



Enhanced efficacy of RA treatment with a novel genotyping predictor test for IgG receptors

- This technology can forecast treatment efficacy of patients prior to treatment with IgG's.
- This technology prevents ineffective and unnecessary use of IgG's, limiting costs of these expensive therapeutic antibodies and thereby increasing acceptance by payers/health insurance companies.

Diagnostic | Monoclonal Antibodies

2011

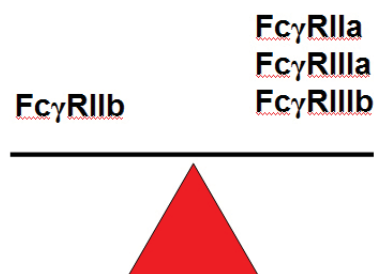
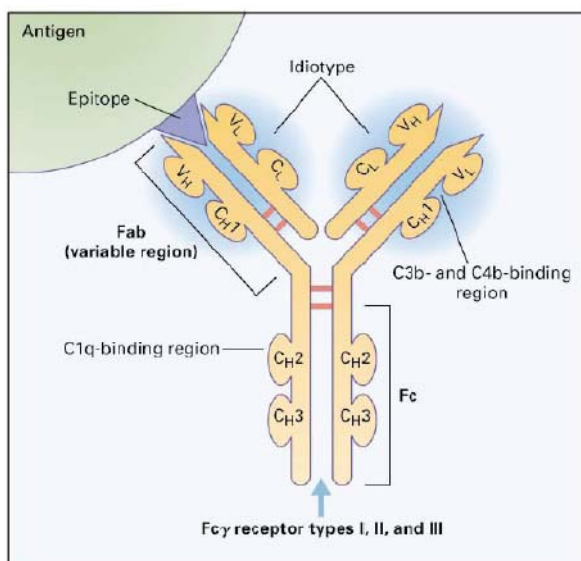
Background

IgG-based therapeutic monoclonal antibodies target either soluble mediators or cellular surface proteins and are used to treat a broad range of diseases including cancer, inflammatory & autoimmune diseases. Although successful in many cases, a substantial number of patients 'under perform' with the current use of biologicals as adjuvant therapy. For their efficacy, the therapeutic antibodies greatly depend on binding to IgG receptors (FcγRs).

The Technology

Researchers at Sanquin have recently discovered a method to predict the phenotypic response of patients to IgG treatment by examining the copy number variation (CNV) of key Fcγ receptor genes.

The balance between activating and inhibitory IgG receptors dictate effector functions of IgG to a large extent. By comparing the CNV of FcγRIIb with FcγRIIa, FcγRIIIa and FcγRIIIb through an MLPA assay, we are able to accurately predict clinical efficacy of depleting antibodies, in which ADCC is considered the mainstay mechanism of killing. This allows for personalised IgG treatment on a patient to patient basis, effectively minimising the costs of treatment while maximising the effects and thereby increasing the acceptance by payers/health insurance companies.



The balance between copy number variations of different Fcγ receptors largely determines the efficacy of therapeutic antibodies.

Intellectual Property

Patent nr. WO2007073179.
Publication date 2007-06-28
[Direct link](#).

Inventors

Department of Experimental Immunohematology,
Sanquin Research:
- Prof TW Kuijpers MD PhD (also Professor in Pediatric Immunology, AMC)
- Prof D Roos PhD

Key publications

1. Breunis WB, van Mirre E, Bruin M, Geissler J, de Boer M, Peters M, Roos D, de Haas M., Koene HR, Kuijpers TW. Copy number variation of the activating FCGR2C gene predisposes to idiopathic thrombocytopenic purpura. *Blood*. 2008; 111(3): 1029-1038.
2. Breunis WB, van Mirre E, Geissler J, Laddach N, Wolbink GJ, van der Schoot E, de Haas M, de Boer M, Roos D, Kuijpers TW. Copy number variation at the FCGR locus includes FCGR3A, FCGR2C and FCGR3B but not FCGR2A and FCGR2B. *Hum Mutat* 2009; 30(5): E640-50.
3. Breunis WB, van der Heijden J, Geissler J, de Boer M, Laddach N, Tanck MWT, Burgner D, Roos D, the International Kawasaki Disease Genetics Consortium, Kuijpers TW. Genetic variation of the Fc gamma receptors in Kawasaki Disease revisited. *Genes Immun*. 2010, in press.
4. Van der Heijden J, Breunis WB, Geissler J, de Boer M, van den Berg TK, Kuijpers TW. Additional phenotypic variation in IgG receptors by non-classical FCGR2C alleles. *Blood*. 2010 submitted.
5. van Oers MH, Tönnissen E, Van Glabbeke M, Giurgea L, Jansen JH, Klasa R, Marcus RE, Wolf M, Kimby E, Vranovsky A, Holte H, Hagenbeek A, van der Reijden BA. BCL-2/IgH polymerase chain reaction status at the end of induction treatment is not predictive for progression-free survival in relapsed/resistant follicular lymphoma: results of a prospective randomized EORTC 20981 phase III intergroup study. *J Clin Oncol*. 2010; 28:2246-52.