Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry. This journal is © The Royal Society of Chemistry 2017

## Copper-catalyzed chalcogenation of imidazoheterocycles with sulfur/selenium powder and coumarinyl triflates

Tao Guo,\*,<sup>a</sup> Xu-Ning Wei,<sup>a</sup> Hong-Yan Wang,<sup>a</sup> Ying-Li Zhu,<sup>b</sup> Yun-Hui Zhao,\*,<sup>c</sup> and Yong-Cheng Ma\*,<sup>b</sup>

 <sup>a</sup> College of Chemistry, Chemical and Environmental Engineering,Henan University of Technology, Zhengzhou, Henan 450001, PR China
<sup>b</sup> Clinical pharmacology Laboratory, Zhengzhou University People's Hospital,No. 7, Wei Wu Road, Zhengzhou, Henan 450002, PR China
<sup>c</sup> School of Chemistry and Chemical Engineering, Hunan University of Science and Technology, Xiangtan, Hunan 411201, PR China

**Supplementary Information** 

## **1** General procedure for antiproliferative activity assays

Exponentially growing cells were seeded into 96-well plates at a concentration of  $5 \times 10^3$  cells per well. After 24 h incubation at 37 °C, the culture medium was removed and replaced with fresh medium containing the candidate compounds in different concentrations. The cells were incubated for another 72 h. Afterward, 20 µL of MTT solution (5 mg/mL) was added to all wells and incubated for 4 h at 37 °C. Discarded the suspension and added 150 µL of dimethyl sulfoxide (DMSO) to each well and shook the plates to dissolve the dark blue crystals (formazan); the absorbance was measured using a microplate reader at a wavelength of 562 nm. Each concentration was analyzed in triplicate and the experiment was repeated three times. The average 50% inhibitory concentration (IC<sub>50</sub>) was determined from the dose-response curves according to the inhibition ratio for each concentration.

## 2 Copies of <sup>1</sup>H and <sup>13</sup>C NMR Spectra

































































9.5

9.0

8.5





















































































