

Charlotte Steenblock: How does stress impact stem cells of the hypothalamic-pituitary-adrenal axis?

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Dr. Charlotte Steenblock is a group leader at the Department of Internal Medicine at the Carl Gustav Carus University Clinic in Dresden, Germany. Her research focuses on stem and progenitor cells of the hypothalamic-pituitary-adrenal axis. Using animal models of physical and metabolic stress, she investigates the role of different kinds of stress on the proliferation, differentiation, and migration of these stem and progenitor cells. Furthermore, she aims to differentiate pluripotent stem cells into steroid-producing adrenal cortex-like cells that can ultimately serve as cell replacement therapies for patients suffering from adrenal insufficiency or congenital adrenal hyperplasia. Lastly, Dr. Steenblock researches the connections between metabolic and endocrine diseases and infectious diseases, including post-acute infectious syndromes such as long-COVID. Dr. Steenblock is happy to answer the Genomic Press Interview, providing our readers with reflections on her life and career.

Part 1: Charlotte Steenblock – Life and Career

Could you give us a glimpse into your personal history, emphasizing the pivotal moments that first kindled your passion for science?

I was born and raised in a small city in Denmark near the German border. I have always had a passion for math, and during high school, I was fortunate to have an excellent chemistry teacher who sparked my interest in science. However, when deciding what to study, I was concerned that focusing solely on math or chemistry might feel too dry. Instead, I chose to study chemistry and molecular biology at Aarhus University in Denmark. To my surprise, I found molecular biology even more captivating than math and chemistry, which led me to pursue further studies.

We would like to know more about your career trajectory leading up to your current role. What defining moments channeled you toward this opportunity?

After completing my graduate studies, I began my first postdoctoral position at the University of Southern Denmark. Shortly thereafter, I met my German husband. Together, we relocated to Germany, where I worked at various research institutions before landing in my current position.

Please share with us what initially piqued your interest in your favorite research or professional focus area.

In high school, I had to write a major report on adrenaline, which sparked my interest in the adrenal system. Despite taking a somewhat winding path in my academic career and exploring various research areas, I ultimately found a way to merge my fascination with stem cells and my interest in stress and the adrenal gland.

What impact do you hope to achieve in your field by focusing on specific research topics?

I hope to gain more insight into the mechanisms of how stress can lead to epigenetic changes that may affect individuals for the rest of their lives,



Figure 1. Charlotte Steenblock, PhD, Universitätsklinikum Carl Gustav Carus, Technische Universität Dresden, Germany.

potentially leading to conditions such as mental illness, heightened susceptibility to infections, and even cancer.

Please tell us more about your current scholarly focal points within your chosen field of science?

Currently, my team of researchers and I are focused on studying the impact of stress on adrenocortical progenitors. We utilize mice as experimental models to achieve this, allowing us to lineage trace the progenitors. These mice are subjected to various stressors, including physical stress and metabolic stress induced by a high-fat diet or different models of type 1 diabetes. Alongside examining the migration and differentiation of adrenocortical progenitors, we explore the underlying mechanisms and signaling pathways activated in these stress models.

In another project, we differentiate mouse embryonic stem cells into steroid-producing adrenocortical cells in vitro. We then assess the





survival and functionality of these differentiated cells *in vivo* by transplanting them into mouse models of adrenal insufficiency.

In recent years, amid the COVID-19 pandemic, we investigated the impact of metabolic and endocrine diseases on susceptibility to infection and the development of Long-COVID.

What habits and values did you develop during your academic studies or subsequent postdoctoral experiences that you uphold within your research environment?

During my academic training, I have learned the significance of planning to meet all deadlines. Moreover, teamwork and collaboration are indispensable for achieving any objectives.

At Genomic Press, we prioritize fostering research endeavors based solely on their inherent merit, uninfluenced by geography or the researchers' personal or demographic traits. Are there particular cultural facets within the scientific community that warrant transformative scrutiny, or is there a cause within science that deeply stirs your passions?

I concur with this perspective. Science must remain free from influence derived from the reputation of institutions, the volume of grants received by principal investigators, or their prominence in the field. Evaluation of scientific endeavors should be grounded in their inherent merit, rigorous methodology, and equitable interpretation.

