Mutations are an important concept for students to learn in biology classes, especially when learning about genetics or cancer. The “Tobacco Induced Mutations” lab introduced in this paper is based on the “gold standard” assay for mutagenicity, the Ames assay, but differs in the type of bacteria used. This activity provides a meaningful context for students to learn about the concept of mutations by using a known carcinogen that is a popular news topic, tobacco. “Tobacco Induced Mutations” emphasizes the scientific method, while providing a hands-on lab that allows students to see when mutations have occurred in bacteria exposed to a tobacco extract (the bacteria colonies turn from red to white).

In addition to visually demonstrating when a mutation has occurred, “Tobacco Induced Mutations” imparts an important toxicological concept of the dose/response relationship – the higher the dose, the greater the response. Students are amazed when they see most of the bacteria change color at the higher doses. They are even more amazed when they see mutations at extremely low...