Fetal *RHD* Genotyping In The Monitoring Of RH1 Negative Pregnant Women: The Experience For The French National Center Of Perinatal Hemobiology (CNRHP)

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The technique of fetal *RHD* genotyping by PCR from maternal blood has been used for ten years at CNRHP and is continuously in progress, by the use of standardized « Free DNA fetal kit RHD » Kit CEIVD labelled (European Community *In Vitro* Diagnostic) including a DNA tracer, by automatisation of DNA extraction plasma, and recently by including amplification of *RHD* exon 5 in addition to *RHD* exon 7 and 10 to identify a majority of fetal *RHD* variants and to genotype fetuses carried by women with the silent *DPSI* gene.
Fetal *RHD* genotyping has taken a central place in the monitoring of pregnant women RH1 negative. In 2008, 887 non-invasive fetal *RHD* genotyping were made in 232 RH1 immunized women (44 negative fetuses, 181 positive, 7 indeterminate) and 653 non-immunized women (180 negative fetuses, 469 positive, 4 undetermined).
The Fetal *RHD* genotyping, performed from 12 of gestational weeks, allows diagnosis of incompatibility and adaptation of antenatal follow-up in pregnant women with alloimunization anti-RH1. On one hand: in case of positive fetal *RHD* genotype in immunized women, a specialized monitoring of pregnancy is conducted: 1) dosage and titration of antibody, 2) search for signs of fetal anemia by repetitive Doppler exams. On the other hand, for RH1 negative non-immunized pregnant women candidate for invasive prenatal diagnosis, the realization of genotyping avoids injection of IgRH if the genotype is negative. Third, systematic antenatal prophylaxis can be avoided in non-immunized RH1 pregnant women carrying a genotyped *RHD* negative foetus. A multicenter study (GENIFERH) began in January 2009 to evaluate the medico-economic impact of systematic fetal *RHD* genotyping in the monitoring of all pregnant RH1 negative women.
Non-invasive fetal *RHD* genotype helps the practitioners to greatly improve the accuracy follow-up in RH1 negative women.