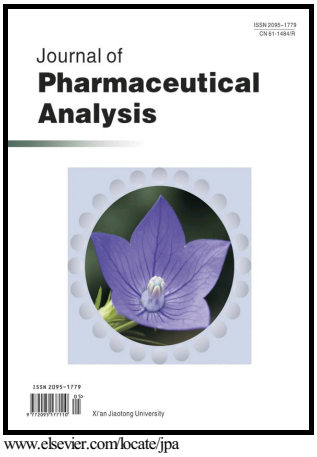

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Insight into the interaction of Inhaled Corticosteroids (ICS) with human serum albumin: a spectroscopic-based study

Carlotta Pontremoli[a], Nadia Barbero[b], Guido Viscardi[b], Sonja Visentin[c]*

[a] Department of Applied Science and Technology (DISAT), Politecnico of Torino, Corso Duca degli Abruzzi 24, Torino (Italy), 10129

[b] Department of Chemistry and NIS Interdepartmental Centre, University of Torino, via Pietro Giuria 7, 10125 Torino, Italy

[c] Molecular Biotechnology and Health Sciences Department, University of Torino, via Quarello 15, 10135 Torino, Italy.

*Corresponding author. Tel: 00390116708337.:sonja.visentin@unito.it

Abstract

It is well known that the safety and efficacy profile of an inhaled cortocosteroid (ICS) is influenced by the pharmacokinetic properties and associated pharmacodynamic effects of the drug. Freely circulating, protein unbound, active ICS can cause systemic adverse effects. Therefore, a detailed investigation of drug-protein interaction could be of great interest to understand the pharmacokinetic behavior of corticosteroids and for the design of new analogues with effective pharmacological properties

In the present work, the interaction between some corticosteroids and human serum albumin (HSA) has been studied by spectroscopic approaches. By the analysis of UV-Vis spectra it was monitored the complex formation, while by fluorescence spectrum it was observed that corticosteroids have a strong ability to quench the intrinsic fluorescence of protein. Based on fluorescence quenching results, the association and dissociation constants of drugs with HSA were determined at different temperatures. Finally, binding sites, thermodynamic parameters and binding distance of the interactions were estimated.

Keywords: Human Serum Albumin, Inhaled corticosteroids, Fluorescence spectroscopy, Fluorescence resonance energy transfer (FRET), Binding

1. Introduction

The study of protein–drug interactions plays an important role in pharmacokinetics and pharmacodynamics of drugs. They influence the distribution and elimination speed; only non-binding