



*N*-(4-Azido-2-nitrophenyl)glycine (ANP-glycine),<sup>5</sup> containing a photolabile nitroaryl azide group, has a suitably protected carboxylic acid group and could be coupled selectively to the 3 $\beta$ -hydroxy group of the vitamin D skeleton *via* an ester linkage. Furthermore, photolysis of the coupled product could be effected at  $\lambda$  400–450 nm without affecting the sensitive triene system of vitamin D.

Low temperature regiospecific acetylation of 1,25-dihydroxycholesta-5,7-diene-3 $\beta$ -ol (**1**) furnished the 3-acetate (**2**). Photolysis<sup>6</sup> of (**2**) produced the previtamin derivative (**3**). Preparative t.l.c. separation and thermal isomerization of (**3**) furnished 1,25-(OH)<sub>2</sub>-D<sub>3</sub> acetate (**4**). Silylation of (**4**) with *t*-butyldimethylsilyl trifluoromethanesulphonate<sup>7</sup> produced (**5**), which in turn, was deacetylated with 10% KOH in ethanol to produce 1-*t*-butyldimethylsilyloxy-25-hydroxyvitamin D<sub>3</sub> (**6**). Dicyclohexylcarbodiimide (DCC) coupling of (**6**) with ANP-glycine gave (**7**). Finally, desilylation of (**7**) with 5% HF in acetonitrile provided the desired product (**8**) (Scheme 1).

The 250 MHz <sup>1</sup>H n.m.r. spectrum (CDCl<sub>3</sub>) of (**8**) was as follows:  $\delta$  0.55 (s, 3H, 18-Me), 0.95 (d, 3H, *J* 6.02 Hz, 21-Me), 4.09 (d, 2H, *J* 5.44 Hz, CH<sub>2</sub>CO), 4.39 (m, 1H, 1-H), 5.04 and 5.37 (broad s, 2H, 19-H), 5.33 (m, 1H, 3-H), 5.99 and 6.31 (ABq, 2H, *J* 11.31 Hz, 6,7-H), 6.71 (d, 1H, aromatic H), 7.12 and 7.16 (dd, 1H, NH), 7.9 (narrow d, 1H, aromatic H), and 8.36 (m, 1H, aromatic H). In the u.v. spectrum (EtOH) of (**8**), the characteristic  $\lambda_{\max}$  at 265 nm of vitamin D was masked by the aromatic absorption in this region ( $\lambda_{\max}$  258 nm and a broad peak at 450 nm). The i.r. spectrum (CHCl<sub>3</sub>) of (**8**) has strong absorptions at 2130 (azide) and 1745 cm<sup>-1</sup> (ester) along with broad absorptions between 3300 and 3600 cm<sup>-1</sup>.

Bioassay of the synthetic analogue (**8**) with calcium and rats deficient in vitamin D indicated that this compound stimulated intestinal calcium transport and bone calcium mobilization. A binding study of (**8**) with chick intestinal cytosolic preparation showed that (**8**) was, indeed, capable of competing with 1,25-(OH)<sub>2</sub>-D<sub>3</sub> for binding sites.

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