# Highly Regioselective Synthesis of 3-Alkenyl-Oxindole Ring-fused 3,3'-disubstituted Oxindoles via Direct gamma-substitution of Morita-Baylis-Hillman Carbonates of Isatins with 3-substituted Oxindoles <br> Ting-Ting Feng, ${ }^{a, c}$ Xuan Huang, ${ }^{a, c}$ Xiong-Li Liu, ${ }^{*}{ }^{a}$ De-Hong Jing, ${ }^{a}$ Xiong-Wei Liu, ${ }^{a}$ Feng-Ming Guo, ${ }^{a}$ Ying Zhou* ${ }^{a}$ and Wei-Cheng Yuan ${ }^{b}$ <br> ${ }^{\text {a }}$ Guizhou Engineering Center for Innovative Traditional Chinese Medicine and Ethnic Medicine, College of Pharmacy, Guizhou University, Guiyang, 550025, China <br> ${ }^{\mathrm{b}}$ Key Laboratory for Asymmetric Synthesis \& Chirotechnology of Sichuan Province, Chengdu Institute of Organic Chemistry, Chinese Academy of Sciences, Chengdu 610041, China <br> ${ }^{c}$ These two authors contributed equally to this work. 

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## Supporting Information

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## 1: General Experimental Information

The ${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR spectra were recorded on Bruker Avance DMX 400 MHz NMR spectrometers in $\mathrm{CDCl}_{3}$ and DMSO- $\mathrm{d}_{6}$ using TMS as internal standard. Chemical shifts were reported as $\delta$ values (ppm). Melting points were uncorrected and recorded on an Electothermal 9100 digital melting point apparatus. High-resolution mass spectra (HRMS-ESI) were obtained on a Micro ${ }^{\text {TM }}$ Q-TOF Mass Spectrometer. Crystals suitable for X-ray crystallographic studies were obtained by crystallization from methanol.

Reagents were purchased from commercial sources and were used as received unless mentioned otherwise. Reactions were monitored by thin layer chromatography using silica gel $\mathrm{GF}_{254}$ plates. Column chromatography was performed on silica gel (300-400 mesh).

## 2: The Copies of ${ }^{1} \mathrm{H}$ NMR and ${ }^{13} \mathrm{C}$ NMR Spectra for Compounds 3



${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ab


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ac


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ad


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ae


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3af


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ag



## ${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ah



${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ai
(


## ${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3aj




## ${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ak

(

${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ba



## ${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of $\mathbf{3 b h}$



${ }^{1} \mathbf{H}$ and ${ }^{13} \mathbf{C}$ NMR of $\mathbf{3 b b}$


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ca


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ch



## ${ }^{1} \mathbf{H}$ and ${ }^{13} \mathrm{C}$ NMR of $\mathbf{3 c j}$

(1)


## ${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3da



${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ea
(
${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3eb


${ }^{1} \mathbf{H}$ and ${ }^{13} \mathrm{C}$ NMR of $\mathbf{3 f h}$




## ${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3aa-1



${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ge


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3he


${ }^{1} \mathrm{H}$ and ${ }^{13} \mathrm{C}$ NMR of 3ie


$\begin{array}{lllllllllllllllllllllllllllllll}30 & 180 & 170 & 160 & 150 & 140 & 130 & 120 & 110 & 100 \\ f 1\end{array}$

