CRISPR could yield cyanide-free cassava, helping protect health of a billion people

“Roughly a billion people around the world rely on cassava as a source of calories, including around 40 percent of Africans ….” says Jessica Lyons, principal investigator of this cassava genome editing project at IGI.

Cassava is important, but it also comes with a built-in problem …. Cassava roots naturally produce the precursor of cyanide. Over time, consuming cyanide can have effects that range from subtle cognitive problems to konzo, a severe disease characterized by sudden and irreversible paralysis of the legs.

Proper processing can remove cyanide from cassava, but many people are eating insufficiently processed cassava. This is a problem particularly in parts of sub-Saharan Africa that have experienced drought, famine, and instability. The effects of the toxicity are worse in places where people don’t have easy access to protein in their diets, which helps detoxify cyanide and mitigates its effects.

To make cyanide-free cassava a reality, Lyons, [Michael Gomez, a postdoc in the Staskawicz Lab at IGI] and the team of researchers are using CRISPR genome editing to block the production of cyanide.

“We first applied CRISPR to engineer resistance to a problematic disease in East and Central Africa called cassava brown streak disease, in collaboration with the Danforth Plant Science Center in St. Louis, Missouri,” says Gomez. “We used CRISPR to target two specific genes, and showed a reduction in severity and incidence of symptoms.”

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