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Chiral Discrimination in the Transport of Ketoprofen and Ibuprofen Esters through an Aqueous Phase Mediated by Various Serum Albumins

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Serum albumin, one of the transport proteins in blood plasma, can recognize chirality of antiinflammatory drugs in the formation of complexes, giving different induced circular dichroism (ICD) for each of enantiomers. We carried out transport experiments of oil / water / oil (O/W/O) membrane through an aqueous phase in order to investigate chiral discrimination of serum albumins of several species against water-insoluble ketoprofen and ibuprofen alkyl esters. It has become apparent that serum albumins which act as carriers in these experiments discriminate between enantiomers of the esters in the transport in the O/W/O system using a U-shaped cell. The transport rate and the preferred enantiomer of the esters were substantially affected by pH, temperature, and species of albumin. Among five serum albumins studied, bovine serum albumin (BSA) showed the largest rate constant and rat serum albumin (RSA) manifested the highest enantioselectivity. Regarding enantiomer selectivity in the overall transport, it was anticipated that the ester uptake step plays an important role for BSA, whereas the ester release is the key step for RSA.