

## A New Co(II) Coordination Polymer: Application Values on Atherosclerosis by Reducing the Inflammatory Response

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**SUMMARY.** A new three-dimensional (3D) porous coordination polymer (CP),  $\{[\text{Co}(\text{L})_{0.5}(\text{H}_2\text{O})]\cdot\text{NMP}\cdot\text{H}_2\text{O}\}_n$  (1), has been solvothermally synthesized by using Co(II) ions with  $\text{H}_4\text{L}$  ( $\text{H}_4\text{L} = 1,4\text{-di}(5,6\text{-bicarboxylbenzimidazol-ylmethyl})\text{benzene}$ ) in a mixed solvent of  $\text{H}_2\text{O}$  and NMP (NMP = 1-methyl-2-pyrrolidinone) solvents. The activation of the AMPK signaling pathway in the vascular endothelial cells was evaluated with the real time RT-PCR. Next, the inflammatory cytokines released by the vascular endothelial cells was measured with the ELISA detection assay. Results calculated from molecular docking simulation confirmed the experimental hypothesis that the carboxyl functional groups on the Co metal complex were the reason responding to the observed biological activity.

**RESUMEN.** Se ha sintetizado solvotermalmente un nuevo polímero de coordinación poroso (CP) tridimensional (3D),  $\{[\text{Co}(\text{L})_{0.5}(\text{H}_2\text{O})]\cdot\text{NMP}\cdot\text{H}_2\text{O}\}_n$  (1) utilizando iones Co(II) con  $\text{H}_4\text{L}$ . ( $\text{H}_4\text{L} = 1,4\text{-di}(5,6\text{-bicarboxilbencimidazol-ilmetil})\text{benceno}$ ) en un disolvente mixto de  $\text{H}_2\text{O}$  y NMP (NMP = 1-metil-2-pirrolidina). La activación de la vía de señalización AMPK en las células endoteliales vasculares se evaluó con RT-PCR en tiempo real. A continuación, se midieron las citocinas inflamatorias liberadas por las células endoteliales vasculares con el ensayo de detección ELISA. Los resultados calculados a partir de la simulación de acoplamiento molecular confirmaron la hipótesis experimental de que los grupos funcionales carboxilo del complejo metálico Co eran la razón que respondía a la actividad biológica observada.

**KEY WORDS:** atherosclerosis, coordination polymer, molecular docking.

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