

A Huge Impact on Productivity in Our Lab

California State University at San Marcos Customer Case



On a scenic drive up the I-15 in southern California, I got to take a tour of the undergraduate lab at California State University, San Marcos with Dr. Robert Iafe. His lab is one of the first to have the new Biotage Selekt Flash Purification System paired with the Sfär columns. We discussed the impact on his undergraduates broadening capabilities to learn about new instruments, and how it has affected his own research in his goals to gain tenure at the university.

By Sarah Moran

Can you tell us about your position and your background?

I am an Assistant Professor of organic chemistry. I earned my PhD at UCLA in 2011 and held a three-year visiting assistant professorship at the Claremont Colleges. I've now been at California State University at San Marcos for the past five years. Currently, I teach lower division and advanced organic chemistry and am the Program Coordinator for the Master's Program at CSUSM.

Can you describe your current area of research?

We're investigating a couple of big projects right now. We stumbled upon some gold reactions that are pretty novel. Traditionally, gold(I) catalysts react with alkenes, however we're finding new reactivity with benzylic alcohols. We're also developing new synthetic methods for small bioactive molecules for drug design.

Are you using automated systems in those experiments?

The Selekt has really been the workhorse for us in these experiments and all projects in general. What's impressive is

this instrument can separate small scale, 100 mg reaction, to large scale reactions, which we've done up to a 5-gram separation. My students had a couple fractions co-elute, but once they figured out only 5 mg out of 5 grams coeluted, I just shake my head and laugh. They have access to so much more instrumentation than I did.

How often have you used automated systems in your career?

This is the first for me. I've been on cloud nine ever since we got the Selekt. It makes columns less scary for undergrads. Their output skyrocketed once we added it to our lab. One student has been able to complete 6 columns per day. And if you think about the traditional glass columns, the occupied bench space alone wouldn't be feasible. Thinking about a three-hour column versus a five to ten-minute separation, it's night and day, there's no question. It's made a huge impact on productivity in our lab.

In a university setting, how do you work with students in your research?

One of the benefits of the CSUSM campus is we still have a small student/teacher ratio. So, the likelihood of a student to match up with a research lab is quite high. I work with students in a hands-on setting in the research lab, and I try to guide my students towards the path of an independent researcher. Undergraduate students are trained on all research specific and many shared department instruments so they can be first-hand users. Students perform every synthetic and analytical step in their research project. My lab fluctuates up to ten researchers at a time, so it is quite competitive to get matched in my lab. No matter what discipline a student is aiming to study after college, students will take away essential skills from their undergraduate research experiences.



having the TLC plate programming capability to design a gradient in Selekt makes it still seem like they have a big input in their results. Third, industry currently uses automated flash purification technology to increase their productivity. Student who graduate will experience on this instrument will be more competitive in their job searches.

Do you think because this generation has such a familiarity with technology like computers and smart phones, it helps students better understand this technology in the realm of science?

Absolutely. I think Biotage was really smart making it a touch screen instead of something else. No one in the lab has any fear of touching the instrument. It's very user friendly and there's nothing that you can really break on the instrument. It also has a little bit of style which they honestly love.

How did you come about purchasing a high-performance flash platform for your educational setting?

First because I wanted one! Second, the time aspect. Research was taking so long, and I knew that the technology was out there. Third, CSUSM prides itself on preparing students for the real world. We throw them on every instrument that we have. It's in our best interest to get the Selekt to train them for the workforce. It's a great asset for them on their resumes to say they've work with an automated purification instrument.

Why do you think the automated flash system is so important for students to work on and learn from?

This instrument accomplishes three things for the students. First, the results are very excellent. Students get much better separation in a much shorter time. Instead of them training on a two-hour column, they're getting the same, if not better, results in ten minutes. Second, it makes purification less scary. There are so many moving parts when you do a glass column. Packing, loading, flow, patience, changing test tubes, it takes ten or so times before students gain confidence. But there's something magical about using an instrument to do the same thing. I think



How has your workflow been impacted by these tools?

