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3,17a-DIAZA-A,D-BISHOMOANDROST-4a-ENE-4,17-DIONE(1,2)

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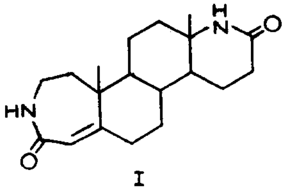
In the synthesis of 3,17a-diaza-A,D-bishomoandrost-4a-ene-4,17-dione (I) there has been obtained a compound which is itself of interest and is also of significance since from this key substance there can be prepared various synthetic analogues of potential medicinal value.

17a-Aza-D-homoandrost-5-en-3β-ol-17-one, the structure of which is well established(3,4), yields 17a-aza-D-homoandrost-4-ene-3,17-dione (II) by Oppenauer oxidation. The compound II when subjected to Schmidt reaction in polyphosphoric acid(5) gave in 34.7 % yield the diaza analogue I, m.p. above 300° (EtOH-$CHCl_3$), $[\alpha]_D^{20}$ + 37.2° (c., 0.33 in $CHCl_3$), λ_{max}^{MeOH} 219.5 mµ (logε 4.31), λ_{max}^{KBr} 3.0, 3.2, 6.05, 6.16, 6.30 µ, (Anal calcd for $C_{19}H_{28}N_2O_2$; C, 72.11; H, 8.92; N, 8.85 %. Found: C, 71.97; H, 9.08; N, 8.76 %). The structure of I is evident from its ultraviolet absorption



I

data(6). The lactam I was also obtained in 54.5 % yield by Beckmann rearrangement with thionyl chloride in dioxane of the oxime of II, m.p. 280-1° (decomp) (MeOH), $[\alpha]_D^{20}$ + 102.5° (c., 1.28 in $CHCl_3$), λ_{max}^{MeOH} 240 mμ (log ε 4.53), (Anal calcd for $C_{19}H_{28}N_2O_2$: C, 72.11; H, 8.92; N, 8.85 %. Found: C, 71.94; H, 8.63; N, 8.97 %). Beckmann rearrangement of unresolved androst-4-ene-3,17-dione dioxime(7) also yielded in small quantity a lactam, m.p. above 300°, and with spectral indications comparable with I.

Though there are known aza analogues having N in more than one rings of the steroid nucleus(8,9), the diaza compound I is the first among such substances whose structure is definitely established.

References

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2. The elemental and optical rotation analyses reported in this communication were carried out by Drs. Weiler and Strauss, Oxford. The infrared spectra were done through the kind courtsey of Prof. Norman J. Doorenbos of the University of Mississippi. The ultraviolet spectra were determined on H-700 Hilger Uvispek Spectrophotometer.
3. St. Kaufmann, J. Am. Chem. Soc. 73, 1779 (1951).
4. B.M. Regan and F.N. Hayes, J. Am. Chem. Soc. 78, 639 (1956).
5. N.J. Doorenbos and M.T. Wu, J. Org. Chem. 26, 2548 (1961).
6. R.H. Mazur, J. Org. Chem. 26, 1289 (1961).
7. E.B. Hershberg, J. Org. Chem. 13, 542 (1948).
8. M. Schenck, Z. Physiol. Chem. 89, 360 (1914); Z. Physiol. Chem. 223, 259 (1934).
9. N.J. Doorenbos and H. Singh, J. Pharm. Sci. 50, 628 (1961).