ImmunoTools *multiplex* Award 2014

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Profiling of immune markers in models of cellular plasticity

Cellular plasticity changes occur during different pathological processes (e.g. wound healing). In general this plasticity is closely related to epithelial-mesenchymal transition. This is a spatio-temporal process that plays an important role in a variety of developmental processes like gastrulation or migration of neural-crest cells from the neural tube. During adulthood epithelial plasticity is more restricted though very important in e.g. tissue reorganization during wound healing. In these tightly regulated processes, loss of cell junctions and detachment from the fixed ECM adherence is induced, coinciding with *de novo* expression of mesenchymal markers such as vimentin and further induction of motility. Very often epithelial plasticity has been associated with the downregulation of E-cadherin expression. E-cadherin has an important function during embryogenesis and morphogenesis of adult tissues, as it is necessary in the formation of cell polarity during epithelial cell differentiation. Transcriptional repressors like Snail, Slug, E47 and Twist are able to repress E-cadherin and other epithelial adhesion genes via binding on E-boxes present in the proximal promoter. Over the past 10 years, evidence has been accumulating that these nuclear factors are key regulators of epithelial plasticity (*De Craene & Berx, Nat Rev. Cancer, 2013 – 2013 Feb;13(2):97-110*).

Over the last decade we have been building different conditional models (in vitro and in vivo) to monitor these plasticity changes. In our running research projects we are studying expression modulation of EMT related transcription factors in (epithelial) stem cells and their consequence for the immune compartment. Therefore we have developed a qPCR based screen for more than 250 different immunological markers.

The markers can be screened with our in house liquid handling platform allowing the automated filling of 384-well plates. Our screening tools allow us to date to study immunological and inflammatory responses in our mouse model systems, and should offer opportunities to actively collaborate with several departmental research groups with interest in immunity. On the other hand we would like to extend our experimental approach to our human model systems. In that sense the multiplex approach offers us a complementary methodology to validate in a fast way our observations made in mouse models, and as such check the relevance of our findings in a human setting.

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includes free analysis of samples on several antibody arrays with large range of antibodies against human CDs, human cytokines, and others ...