Hugely. We also have two Initiator+ microwaves as well, and the reactivity in our gold experiment is accelerated in the microwaves. We're not getting the same reactivity with conventional heating. Without the Initiator+, our research would be non-existent.

What are you able to do now that you couldn't do before you purchased your Biotage products?

For projects where students need repetition, the Selekt works fantastically. Really, undergrads haven't had much exposure to many reactions. If you have a project that requires you to do the same thing repeatedly, the Selekt increases productivity. There are fewer things that can go wrong by using it.

What the Students Say

"I love the Selekt because I am able to repeat the same procedure over and over and get the same purification results."

Brysa Alvarado – Biochemistry

"I was satisfied with the productivity of the Selekt. I can get a lot of chemistry done in a small amount of time."

Araceli Alvarez – Biochemistry

"I feel like there is less room for human error with the Selekt. It will let you know when the solvent is about to run out, and you use less solvent than you would making your own glass column. Less waste is a big piece of it."

Emily Aguilar – Chemistry

"One of my favorite things about the Selekt is that it's user friendly. You can put in the sample name, the approximate sample mass, the TLC plates, it's all just using the touchscreen which does all the work for you."

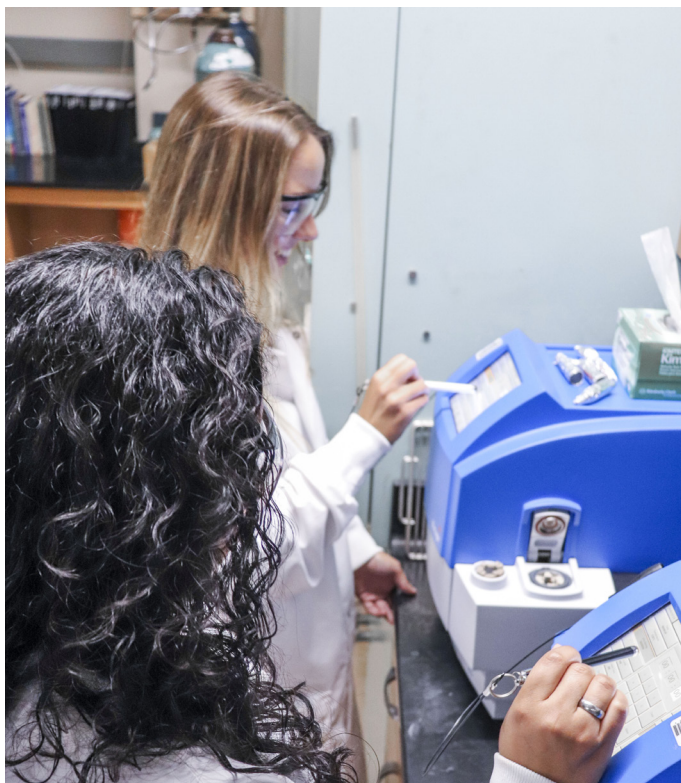
Amanda Melanese – Chemistry

"I love how fast you can get projects done on the Selekt compared to a manual column."

Kaylee Shoemaker – Biochemistry

"On our project we were having issues co-eluting a lot, but with the Selekt we can play around with the Rf values and the solvents to figure out how to pull out what we needed to get off the column. We're able to manipulate the parameters very easily. I also love that you can go back and look at all the runs to check into something. Using the USB function as well has been great too for papers."

Roberto Leon Baxin – Biochemistry

**Dr. Iafe's Top Features on Biotage Instruments****Initiator+**

- » Only one I've ever worked with
- » Everything is self-contained
- » Safe instrument
- » Easy to maintain and easy to clean

**Selekt**

- » QR Code reader
- » TLC algorithm is great
- » Two channel system
- » UV baseline detection
- » Equilibration is quick
- » It's pretty!

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