



A Multi-Step Synthesis of Heterocyclic Organic Compound: Inhibiting Growth of Human Osteogenic Sarcoma Cells

Zhaoli LU¹, Yuxing LI², Hongyan ZHANG^{3*} & Xiongwei YAN^{1*}

¹ Department of Orthopaedics, ² Department of Oncology & ³ Department of Imaging,
Xiangyang Centre Hospital, Xiangyang, Hubei, China

SUMMARY. Riociguat is methyl 4,6-diamino-2-[1-(2-fluorobenzyl)-1H-pyrazolo [3,4-b]pyridin-3-yl]-5-pyrimidinyl(methyl) carbamate (**1**), designed using 1-(2-fluorobenzyl)-1H-pyrazolo[3,4-b]pyridine-3-carboxamide hydrochloride (**2**) as start material, which was successfully obtained via multiple synthesis route and finally characterized by IR, ¹H NMR, and single crystal X-ray crystallography. In addition, *in vitro* anticancer activity of the title compound **1** on three human osteogenic sarcoma cell lines (MG-63, U2OS and 143B) was further determined.

RESUMEN. Riociguat es el metil 4,6-diamino-2-[1-(2-fluorobencil)-1H-pirazolo[3,4-b] piridin-3-il]-5-pirimidinil (metil) carbamato (**1**), diseñado usando 1-hidrocloreto de (2-fluorobencil)-1H-pirazolo [3,4-b]piridina-3-carboxamida (**2**) como material de partida, que se obtuvo con éxito por vía de síntesis múltiple y finalmente se caracterizó por IR, ¹H RMN, y cristalografía de rayos X de cristal único. Adicionalmente, se determinó la actividad anticancerosa *in vitro* del compuesto **1** en tres líneas celulares de sarcoma osteogénico humano (MG-63, U2OS y 143B).

KEY WORDS: anticancer activity, human osteogenic sarcoma, Riociguat, X-ray.

* Authors to whom correspondence should be addressed. *E-mails:* hongyan_zhang666@yeah.net (Hongyan Zhang); xiongwei_yan666@yeah.net (Xiongwei Yan).