

Regular Wednesday IMG seminar



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“Harnessing TCR discoveries for the next generation of immunotherapies”

Recent advances in synthetic immunology and CAR T cell engineering have highlighted the critical importance of signaling diversity for optimizing anti-tumor responses. Our work outlines the design of innovative cell-based cancer immunotherapies rooted in a molecular understanding of T cell activation via the T cell receptor complex (TCR-CD3). I will discuss how modulating receptor signaling interfaces and precisely recruiting kinases and adaptors can advance both fundamental immunology and translational therapies. Key noncanonical interactions between specific components of the TCR-CD3 complex and the Src-kinase Lck fine-tune T cell activation; when implemented in chimeric antigen receptors (CARs), these mechanisms improved *in vivo* tumor control and reduced T cell exhaustion. Supporting our rational design of next-generation CAR T cells, we demonstrated that harnessing CD3 chain diversity, rather than simply increasing signaling strength, enabled the generation of CAR T cells with enhanced anti-tumor efficacy and safety profiles.

**The seminar will be held
on Wednesday 4 February 2026 at 15:00
in the Milan Hašek Auditorium at IMG**

(Institute of Molecular Genetics of the Czech Academy of Sciences, Vídeňská 1083, Prague 4)
