

$$\begin{aligned}
 &P(\textit{Target in Cell}_i \cap \textit{Observations}_t \cap \textit{Failure in Cell}_j) = \\
 &P(\textit{Observations}_t) P(\textit{Target in Cell}_i \mid \textit{Observations}_t) \times \\
 &P(\textit{Failure in Cell}_j \mid \textit{Target in Cell}_i \cap \textit{Observations}_t)
 \end{aligned}$$