Highly stereoselective directed reactions and an efficient synthesis of azafuranoses from a chiral aziridine

**Problem:**

- Give the structure of 3 and explain the stereoselectivity
- Give the mechanism for the formation of 4
- Give a possible synthesis for starting material 1
  
  *(Hint: During the synthesis diastereomers were separated by FC)*
Solution:

\[
\begin{align*}
\text{(1)} & \quad \begin{array}{c}
\text{Me}_3\text{Si-O} \\
\text{Me}_3\text{Si-O}
\end{array} \\
\text{(2)} & \quad \begin{array}{c}
\text{Me}_3\text{Si-O} \\
\text{Me}_3\text{Si-O}
\end{array}
\end{align*}
\]

\[
\begin{align*}
\text{3} & \quad \begin{array}{c}
\text{Me} \\
\text{OH}
\end{array} \\
\text{3'} & \quad \begin{array}{c}
\text{Me} \\
\text{X}
\end{array}
\end{align*}
\]

\[
\begin{align*}
\text{4} & \quad \begin{array}{c}
\text{Me} \\
\text{OH}
\end{array}
\end{align*}
\]
**Comments:**
The newly formed C-N bond for the ring was controlled only by the configuration of the lactone to lead to the [5,5']-bicyclic compound.

**References:**

**Keywords:**
Stereoselective aziridine opening (chelation control), intramolecular cyclization