Coumarin-based homoisoflavonoids as precursors in the synthesis of 8-heteroarylmethylcoumarins

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Supplementary Information
$^1$H NMR spectrum of compound 1a in CDCl$_3$
$^{13}$C NMR spectrum of compound 1a in CDCl$_3$
$^1$H NMR spectrum of compound 1b in CDCl$_3$
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\begin{align*}
\text{13C NMR spectrum of compound 1b in CDCl}_3
\end{align*}
\]
$^1$H NMR spectrum of compound 1c in CDCl$_3$
$^{13}$C NMR spectrum of compound 1c in CDCl$_3$
$^1$H NMR spectrum of compound 3a in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 3a in DMSO-$d_6$
$^1$H NMR spectrum of compound 3b in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 3b in DMSO-$d_6$
$^1$H NMR spectrum of compound 3c in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 3c in DMSO-$d_6$
$^1$H NMR spectrum of compound 3d in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 3d in DMSO-$d_6$
$^1$H NMR spectrum of compound 3e in CDCl$_3$+CF$_3$COOH
$\text{C NMR spectrum of compound 3e in CDCl}_3+$

\[ \text{CF}_3\text{COOH} \]
$^1$H NMR spectrum of compound 3f in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 3f in DMSO-$d_6$
$^1$H NMR spectrum of compound 3g in DMSO-$d_6$
$\text{\textsuperscript{13}C NMR spectrum of compound 3g in DMSO-d$_6$}$
$^1$H NMR spectrum of compound 3h in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 3h in DMSO-$d_6$
1H NMR spectrum of compound 3i in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 3i in DMSO-$d_6$
$^1$H NMR spectrum of compound 4a in DMSO-$d_6$+CF$_3$SO$_3$H
$^{13}$C NMR spectrum of compound 4a in DMSO-$d_6$+CF$_3$SO$_3$H
$^1$H NMR spectrum of compound 4b in DMSO-$d_6$+CF$_3$SO$_3$H
$^{13}$C NMR spectrum of compound 4b in DMSO-$d_6$+CF$_3$SO$_3$H
$^1$H NMR spectrum of compound 4c in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 4c in DMSO-$d_6$+CF$_3$SO$_3$H
$^1$H NMR spectrum of compound 4d in DMSO-$d_6$+CF$_3$SO$_3$H
$^{13}$C NMR spectrum of compound 4d in DMSO-$d_6$+CF$_3$SO$_3$H
$^1$H NMR spectrum of compound 4e in DMSO-$d_6$+CF$_3$SO$_3$H
$^{13}$C NMR spectrum of compound $4e$ in DMSO-$d_6$+CF$_3$SO$_3$H
$^1$H NMR spectrum of compound 4f in DMSO-$d_6$+CF$_3$SO$_3$H
$^{13}$C NMR spectrum of compound 4f in DMSO-$d_6$+CF$_3$SO$_3$H
$^1$H NMR spectrum of compound 4g in DMSO-$d_6$+CF$_3$SO$_3$H
$^{13}$C NMR spectrum of compound 4g in DMSO-$d_6$+CF$_3$SO$_3$H
$^1$H NMR spectrum of compound 4h in DMSO-$d_6$+CF$_3$SO$_3$H
$^{13}$C NMR spectrum of compound 4h in DMSO-$d_6+$CF$_3$SO$_3$H
\(^1\)H NMR spectrum of compound 5a in DMSO-\(d_6\)
$^{13}$C NMR spectrum of compound 5a in DMSO-$d_6$. 

![Chemical Structure of Compound 5a]
$^1$H NMR spectrum of compound 5b in DMSO-$d_6$
\textsuperscript{13}C NMR spectrum of compound 5b in DMSO-\textit{d}_6
$^1$H NMR spectrum of compound 5c in CDCl$_3$+CF$_3$COOH
\(^{13}\text{C}\) NMR spectrum of compound 5c in DMSO-\(d_6\)
$^1$H NMR spectrum of compound 7a in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 7a in DMSO-$d_6$
$^1$H NMR spectrum of compound 7b in DMSO-$d_6$
\[ 13\text{C NMR spectrum of compound } 7b \text{ in DMSO-}d_6 \]
$^1$H NMR spectrum of compound 8a in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 8a in DMSO-$d_6$
$^1$H NMR spectrum of compound 8b in DMSO-$d_6$
$^{13}$C NMR spectrum of compound $8b$ in DMSO-$d_6$
$^1$H NMR spectrum of compound 9a in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 9a in DMSO-$d_6$
$^1$H NMR spectrum of compound 9b in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 9b in DMSO-$d_6$
$^1$H NMR spectrum of compound 10a in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 10a in DMSO-$d_6$
$^1$H NMR spectrum of compound 10b in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 10b in DMSO-$d_6$
$^1$H NMR spectrum of compound 10c in DMSO-$d_6$
$^{13}$C NMR spectrum of compound 10c in DMSO-$d_6$
\(^1H\) NMR spectrum of compound \textbf{10d} in DMSO-\(d_6\)
$^{13}$C NMR spectrum of compound 10d in DMSO-$d_6$