The investigation of the rheological properties of whole blood is of significant importance in order to predict pathological conditions. In this work, the rheological behaviour of human whole blood, under normal physiological conditions, is investigated experimentally. The blood samples were collected from two healthy donors of different genders with similar haematocrit levels (volume concentration of erythrocytes in blood), namely 41.3% and 41.6% for the female and the male, respectively. For the shear experiments, a rotational rheometer (MCR301, Anton Paar) was used. It was equipped with a plate-plate measuring system with a roughened surface to avoid wall slip. Prior to the measurements, a new experimental protocol was established to avoid cell sedimentation and promote the homogeneity of the blood sample during the rheological measurements. Steady-shear measurements were carried out to determine the flow curve for both samples and evaluate the effect of using anticoagulant (EDTA) on this rheological property. In addition to the shear-thinning viscosity of whole blood, we found that the addition of 1.8 mg/mL of anticoagulant does not affect the steady-shear viscosity, provided the measurements are done in a short enough time interval to prevent coagulation. Large amplitude oscillatory shear measurements of whole blood were also performed using strain control, to investigate the nonlinear viscoelastic response. Whole blood exhibits viscous and elastic attributes, but the dissipation was found to be
larger than the storage properties.

Please e-mail comments to the System Administrator.