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VISCOSIMETRIC STUDY OF FLUOROCARBON EMULSIONS AND OF THEIR MIXTURES WITH BLOOD

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In order to appreciate the hemorheologic consequences of intravenous injections of fluorocarbon emulsions on blood circulation, viscosimetric measurements were performed on the emulsions alone, and on their mixtures with human blood.

The rheofluidification, the viscoelasticity and the thixotropy of the various media may be evaluated by using a servo-controlled Couette viscosimeter with coaxial cylinders in stationary and unstationary modes.

The blood structure and its evolution in relation to the applied shear rate (between 0.03 and 30 s^{-1}) were characterized from these rheological properties. Thus, aggregation, disaggregability and deformability of the red cells could be determined when in the presence of the emulsions.

This study may be summarized as follows:

- The F-66E emulsion exhibits a newtonian rheological behavior. Its viscosity is about 3 cP at 25°C (~ 1.8 cP for human plasma).
- The rheofluidification properties of the red cell suspensions in the emulsions are due to the oncotic agent entering into the formulation of the emulsion.
- The F-66E emulsion/blood mixtures closely resemble blood in their rheological behavior.
- No significant differences with blood alone could be detected from the microscopic examination of the aggregated structure of red cells diluted in the fluorocarbon emulsions, even after several hours.

In conclusion, contact with fluorocarbon emulsions does not introduce any significant perturbation in the normal rheological behavior of blood.