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# 8TH EUROPEAN IMMUNOLOGY CONFERENCE

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## Single domain antibodies for the knockdown of cytosolic and nuclear proteins

Single domain antibodies (sdAbs) from camels or sharks comprise only the variable heavy chain domain. Human single domain antibodies comprise the variable domain of the heavy chain or light chain. SdAbs are stable, non-aggregating molecules *in vitro* and *in vivo* compared to complete antibodies and scFv fragments. They are excellent novel inhibitors of cytosolic/nuclear proteins, because they are correctly folded inside the cytosol in contrast to scFv fragments. SdAbs are unique because of their excellent specificity and possibility to target posttranslational modifications such as phosphorylation sites, conformers or interaction regions of proteins that cannot be targeted with genetic knockout techniques and are impossible to knockdown with RNAi. The most frequently selected antigenic epitopes belong to viral and oncogenic proteins, followed by toxins, proteins of the nervous system as well as plant-and drosophila proteins. It is now possible to select functional sdAbs against virtually every cytosolic/nuclear protein and desired epitope using synthetic single pot single domain antibody libraries without the need of immunization. In summary, cytosolic/nuclear sdAbs of camelid, shark and human origin can be applied to clarify the function of uncharacterized proteins such as virus proteins and host cell factors, oncogenic proteins and cofactors, proteins of the nervous system, intracellular enzymes involved in signaling, transcription factors and proteins involved in differentiation and development.

### Biography

Thomas Böldicke has obtained his PhD degree from Max Planck Institute of Molecular Genetics, Berlin. Since 1986, he has been working at Helmholtz Centre for Infection Research, as a Project Leader of Intracellular Antibodies.

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