



# Cheryle Nicole Beuning

Wednesday August 7, 2019, by [admin-STEM](#)

## **2015 Chateaubriand STEM Fellow**

**Colorado State University - Laboratoire de Coordination de Chimie, CNRS, Toulouse  
Analytical Chemistry**

Cheryle Nicole Beuning is a PhD candidate at Colorado State University, and she was a Chateaubriand fellow in 2015 at the Laboratoire de Coordination de Chimie, CNRS in Toulouse, France for 6 months.

### **In which field did you carry out your research for your PhD and what was your specific area of study?**

My Ph.D. work is in analytical chemistry. My research is bio-inorganic and analytical focused using analytical spectroscopic techniques to study divalent interpeptidic metal ion transfer in various biological systems.

### **What is your current occupation?**

I am still a graduate student, completing my Ph.D. this summer. I have not secured a position yet, but I did enter a national fellowship competition from the NRC Research Apprenticeship Program and have passed the first round of peer review of my proposed work. If I am successful I would get to work at the National Institutes of Standards and Technology.

### **Please give a brief description of the work you completed in France:**

The project I worked on with our collaborators in France included interpeptidic Cu(II) metal ion transfer kinetics between biological peptides of interest in blood, GHK and DAHK (N-terminus sequence of human serum albumin). Specifically we used tryptophan (W) quenching by a bound Cu(II) to the peptide as a signal for exchange. Upon creation of a Cu(II)-GHW complex the fluorescence of tryptophan is quenched, and when GHK or DAHK are added some Cu(II) is exchanged and the fluorescence is recovered, thus kinetic constants can be determined. We have continued this collaboration and I am working with the amyloid peptide; this peptide is most associated with the plaques of Alzheimer's disease, and transfer of Cu(II) from an amyloid peptide to GHW or DAHW.

### **How was your experience as a researcher in France?**

I had an excellent experience working in France. My host lab was very welcoming, and I enjoyed the French culture immensely. I was excited and learned a lot from the post-docs, the Ph.D. students, and of course my mentors in the Hureau lab. The lab always ate lunch together and had coffee or tea afterwards and took time to talk and relax before getting back to work. I really enjoyed the work-life balance that the French people take to heart. I had everything I needed to make our project work and had the support of everyone in the lab. It was an experience I will never forget.

### **Comments on your experience as a researcher in France and conditions in your host lab:**

The host lab was very clean, had ample instrumentation and materials for my research needs, and working in the lab was very pleasant, the security on the campus made me feel very safe. Other groups were nice to me and were genuinely excited that a US researcher wanted to study in their country. When I had a housing issue with the University of Toulouse and had to find off-campus housing, my mentor Dr. Christelle Hureau was happy to guarantee for me to rent an apartment. You can imagine living in a new country and in your first month having to go shop for a place to live was very stressful. But everything

worked out and Christelle and everyone in her group was very supportive.

### **Did or will your research in France lead to any co-publications?**

Our publication of the collaborative work resulted in a communications article in the ACS journal Inorganic Chemistry. I am actively working on measurement of Cu(II) exchange from an amyloid-beta complex to GHW and DAHW using the method development in collaboration with Christelle. This should result in a second publication.

Beuning, C. N.; Mestre-Voegtli, B.; Faller, P.; Hureau, C.; Crans, D. C., Measurement of Interpeptidic Cu(II) Exchange Rate Constants by Static Fluorescence Quenching of Tryptophan. Inorganic Chemistry 2018, 57 (9), 4791-4794.

### **Did you or one of your supervisors present your work at a seminar? Do you plan on doing so?**

We have presented this work in both poster sessions and an oral talk at national ACS meetings and at Colorado State University functions/seminars. I am unsure if Christelle has presented this work at a meeting. Debbie has presented this work at an ACS meeting as a poster when I was unavailable to go. The underlined name is the presenter.

