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## **Beyond the bone marrow - defining peripheral B cell differentiation**

### Abstract:

B cells go through many steps as they differentiate from early precursors in the bone marrow to antibody-producing plasma cells. Several differentiation stages can be defined; both in the bone marrow, and after the B cells leave into peripheral tissues. The relationship between these different stages, and the signals that select B cells for further differentiation are, however, incompletely understood. This lecture will focus on peripheral B cell differentiation during systemic and mucosal responses in humans and mice. I will describe a new cell surface marker that can be used to define human memory cells and a previously unacknowledged type of immature B cells. The expression of this marker is not dependent on differential transcription or splicing during differentiation, but rather a mechanism of regulated changes of glycosylation. I will also discuss a novel study from our group with regard to systemic B cell memory, with focus on defining how an adjuvant can trigger life-long systemic immunity after a single immunization in mice. Finally, I will discuss T dependent and independent IgA plasma cell differentiation in the gut of mice. This part focuses on two mice models that we are using in the lab, T and germinal centre independent IgA differentiation in CD40<sup>-/-</sup> mice and antigen-specific, T-dependent response to the hapten NP when it is conjugated to cholera toxin.

### Short Biography:

1994-1998: PhD studies at Lund University in Tomas Leandersons group. Thesis title "The functional anatomy of  $\kappa$  promoters"

1998-2001: Postdoc at the MRC-Laboratory of Molecular Biology, Cambridge, UK in Michael Neuberger's group

2001-2010 : Researcher at Gothenburg University. From 2006 part of MIVAC (the Mucosal Immunobiology and Vaccine Center).

### Selected publications:

Bergqvist P., Stensson A., Lycke N.Y. and Bemark M. (2010) T cell-independent IgA class switch recombination is restricted to the GALT and occurs prior to manifest germinal center formation. **J. Immunol.** 184: 3545-3553.

Bergqvist P., Gärdby E., Stensson A., Bemark M.¶ and Lycke N.Y.¶ (2006) Gut IgA class switch recombination in the absence of CD40 does not occur in the lamina propria and is independent of germinal centers. **J. Immunol.** 177:7772-7783.

Zander L and Bemark M (2004) Immortalized mouse cell lines with an inactivated Rev3 gene are hypersensitive to UV irradiation and cisplatin treatment **DNA repair.** 3:743-752.

VIII. Bemark, M., Sale J.E., Kim H.-J., Berek C., Cosgrove, R. and Neuberger M.S. (2000) Somatic hypermutation in the absence of DNA-PKcs or RAG1 activity. **J. Exp. Med.** 192:1509-1514]