New Synthetic Routes to Chain-Extended Selenium, Sulfur, and Nitrogen Analogues of the Naturally-Occurring Glucosidase Inhibitor Salacinol and their Inhibitory Activities Against Recombinant Human Maltase Glucoamylase

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**General Experimental:** Optical rotations were measured at 23°C. $^1$H and $^{13}$C NMR spectra were recorded at 500 and 125 MHz respectively. All assignments were confirmed with the aid of two-dimensional $^1$H, $^1$H (COSYDFTP) or $^1$H, $^{13}$C (INVBTP) experiments using standard pulse programs. Column chromatography was performed with Silica gel 60 (230-400 mesh). MALDI mass spectra were obtained on samples dispersed in a 2,5-dihydroxybenzoic acid matrix. High resolution mass spectra were obtained by the electrospray ionization (ESI) technique, using a TOF mass spectrometer at 10000 RP.
500 MHz, CDCl$_3$, 298K
125 MHz, CDCl₃, 298 K
$\delta$ ppm (t1)

500 MHz, CDCl$_3$, 298K

![Chemical Structure](image_url)
125 MHz, CDCl₃, 298K

14

- O
- S
- O
- O
- MeO
- O
- O
- Me
- O
- O
- O
- O
- O
$\delta$ (ppm) (t1)

500 MHz, CDCl$_3$, 298K
21

500 MHz, (CD₃)₂CO, 298K
$^{125}$MHz, (CD$_3$)$_2$CO, 298K
500 MHz, (CD$_3$)$_2$CO, 298K
ppm (f1)

500 MHz, (CD$_2$)$_2$CO, 298K
500 MHz, (CD$_3$)$_2$CO, 298K
ppm (t1)

500 MHz, (CD$_3$)$_2$CO, 298K

22

PMBO OPMB

PMB

OMe
500 MHz, (CD$_3$)$_2$CO, 298 K
125 MHz, (CD$_3$)$_2$CO, 298 K

Structure:

![Molecular Structure](image)
500 MHz, CD$_2$Cl$_2$, pH = 8, 298K
125 MHz, CD$_2$Cl$_2$, pH = 8.298K
500 MHz, CD$_2$Cl$_2$, pH = 8, 298K
500 MHz, CD$_3$OD, 298 K
ppm (t1)

50

100

125 MHz, CD$_2$OD, 298K
S27

500 MHz, CD3OD, 298K

30
125 MHz, CD$_3$OD, 298K
500 MHz, CD$_3$OD, 298K
ppm (t1)

3.50  4.00  4.50  5.00  5.50  6.00  6.50  7.00

S

O

OBn

OH

OH

OSO$_3$

HO

31

500 MHz, D$_2$O, 298K
$S_{32}$

$ppm (t_1)$

$50, 60, 70, 80, 90, 100, 110, 120, 130$

$125$ MHz, D$_2$O, 298K

$31$
500 MHz, D$_2$O, pH = 8.298 K
125 MHz, D$_2$O, pH = 8, 298K
S35 ppm (t1)

3.0 4.0 5.0 6.0 7.0

N O

HO

HO

OH OB

OHOH

OSO

32

32

500 MHz, D2O, pH = 8, 298K
125 MHz, D$_2$O, pH = 8, 298K
125 MHz, D$_2$O, 298K
ppm (f1)

3.50 4.00 4.50 5.00

Se

OH

HO

HO

OH

OHOH

500 MHz, D2O, 298K
ppm (t1)

125 MHz, D$_2$O, 298K
7

500 MHz, D₂O, pH = 8.2, 298K
125 MHz, D_{2}O, pH = 8, 298K

ppm (H)
500 MHz, D$_2$O, pH = 8, 298K
ppm (t1)

55.0 60.0 65.0 70.0 75.0 80.0 85.0

N  OH
HO
HOOH  OH
OSO3K  OH

125 MHz, D2O, pH = 8.2, 298K