HLA typing on human preimplantation embryos: the European experience

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Introduction. According to literature, two European centres perform HLA typing on preimplantation embryos: the 'Vrije Universiteit Brussel' in Brussels (Van de Velde et al. 2004) and 'Embryogen' in Rome (Fiorentino et al 2005).

Technical aspects. We were the first to report on a novel approach for indirect HLA typing on human preimplantation embryos using short tandem repeats (STRs) that are evenly distributed within the HLA locus. We now have a panel of 16 STRs out of which we select 4-6 STRs for segregation analysis (fingerprinting). Initially Fiorentino et al. (2004) had reported on the use of a minisequencing-based genotyping methodology in combination with STRs, but now they solely use STRs selecting 9-13 STRs out of a panel of 50 STRs.

Results. In Brussels, couples have been treated for beta-thalassemia, sickle cell disease, Wiskott-Aldrich syndrome (WAS), Fanconi's anemia, chronic septic granulomatosis, acute lymphoblastic leukemia (ALL) and severe aplastic anemia. In Rome, couples have been treated for beta-thalassemia, WAS, Diamond-Blackfan anemia and ALL.

	Vrije Universiteit Brussel	Embryogen
Couples treated	14	45
Maternal age	35.8	32.1
Cycles performed	39	60
Embryos analysed	163 (4.2 per cycle)	550 (9.1 per cycle)
HLA identical embryos	27 (16.6%)	74 (15.3%)
HLA identical healthy embryos	20 (12.3%)	55 (11.4%)
Transfer cycles	14	30
Embryos transferred	18	46
Pregnancies	6	9
Clinical pregnancies	3 (21.4% per transfer)	7 (23.3% per transfer)
Babies born	2	5
Transplantations performed	0	3

Discussion. In Europe, HLA typing on preimplantation embryos (combined with PGD for monogenic diseases) is now routinely performed using STRs. At present, the overall success rate is too low. However, there is room for progress at several levels: increasing the number of embryos per cycle (decreasing maternal age) and improving implantation efficiency.