Q & A

What was your first cool chemistry experiment—one that turned you on to research before you were a bona fide scientist?

Many scientists began experimenting well before their first paycheck. Here, a few describe the experiments that made them realize their calling.

— Edited by Nicole Kresge

Keiko Torii
HHMI-GBMF Investigator
University of Washington

“My first chemistry experiment at home was growing large crystals of potash alum—potassium aluminum sulfate. It was very easy to purchase this chemical because Japanese people use it for food preparation. You make a highly saturated solution of potash alum, hang a small granule of potash alum in it, and then let it cool down. If you’re lucky, you yield a few carats, or even larger, of beautiful octahedron crystal! I got into experimenting with the conditions—changing the initial temperature and speed of cooling, altering the size of the initial core granule and the way it hangs—to figure out how I could make bigger, prettier crystals.”

Sinisa Urban
HHMI Early Career Scientist
The Johns Hopkins University School of Medicine

“Just before starting grad school, I was studying DNA replication in hepatitis B virus, which synthesizes its DNA inside a viral core particle. I was looking at what happens to the byproduct of this reaction, pyrophosphate, in such a confined space, using a variety of radiolabeled reactants on different phosphates. I was amazed that, by putting the label on different atoms of the same basic molecules, I could follow all aspects of the reaction. To analyze my results, I ran thin-layer chromatograms, which was unbelievably cool, because I could use first-year undergrad chemistry techniques to tackle a state-of-the-art question. This experience taught me to never underestimate the importance of simple chemistry in solving complex problems!”

Roger Y. Tsien
HHMI Investigator
University of California, San Diego

“There are two experiments I remember best. First, ‘silica gardens,’ in which crystals of metal salts dropped into a solution of sodium silicate developed bright magenta, green, or blue gelatinous coatings from which vertical dendrites sprouted. The second involved a strongly alkaline aqueous solution of potassium permanganate, which colored the liquid an intense purple. As I passed this solution through a folded cone of filter paper, its color changed to a beautiful green, reflecting reduction of permanganate, presumably by the cellulose. Both experiments reflect an early and long-lasting obsession with pretty colors.”

Loren L. Looger
JFRC Group Leader
Janelia Farm Research Campus

“Like any little kid, I was really into making a big mess. Every child stumbles onto the baking soda and vinegar volcano. Word on the street was that this was a chemical reaction. This is true: covalent bonds are broken and formed. Another trick was adding a bunch of salt to a glass of Coke, resulting in a huge, bubbling mess capable of sliming nearby friends or enemies. This was also rumored to be chemistry, but that’s not the case. No new compounds are made or destroyed—I was just accelerating a state change that was already proceeding. It’s a nice example of things not always being what they seem.”