Nineteen-Step Total Synthesis of (+)-Phorbol

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*Nature 2016, 532, 90–93*

What is the name of the starting material and how would you classify it?

(+)-3-Carene, a bicyclic monoterpenne

7) Name and mechanism of the reaction?

*Mukaiyama hydration (see below)*

8) Hint: TFDO oxidation of a methylene carbon

11) Hint: multistep reaction - after addition of Ac₂O two new rings have formed - after Et₃N cyclopropane ring formed again

What is the name of the starting material and how would you classify it?

(+)-3-Carene, a bicyclic monoterpenne
12) TsNHNH₂ then NaBH₃CN
13) CrO₃, 3,5-dimethylpyrazole
14) TMSN₃ then I₂, pyridine
15) Me₄Sn, AsPh₃, PdCl₂(PhCN)₂, Cul
16) HF-Py
17) Martin sulfurane then SeO₂
18) NaBH₄ then Ac₂O, DMAP
19) NaBH(OAc)₃ then TBAF then Ba(OH)₂

13) What is the role of 3,5-dimethylpyrazole?
   Complexation of CrO₃ and abstraction of an allylic hydrogen atom

17) Structure of Martin sulfurane? What name reaction is taking place in this step and what is the mechanism?

(+) phorbol