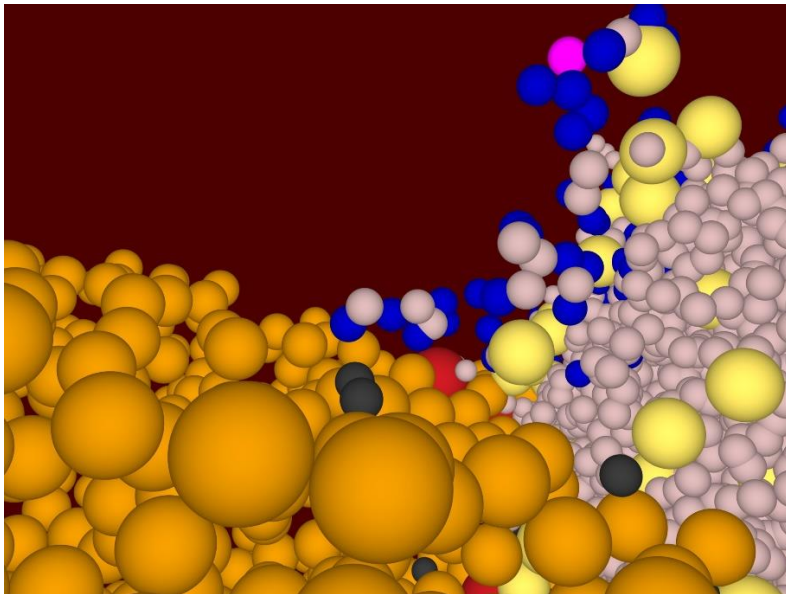


Improving antibody responses to infections with computer simulations Prof. Dr. Michael Meyer-Hermann, Helmholtz Centre for Infection Research, Braunschweig



A successful fight of infections and protection against future infections relies on successful generation of protecting antibodies that bind to the pathogen and of memory cells able to quickly produce those antibodies upon re-encounter of the pathogen. These antibodies are developed in germinal centers, particular sites of the immune system, which give rise to optimized antibodies. For that purpose within a living organism specialized cells, B lymphocytes, actively mutate their genes to develop a diversity of encoded antibodies and subsequently undergo selection for fitness of the antibodies to fight the infection. With computer simulations, this evolutionary process will be explained and analyzed to determine new ways of how to improve the natural development of high affinity and highly diverse antibodies. Implications for the development of broadly neutralizing antibodies in the context of natural infections and vaccination will be drawn.