

## **Strengths and weaknesses of non-animal derived therapeutic antibodies**

Therapeutic antibodies can be generated either from *in vivo* or *in vitro* technologies. *In vivo* approach typically involves immunization of animals and subsequent capture of their antigen-specific immune repertoire by hybridoma or single B cell technologies. In contrast, *in vitro* technologies rely on screening of phages libraries that display antibody-fragments like Fab and scFv.

According to the source of library sequences, there are three main types of phage display antibody libraries: immune (i.e. derived from immunized animal or patients), naïve (e.g. naturally rearranged human variable region genes) or synthetic (computational *in silico* design and gene synthesis). While both *in vivo* and *in vitro* approaches are well suited to identify therapeutic antibodies, each method presents some advantages and challenges, which will be discussed based on data generated in Sanofi's antibody discovery laboratories.