What do you most enjoy in your capacity as an academic or research rising star?

The freedom to develop and explore one's own scientific hypotheses, collaboration with fellow scientists, and the privilege of educating and mentoring new trainees are all integral aspects of scientific endeavor.

Outside professional confines, how do you prefer to allocate your leisure moments, or conversely, in what manner would you envision spending these moments given a choice?

I enjoy doing sports and reading fiction, spanning genres from crime and historical novels to love stories. I also have a passion for traveling and watching good movies. I love to be with my family and friends.

Part 2: Charlotte Steenblock – Selected questions from the Proust Questionnaire¹

What is your idea of perfect happiness?

Finding a healthy balance between work, leisure, family, and personal time is essential for my well-being and happiness.

What is your greatest fear?

My greatest fears revolve around the health and well-being of my family members. Otherwise, I am generally open-minded and unafraid of new experiences.

¹In the late nineteenth century, various questionnaires were a popular diversion designed to discover new things about old friends. What is now known as the 35-question Proust Questionnaire became famous after Marcel Proust's answers to these questions were found and published posthumously. Proust answered the questions twice, at ages 14 and 20. In 2003 Proust's handwritten answers were auctioned off for \$130,000. Multiple other historical and contemporary figures have answered the Proust Questionnaire, including among others Karl Marx, Oscar Wilde, Arthur Conan Doyle, Fernando Pessoa, Stéphane Mallarmé, Paul Cézanne, Vladimir Nabokov, Kazuo Ishiguro, Catherine Deneuve, Sophia Loren, Gina Lollobrigida, Gloria Steinem, Pelé, Valentino, Yoko Ono, Elton John, Martin Scorsese, Pedro Almodóvar, Richard Branson, Jimmy Carter, David Chang, Spike Lee, Hugh Jackman, and Zendaya. The Proust Questionnaire is often used to interview celebrities: the idea is that by answering these questions, an individual will reveal his or her true nature. We have condensed the Proust Questionnaire by reducing the number of questions and slightly rewording some. These curated questions provide insights into the individual's inner world, ranging from notions of happiness and fear to aspirations and inspirations.

Which living person do you most admire?

There are only so many persons I would like to name here without one single person standing out.

What is your greatest extravagance?

Traveling.

What are you most proud of?

My three sons, who are all amazing individuals in their unique ways.

What is your greatest regret?

Typically, I say that I have no regrets!

What is the quality you most admire in people?

Honesty and a sense of humor.

What is the trait you most dislike in people?

Dishonesty.

What do you consider the most overrated virtue?

Modesty.

What is your favorite occupation (or activity)?

Reading, traveling, and spending time with the family.

Where would you most like to live?

I enjoy living in Germany, but at times, I miss my family and friends back in Denmark.

What is your most treasured possession?

My memories.

When and where were you happiest? And why were so happy then?

I have had many unforgettable moments in life. To name a few, there is the day I met my husband and the birth of our children. Additionally, my experiences while traveling around the world hold a special place in my heart. I love exploring new places and experiencing different cultures.

What is your current state of mind?

Excellent – it is spring, and the sun is shining!

What is your most marked characteristic?

I have a very positive mindset.

Among your talents, which one(s) give(s) you a competitive edge?

Efficiency and organizational skills.

What do you consider your greatest achievement?

My scientific career and to manage settling in a different country.

If you could change one thing about yourself, what would it be?

To be more extroverted.

What do you most value in your friends?

Their loyalty.

Who are your favorite writers?

So many good authors are out there, so I cannot mention just a few.

Who are your heroes of fiction?

I do not have any.

Who are your heroes in real life?

My grandmothers were remarkable women. One pursued a career in pharmacology in the late 1930s because her father believed she should have the same opportunities as her brothers. Although the other grandmother wished to pursue further studies, she faced financial constraints.



Nonetheless, she made the most of her life and always remained well-informed.

What aphorism or motto best encapsulates your life philosophy?

Stop taking things so seriously. Everything will work out.

Charlotte Steenblock¹ 

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