Discovery and Optimization of Novel 3-Piperazinyl Coumarin Antagonist of Chemokine – like factor 1 with Oral Activity against Inflammation in Asthma Mice

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Spectra Compound 21-62
$^1$H NMR of Compound 21

$^1$H NMR of Compound 22
\( ^1\text{H NMR of Compound 23} \)

\[ \text{HO} \quad \text{OH} \quad \text{OO} \]

\( ^{13}\text{C NMR of Compound 23} \)
$^1$H NMR of Compound 24

$^{13}$C NMR of Compound 24
$^1$H NMR of Compound 25

$^1$H NMR of Compound 26
$^1$H NMR of Compound 27

$^1$H NMR of Compound 28
$^{13}$C NMR of Compound 28

$^{1}$H NMR of Compound 29
\(^1\)H NMR of Compound 30

\[ \text{Structure of Compound 30} \]

\(^1\)H NMR of Compound 31

\[ \text{Structure of Compound 31} \]
$^1$H NMR of Compound 32

$^1$H NMR of Compound 33
$^1$H NMR of Compound 34

$^{13}$C NMR of Compound 34
$^1$H NMR of Compound 41

$^{13}$C NMR of Compound 41
$^1$H NMR of Compound 42

$^1$H NMR of Compound 43
$^1$H NMR of Compound 44

$^1$H NMR of Compound 45
\textbf{\(^1\text{H} \text{NMR of Compound 49}}\)

![1H NMR spectrum]

\textbf{\(^{13}\text{C} \text{NMR of Compound 49}}\)

![13C NMR spectrum]
$^1$H NMR of Compound 50

$^{13}$C NMR of Compound 50
$^1$H NMR of Compound 51

$^{13}$C NMR of Compound 51
$^1$H NMR of Compound 52

$^1$H NMR of Compound 53
$^{13}$C NMR of Compound 53

$^{1}$H NMR of Compound 54
$^1$H NMR of Compound 55

$^1$H NMR of Compound 56
$^1$H NMR of Compound 57

$^1$H NMR of Compound 58
$^1$H NMR of Compound 59

$^1$H NMR of Compound 60
$^1$H NMR of Compound 61

$^1$H NMR of Compound 62