UV-B irradiation of mononuclear cells induces an apparent abolition of the ability to stimulate as well as to respond to an allogeneic mononuclear cells population in mixed lymphocyte reaction. Although the inability to respond in MLR can be easily obtained by gamma irradiation or mitomycin treatment of MNC, the inability to stimulate allogeneic MNC is a unique property of UV irradiation. This basic observation is the result of complex modifications induced by UV-B irradiation on antigen presentation and T cell activation as well as on the efferent loop of the immune response.

The clinical application of UV-B irradiation is limited to platelet concentrates (PC), owing to the high UV-B absorption by red cells. A single trial about prevention of HLA alloimmunization has been reported: patients were randomized to receive either untreated or UV-B irradiated PC. Red cell transfusion was carried on with leukodepleted concentrates using the Sepacell filter. HLA immunization was observed in 5 out of 14 patients in the control and 3 out of 18 in the UV-B group (NS). However, the mean % of panel lymphocytotoxicity was 4.4% in the UV-B group and 30.5% in the control group (p = .007). Refractoriness to platelet transfusions, observed in 6 patients in each group, was related to HLA alloimmunization in 5 out of 6 patients in the control group and in 2 out of 6 patients in the UV group. A similar study was conducted in United Kingdom in patients transfused with single donor PC: HLA immunization did not occur in the 7 patients of the UV-B group, while 1 out of 11 developed antibodies in the control group.

We recently began a three arms study in France, involving four blood centers: in the control group, patients receive PC containing a median of $200 \times 10^6$ leukocytes; in the UV-B group, PC with a similar leukocyte content are irradiated in controlled conditions with the energy of 0.5 J/cm$^2$; the third group is transfused with leukocyte-poor PC, containing a mean $7 \times 10^6$ leukocytes. Immunization occurred in 5 out of 8 patients in the control group, 1 out of 9 in
the leukocyte-poor group and in 1 out of 11 in the UV-B group (p = .05).

These trials, along with the ongoing TRAP study in the United States will enable to know more precisely which place UV-B irradiation can have in the prevention of transfusion induced HLA alloimmunization.

Extracorporeal photochemotherapy (ECP) consists in the collection of mononuclear cells, followed by their irradiation with UVA light in the presence of a photo-activable molecule-8 methoxy-psoralen being the most widely used-, and their reinjection to a patient. Experimental and clinical data suggest that ECP has potential applications in auto-immune diseases.

We conducted an ECP pilot study in 6 patients with rheumatoid arthritis (RA) previously resistant to at least 3 slow acting drugs. Each procedure consisted of Leukocyte collection using the spectra® cell separator (Cobe, USA). Irradiation was performed with the same device developed for UV-B treatment of blood components, adapted to UVA irradiation (Vilber Lourmat, Trorcy, France). The treatment schedule consisted in 8 ECP performed in three weeks. A significant clinical improvement occurred in all the patients at the end of the first week. The number of tender and swollen joints, the morning stiffness as well as the Richie index were reduced in the 6 patients. Beneficial effect was prolonged up to 6 months except in one case relapsing 50 days after beginning of therapy. Considering its excellent tolerance and efficacy, further controlled studies are warranted for this new treatment of RA.