\*\*Just recently - this week - my undergraduate mentee presented our initial findings on the Cu(II)-amyloid-beta complex to GHW in a poster session at the Orlando ACS meeting. I do not have details on this conference yet though.

1) 253rd National ACS Meeting in San Francisco, CA April 2-6, 2017, Inorganic Division Oral Presentations - Bioinorganic chemistry: "Cu(II) coordination differences in the amyloid-beta protein binding models GHK and DAHK result in varied conditional interpeptidic metal exchange rate constants", Cheryle Beuning, Beatrice Mestre, Christelle Hureau, and Debbie Crans.

2) 4th year research seminar at Colorado State University, April 19, 2017.

3) CSU Graduate Student Showcase, November 2016 "Interpeptidic Cu(II) exchange kinetics of amyloid-beta binding models measured by fluorescence" Cheryle Beuning, Beatrice Mestre, Christelle Hureau, and Debbie Crans.

4) 252nd National ACS Meeting in Philadelphia, PA 2016, Inorganic Poster Session and Sci-Mix: Bioinorganic Chemistry, poster number 396 entitled "Interpeptidic Cu(II) exchange in GHK, GHW, DAHK, and DAHW peptides: Exploring how metal coordination differences affect metal exchange rates between two peptides of similar binding affinity." Cheryle Beuning, Beatrice Mestre, Christelle Hureau, and Debbie Crans.

5) Meyers Symposium, CSU 2016, poster session, "Inter-peptidic Cu(II) exchange in GHK, GHW, DAHK, and DAHW peptides: Exploring how metal coordination differences affect metal exchange rates between two peptides of similar binding affinity." Cheryle Beuning, Beatrice Mestre, Christelle Hureau, and Debbie Crans.

### **In your opinion, did the Chateaubriand Program contribute to closer ties between your US and French labs (why or why not)?**

Yes of course, we are still actively collaborating with Christelle. We may even have another student applying to the program to work with our other collaborator Dr. Peter Faller in Strasbourg. This program has made a very positive impact on both our labs.

### **Did you improve your French while in France?**

To be honest, I did not need to speak French to work at the LCC. Most of the researchers could speak English fluently or very well. I did learn quite a bit of basic French, enough to get by at the stores, or on the bus/public transportation, but not enough to converse. I was able to figure out what most foods were, order food at restaurants, get around town on the metro, etc. The other students in the lab did teach me a few things to help me in day to day activities. Honestly, I got good at saying, "Je ne parle pas très bien le

français, pouvez-vous parler anglais???" Most people were very accommodating.

**Do you plan on returning to France in the future?**

I would love to. I do not know if that would be as a scientist or just to visit. I would love to go back for a vacation for sure or a scientific conference! I loved the food, wine, walking in the streets of Toulouse, visiting places like Bordeaux, Perpignan, Carcassonne, and of course, Paris! Generally, I found the French people to be very nice, welcoming, and helpful! I was very happy living there. I do not know if I would move permanently but it is an option, given the right circumstances.

**Did you participate in any extracurricular activities or travel while in France?**

The lab group often had outings like to go to a pub for a drink, go out to dinner, a trip to a French city, a museum, or just enjoying a stroll around Toulouse. I went to Bordeaux with two other group members for a weekend, we enjoyed the architecture and grand churches. There I had my first Confit Canard and I fell in love with the dish! As stated above, I did get to visit some amazing places. I wish I had been able to visit Perpignan in the summer, so I could have swum in the sea, instead of in January, but the seafood was delicious! Seeing the Pyrénées mountains in the south on clear day in Toulouse reminded me of home and the Rocky Mountains here in Colorado. I think the neatest experience I had was Raclette at one of our lab-mate's homes! I loved it so much that the group purchased a Raclette set for me as a going away present. I have used it many times, introducing my friends and family to a little piece of France, even finding real French Raclette cheese here in the US at a specialty cheese shop.