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Biophysical Study on the Interaction of Dexmedetomidine and Serum Protein

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***SUMMARY*. For understanding the pharmacology of dexmedetomidine, the binding mechanism of dexmedetomidine to human serum albumin was probed by fluorescence and calorimetric approaches. The number of binding sites and binding constant were determined to be 1.07 and 4.90 × 10^5 M^{-1} at 295 K. It was found that the fluorescence quenching was in static mode and the binding force was a hydrophobic one with a binding distance of 2.35 nm. Furthermore, circular dichroism and Fourier transform infrared spectral results indicated that the secondary structure of protein was changed in presence of dexmedetomidine, implying high level of dexmedetomidine in plasma was potentially poisonous.**

RESUMEN. Para entender la farmacología de la dexmedetomidina, el mecanismo de unión de la dexmedetomidina a la albúmina sérica humana fue determinada por fluorescencia y métodos colorimétricos. El número de sitios de unión y la constante de unión se determinaron que eran 1,07 y 4,90 × 10^5 M^{-1} a 295 K. Se constató que la extinción de la fluorescencia era en modo estático y que la fuerza de union hidrofóbica con una distancia de unión era de 2,35 nm. Además, los resultados del dicroísmo circular y los espectros infrarrojos de la transformada de Fourier indicaron que la estructura secundaria de la proteína cambió en presencia de dexmedetomidina, lo que implica que un alto nivel de dexmedetomidina en plasma puede ser potencialmente venenoso.

KEY WORDS: Binding property, Calorimetry, Dexmedetomidine, Serum albumin, Spectroscopy.

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