

Remifentanil and Serum Albumin Interactions: Pharmacodynamics and Toxicological Implications

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SUMMARY. Remifentanil is a polyphenolic substance which exhibits some pharmacological activities such as antibacterial and antioxidant activities. Here we have investigated the binding of remifentanil with human serum albumin (HSA) at physiological pH 7.4 using spectroscopy. The Stern–Volmer quenching constant (K_{SV}) were calculated at 298, 303 and 308 K, with the corresponding thermodynamic parameters ΔG , ΔS and ΔH as well. The fluorescence quenching method was used to determine the number of binding sites ($n = 1.02$ at 298 K) and binding constants ($K_A = 5.09 \times 10^3 \text{ M}^{-1}$ at 298 K) values. Synchronous, three-dimensional fluorescence and circular dichroism (CD) results indicated that the remifentanil binding caused structural alterations of HSA.

RESUMEN. El remifentanilo es una sustancia polifenólica que exhibe actividades farmacológicas tales como antibacterianas y antioxidantes. Aquí hemos investigado la unión de remifentanilo con albúmina de suero humano (HSA) a pH fisiológico 7,4 usando espectroscopía. La constante de enfriamiento de Stern-Volmer (K_{SV}) se calcula en 298, 303 y 308 K, con los parámetros termodinámicos correspondientes ΔG , ΔG y ΔG . El método de extinción de la fluorescencia se utilizó para determinar el número de sitios de unión ($n = 1,02$ a 298 K) y las constantes de unión ($K_A = 5,09 \times 10^3 \text{ M}^{-1}$ a 298 K). Los resultados de la fluorescencia tridimensional sincrónica y el dicroísmo circular (CD) indicaron que la unión con el remifentanilo causó alteraciones estructurales de HSA.

KEY WORDS: interactions, pharmacodynamics, remifentanil, serum albumin, toxicological implications.

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