

RESEARCH AT THE CHARITÉ: SUMO AND UBIQUITIN INTERPLAY A NEW ROLE IN STROKE AND TUMOR GROWTH



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There's a joke in Berlin that goes something like, "What does a German say when he gets to heaven?" The German is supposed to say, "This is it?" And, what you might hear if you find yourself in the main train station in Berlin when your train is running late is: "Ladies and Gentlemen, we would like to apologize for our delay. The train will be 1 minute late in arriving. Thank you and have a good day."

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Why do I bring these two things up? Well, I think they have something to say about the German spirit. What might be viewed as pessimism and a serious demand for punctuality, I view as a constant call for innovation.

To live with a worldview that nothing is good enough might seem cynical, but it sure gets things done, especially in scientific research as I experienced during a summer at

the Center for Stroke at the Charité Universitätmedizin in Berlin.

During my two-month residency, I worked under Dr. Christoph Harms -- a brilliant scientist who said that with his balding pattern he chose the wrong career and should've ended up as a composer like Mozart -- and Dr. Christian Hoffmann -- a neurologist who called me "The American Sector" of the lab. There I studied the interplay between small-ubiquitin like modifier, or SUMO, and ubiquitin in stroke response and brain tumor development. Starting out as a plague hospital, the Charité was founded in 1710 as the epidemic spread across northern Europe and neared Prussia. Luckily, Berlin was spared from the epidemic, but even luckier was the founding of the Charité. What was first a plague hospital and later a teaching clinic for military physicians, the Charité became, in its over 300 year history, home to over half of the German Nobel Prize winners in medicine and physiology and one of the largest university hospital centers in Europe.

You might think it's odd that my research on SUMO and ubiquitin involves two different diseases, stroke and brain

tumor. However, strokes and brain tumors both share a key symptom: oxygen deprivation. During states of oxygen deprivation, SUMO and ubiquitin are highly activated. So studying this interplay through techniques like molecular cloning, cell culture, and protein analyses

could lead to therapies for boosting a protective response during stroke as well as ways of inhibiting tumor growth.

While I performed cell culture in the lab, I learned of German culture outside of it: like asking "How are

you?" is a real question not just a greeting. I discovered what Germans thought of an American like me. For example, since Michael Jordan and I are both from North Carolina,

they assumed I was very good at basketball. Unfortunately, I know those skills don't follow the transitive property.

I got to find out some of the little things about Berlin. Like how the TV Tower was built in East Berlin as a way to show its power to the West. But, East German engineers failed to design it correctly and had to smuggle in Swedish engineers to finish the job.

I went to the Eastside Gallery, a 1.3 km international memorial of freedom and the largest open-air art gallery in the world.

I did standup comedy at the Kookaburra Club in Prenzlauer Berg and the SIN Bar in Kreuzberg.

I lived in the Wedding district, which was regarded by native Berliners as the current trendy district for students and artists. So as a student, I'm in some way responsible for its coolness by the transitive property, right?

In the Wedding district, I would jog to a flak tower from WWII in

Humboldthain Park, which was used to house anti-aircraft cannons. There, I was able to get a view of Berlin's unified landscape where state-of-

the-art research at the Charité was taking place.

Despite the molecular-level research I was doing in Berlin, I continued to be amazed by the people I met there. During my first week, for instance, I met Zully, an old woman from Peru, who



invited me to dinner with friends at her apartment next door. To her, shared meals were really important. After a few dinners together, I asked if I could give her something in return. She told me to just pay it forward by including others as she'd included me. Being in a city where walls between people literally came crashing down, I realized I could do that by connecting to people through science -- as a doctor. I had connected to the members of my lab at the Charité, audiences as a comedian in Kreuzberg and Prenzlauer Berg, and Zully, an old woman from Peru. Working with human beings in all their shapes, sizes, and abilities is where I believe I find my greatest strength.

On my last day in Berlin, I ran up the flak tower to get one last view. And if someone had been there to tell me, "Matt, it's time for you to go home." I'd have said, "This is it?" It's amazing how fast two months in Berlin can go by. But in that time, I had grown more than any other period of my life.

Speaking of time, I feel compelled to say, "Ladies and Gentlemen, I apologize if reading this has distracted you from your daily routine. Please excuse me for the loss of 5 minutes of your time. Thank you and have a good day."

