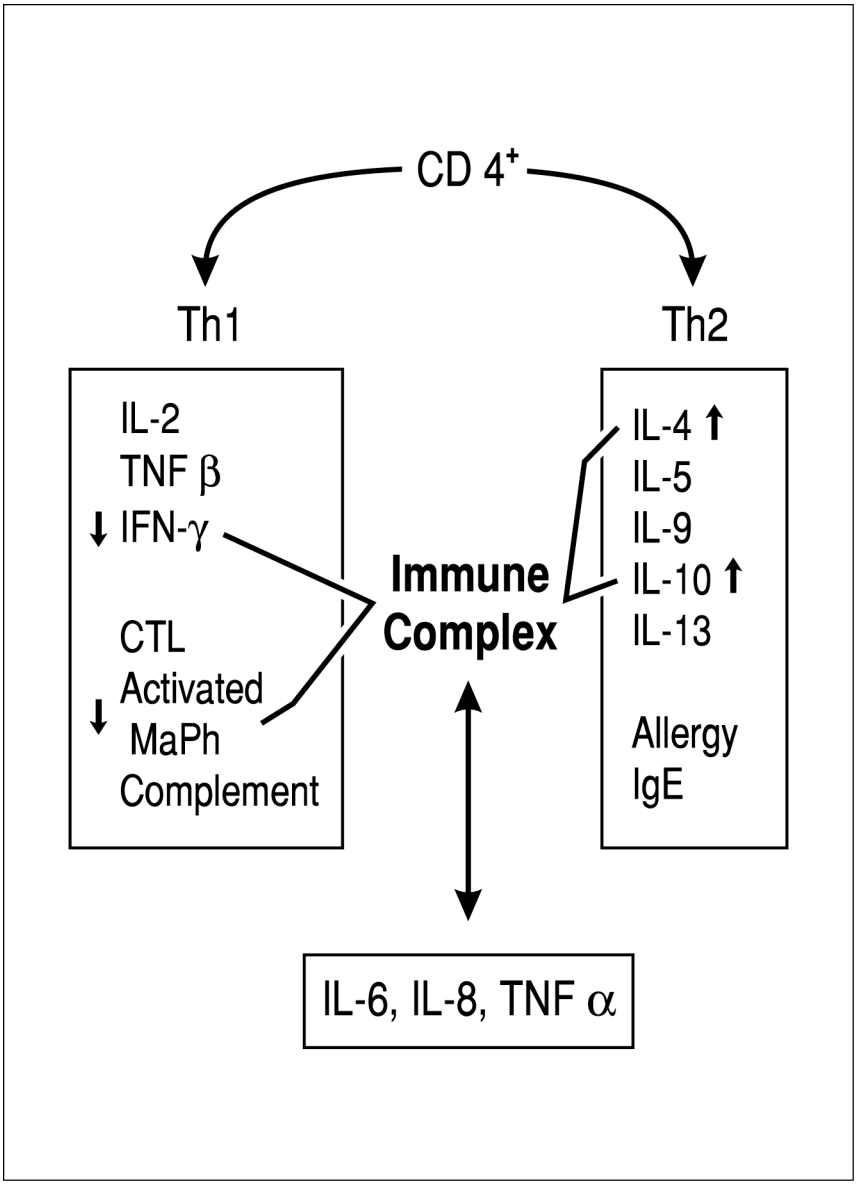
Cytokine Network

Circulaitng leukocytes are integral components of the immune system. Peripheral B- and T-lymphocytes, NK (natural killer)-cells, monocytes and neutrophil polymorphonuclear leukocytes send signals out that might engage each other. Stem- and later stage cell-differentiation stages get further differentiated and maturity ensues at given differentiation level. Part of information not only proceeds through cytokine signaling but also via adhesion proteins, i.e. selectins. Detailed knowledge on such processes have been obtained using purified/enriched cell populations in vitro and cannot serve as pure models for what happens in the complicated in vivo situation of laboratory animals or humans. Cytokines breach bridges between inflammation and immunity and represent a homoestatic system, with pro-&antiiflammatory as well as immuno-stimulating and immunosuppressing potential. A whole array of different cell receptors waits for instruction which signal to transduce before firing a given cell type. In fact, the activity of immune complexes also depends on the cytokine network: cellular Fc receptor phenotypes (backed up by an extremely complex genetic background) control degranulation, phagocytosis, antibody-dependent cellular cytotoxicity (ADCC), transcription of cytokin-genes and put to sea of inflammatory mediators. Immune complexes like FcR II types (CD32) activation of which inhibit cytokin release by inhibiting calcium influx into the cell. Immune complexes reduce helper T cell dependent cytokine interferon and produce a rise of serum concentrations of the TH2-dependent IL-4 and IL-10. This latter cytokine might inhibit immune complex deposition in lungs.



The world of cytokines is extremely complex but some ordered constellations are identifiable. Some cytokines like tumor necrosis factor TNF and interleukin- 6, IL-6, in fact have been identified to be important in children heart surgery where the surgical manoeuver exerts I_-6 increase and inflammatory syndrome that inhibits wound healing and might induced atrial fibrillation. Animal experiments with knock-out mice see some cytokines more important than others to influence the activity of immune complexes. CTL: cytotoxic T lymphocyte, IFN: interferon