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Alternative mRNA translation events for antigenic peptides and for full length proteins

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The presentation of antigenic peptides (AP) on MHC class I molecules allows the immune system to detect and eliminate cells that are infected by pathogens or are transformed. Until more recently little attention was given to the source AP and it was widely assumed that these were derived from the degradation of full length proteins. But based on observations showing a poor correlation between antigenic peptides and protein turnover rate challenged this concept[1]. More recently we made the observation that mRNAs targeted for the nonsense-mediated degradation pathway which prevents faulty mRNAs from translating full length proteins still produced the same amount of AP substrates[2]. We could also show that mRNAs stop producing AP substrates long before they stop to encode the full length proteins. Most surprisingly was the observation that APs are equally well presented when inserted into introns[3]. Our observations suggest that AP and full length proteins are produced during two spatiotemporally different events and several different data indicate that the former might take place in the nuclear compartment.

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