Total Selective Synthesis of Enantiopure $O^1$-Acyl-3-aminoalkan-1,2-diols by Ring-Opening of Amino Epoxides with Carboxylic Acids.

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General: All reactions were carried out under an atmosphere of dry $N_2$ using oven-dried glassware and syringes. All reagents were purchased in the higher quality available and were used without further purification. $BF_3\cdot OEt_2$ was distilled from CaH$_2$ and stored over activated 4Å molecular sieves. The solvents used in column chromatography, were obtained from commercial suppliers and used without further distillation. TLC was performed on aluminium-backed plates coated with silica gel 60 with F$_{254}$ indicator (Scharlau). Flash column chromatography was carried out on silica gel 60 with 230-240 mesh. $^1$H NMR (200, 300, 400 MHz) and $^{13}$C NMR (50, 75, 100 MHz) spectra were measured at room temperature, with tetramethylsilane ($\delta = 0.0$, $^1$H NMR) or CDCl$_3$ ($\delta = 77.00$, $^{13}$C NMR) as internal standard. Carbon multiplicities were assigned by DEPT techniques. Low-resolution electron impact mass spectra (EI-LRMS) were obtained at 70 eV, and the intensities are reported as a percentage relative to the base peak after the corresponding $m/z$ value.

$^{13}$C-RMN of 5, 8 and 9:

(2R,3S)-$O,O$-Diacetyl-3-dibenzylamino-5-methylhexan-1,2-diol (5a)……………………………………… 3S
(2R,3S)-$O,O$-Diacetyl-3-dibenzylamino-4-phenylbutan-1,2-diol (5b)……………………………………… 3S
(2R,3S)-$O,O$-Dicinamoyl-3-dibenzylamino-4-phenylbutan-1,2-diol (5c)……………………………………… 4S
(2R,3S)-$O^1$-Hexanoyl-3-dibenzyaminobutan-1,2-diol (8a)………………………………………………… 4S
(2R,3S)-$O^1$-(3-Phenylpropenoyl)-3-dibenzyaminobutan-1,2-diol (8b)……………………………………… 5S
(2R,3S)-$O^1$-Acetyl-3-dibenzylamino-5-methylhexan-1,2-diol (8c)……………………………………………… 5S
(2R,3S)-O^1^-Hexanoyl-3-dibenzylamino-5-methylhexan-1,2-diol (8d) ........................................ 6S
(2R,3S)-O^1^-Acetyl-3-dibenzylamino-4-phenylbutan-1,2-diol (8e) .................................................. 6S
(2R,3S)-O^1^-Penta-2-enoyl-3-dibenzylamino-4-phenylbutan-1,2-diol (8f) ........................................ 7S
(2S,3S)-O^1^-Penta-2-enoyl-3-dibenzylaminobutan-1,2-diol (9a) ..................................................... 7S
(2S,3S)-O^1^-Hexanoyl-3-dibenzylaminobutan-1,2-diol (9b) .............................................................. 8S
(2S,3S)-O^1^-Acetyl-3-dibenzylamino-5-methylhexan-1,2-diol (9c) ..................................................... 8S
(2S,3S)-O^1^-Hexanoyl-3-dibenzylamino-5-methylhexan-1,2-diol (9d) ................................................. 9S
(2S,3S)-O^1^-Acetyl-3-dibenzylamino-4-phenylbutan-1,2-diol (9e) ..................................................... 9S
(2S,3S)-O^1^-Penta-2-enoyl-3-dibenzylamino-4-phenylbutan-1,2-diol (9f) ........................................ 10S