Abstract. Let $X$ be a set of size $v$ and $0 \leq t \leq k \leq v$. The set of all signed list designs with block size $k$ is a module $M(L_k(X))$ over $\mathbb{Z}$ and $\partial_t$ defines a natural homomorphism from $M(L_k(X))$ to $M(L_t(X))$. The kernel of this homomorphism is the module of all null $t$-list designs. The set of all lists of size $k$ is totally ordered under the lexicographic ordering. A tag is the largest element under the lexicographic ordering in the support of a null $t$-list design. Tags provide a natural basis for the image module under the map $\partial_t$.

A tag was first defined by the first author for the sets a few years ago. It provided a tool to study problems like existence conjecture of $t$-designs or the problem of characterization of degree sequences of $k$-uniform hypergraphs. These concepts were recently extended to lists in a joint work of the authors. These results and their applications to the existence of Steiner systems will be discussed in the lecture.

Keywords. Steiner systems, lists, tags, designs