

A New Mixed-Ligand Coordination Complex: Protective Activity of its Nanoparticles on Acute Viral Myocarditis by Reducing TNF- α and IL-1 β

Wan-Xue HUO ¹ #, Dong-Song BAI ¹ #, Xue-Ting LIU ², Zhi-Fang ZHANG ³ & Ming ZHAO ^{1,2} *

¹ Inner Mongolia University for the Nationalities, Tongliao, Inner Mongolia, China

² First Clinical Medical of Inner Mongolia University for Nationalities, Tongliao, Inner Mongolia, China

³ Tongliao City Hospital, Tongliao, Inner Mongolia, China

SUMMARY. By applying the mixed-ligand approach, a new Ni(II)-coordination complex [Ni(bpda)(bimb)(H₂O)](H₂O) (**1**, bimb = 6,6'-bis(1H-benzo[d]imidazol-2-yl)-2,2'-bipyridine, H₂bpda = 4,4'-([2,4'-bipyridine]-2',6'-diyl)dibenzoic acid) has been successfully prepared via a hydrothermal reaction. Furthermore, a grinding method was used to produce the nanostructure **1** with the size distribution around 40-120 nm. In biological research, we aimed to determine the protective effect of nano **1** on acute viral myocarditis in mice. After constructed the CVB3-induced acute viral myocarditis model, the mice survival rate and the CVB3 titer was determined to reflect the *in vivo* activity of nano **1** and the ELISA assay was performed to detect the TNF- α and IL-1 β plasma levels after compound treatment.

RESUMEN. Aplicando el enfoque de ligando mixto, se ha preparado exitosamente un nuevo complejo de coordinación de Ni (II) [Ni (bpda) (bimb) (H₂O)] (H₂O) (**1**, bimb = 6,6'-bis (1H-benzo [d] imidazol-2-il)-2,2'-bipiridina, H₂bpda = 4,4' -([2,4'-bipiridina]-2',6'-diil) dibenzoico) mediante una reacción hidrotérmica. Además, se utilizó un método de molienda para producir la nanoestructura **1** de tamaño alrededor de 40-120 nm. En la investigación biológica, nuestro objetivo fue determinar el efecto protector de nano **1** en ratones con miocarditis viral aguda. Después de construir el modelo de miocarditis viral aguda inducida por CVB3, se determinó que la tasa de supervivencia de los ratones y el título de CVB3 reflejaban la actividad *in vivo* de nano **1** y se realizó el ensayo de ELISA para detectar los niveles plasmáticos de TNF- α e IL-1 β después del tratamiento con el compuesto.

KEY WORDS: coordination complex, mixed-ligand, myocarditis, X-ray.

* Author to whom correspondence should be addressed. *E-mail:* ming_zhao66@126.com

These authors contributed equally to this work.