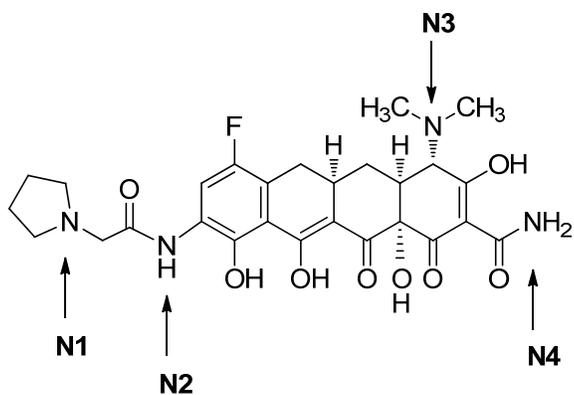




2. Eravacycline (structure shown below) is a synthetic fluorocycline antibacterial agent which is currently in the phase 3 clinical trial.



a. What is the hybridization of each N atom?

N1 \_\_\_\_\_      N2 \_\_\_\_\_      N3 \_\_\_\_\_      N4 \_\_\_\_\_

b. In what type of orbital does the lone pair of electrons reside on each N atom?

N1 \_\_\_\_\_      N2 \_\_\_\_\_      N3 \_\_\_\_\_      N4 \_\_\_\_\_

c. What is the bond angle between the carbon, nitrogen and lone pair of electrons for N4 nitrogen atom?