Istituto di Ricerca in Biomedicina
Institute for Research in Biomedicine

NEWS

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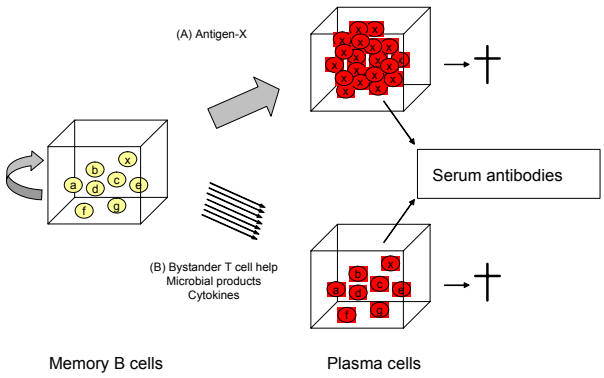
How can serum antibodies be maintained for a lifetime?

It is well established that low levels of protective antibodies can be maintained in humans for a lifetime following infection with viruses such as measles virus or following appropriate boosting with protein antigens such as tetanus toxoid. An important, still open question, is how these antibody levels can be maintained for a lifetime. Two models have been proposed. A first is that antibody production is sustained by long lived plasma cells that represent small cell factories that secrete antibodies at tight rate. A second model is that specific memory B cells proliferate and differentiate to short lived plasma cells in response to persisting antigens. Both models however do not explain the extraordinary persistence of antibody levels since plasma cells do not survive indefinitely and since not all antigens persist in our body. In a recent study, published in the 13 December 2002 issue of Science, IRB researchers have proposed an alternative model namely that antibody memory is maintained by continuous activation of all memory B cells in the absence of the specific antigen. According to the new model memory B cells function in two distinct modes as "memory stem cells" (see figure). On the one hand, after antigenic stimulation, specific memory B cells rapidly proliferate and generate a large number of specific plasma cells and antibodies. On the other hand, in the absence of antigen, all memory B cells proliferate at low rate and irrespective of their antigenic specificity produce plasma cells that maintain constant antibody levels. *Bernasconi N., Traggiai E., Lanzavecchia A. 2002. Maintenance of serological memory by polyclonal activation of human memory B cells. Science 298:2199-2202.*



Biopolo Ticino opened his office at the IRB

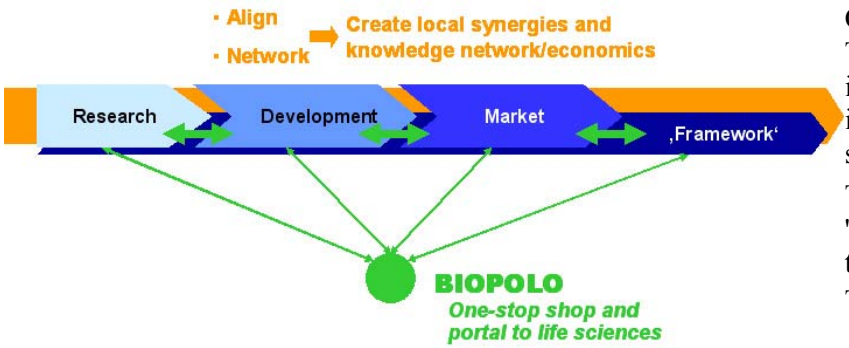
The goal of the Biopolo Ticino is to catalyze and sustain the integration process of the life science sector in Ticino (knowledge network). Its activities will focus on promoting the integrated Ticino life science competencies outside the canton, and to promote/coach/attract interesting and interested entities to Ticino ('one-stop shop' and 'portal' for life sciences).

Life science industry - fast growing worldwide

Based on various megatrends (aging population, innovation, etc.) the pharma/biotech (general life science) industry is to grow strongly in the next decades, nonetheless biotech is expected to even outpace pharma growth. Therefore, if a region wants to remain competitive and grow in the global marketplace, a special focus is required to promote the biotech industry .

Life science including biotech in Ticino: rich but fragmented and poorly networked

The life science sector in Ticino is important: It encompasses 125 companies, which are active in various fields, generates more than 6% of the GDP and employs 1'800 people. In addition, there are several research institutes and clinics, some of which are internationally renowned. However, the life science sector in Ticino is fragmented and poorly networked across and within the different interest groups. This is certainly partly due to the fact that there is neither a scientific university nor a technology transfer center for biotechnologies.



One of the main goals of the Biopolo Ticino is to align, network and integrate the life science value chain in Ticino highlighted in the following scheme.

The Biopolo Ticino will work as a 'portal' and as a 'one-stop shop' for the life sciences in, from and to Ticino.