the vaccine antigen promotes that each newly synthesised antigen molecule (and not only a small proportion of it) was rapidly marked for efficient hydrolysis within the proteasome (d). The degradation can be so effective that no antigen is secreted to the milieu (no-c), thus avoiding the interaction with the B cells and the induction of specific antibodies. In contrast, the SLAI-restricted presentation of the antigen is dramatically improved (e) and the induction of specific CD8+ T-cells exponentially enhanced.