Supporting Information

Synthesis of novel pyrazole-based heterocycles via a copper(II)-catalysed domino annulation

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I. General Remarks

^{1}H NMR and ^{13}C NMR spectras were recorded in DMSO-d_6 and $CDCl_3$, using a Bruker Avance-500 NMR spectrometer. Chemical shifts (in ppm) were referenced to tetramethylsilane (δ = 0 ppm) in DMSO-d_6 as an internal standard.^{13}C NMR spectras were calibrated with DMSO-d_6 (δ = 39.57 ppm). ^{1}H NMR data are reported as follows: chemical shift (δ, ppm), multiplicity (s = singlet, d = doublet, t = triplet, q= quartet, m = multiplet, bs = broken singlet, broad s = broad singlet), coupling constants (*J*) and assignment. Data for ^{13}C NMR are reported in terms of chemical shift (δ, ppm). Mass spectras were recorded by means of a triple quadrupole mass spectrometer in ES positive mode. Elemental analyses were performed using a Perkin-Elmer 2400 elementary analyzer. Melting points are uncorrected. Reactions were monitored by thin-layer chromatography (TLC) on TLC Silica Gel 60 F_{254}. Chromatograms were displayed by fluorescence quenching with UV light at 254 nm, flash chromatography purifications were carried out using Silica Gel (particle size 0.040-0.063 mm). Microwave-aided experiments were performed by using a CEM Discover™ Microwave System. All chemicals and solvents were of commercial grade and used without further purification. Starting materials **1a-i** were synthetized according to the literature,[1] completing the purification procedure with flash chromatography by means of an Teledyne Isco CombiFlash® Rf equipment (eluent: *n*-hexane/EtOAc gradient) and subsequent crystallisation from Et_2O.

[1] L. H. Pettus, R. P. Wurz, S. Xu, B. Herberich, B. Henkle, Q. Liu, H. J. McBride, S. Mu, M. H. Plant, C. J. M. Saris, L. Sherman, L. M. Wong, S. Chmait, M. R. Lee, C. Mohr, F. Hsieh, A. S. Tasker, *J. Med. Chem*., **2010**, *53*, 2973.