

I Couldn't Have a Future in Science without My Past in Dance

Bringing an art form and science together can provide innovative perspectives on the evolving biological world around us

by Katie Waldvogel

I keep a journal, where I write at least one sentence that describes a highlight from each day, and I've done this since the beginning of my freshman year of college. The entry from April 14th, 2022 was: "I had the best interview of my life today with Sage Therapeutics," and the entry from April 27th was, "I GOT THE JOB!!!"

When I had entered the zoom call for an internship opportunity with Sage Therapeutics, a pharmaceutical company in Cambridge, Massachusetts, the second-round interview immediately started to focus on my B.F.A. in Dance-Performance, listed on my resume—not my science background. After some time spent talking about dance, our conversation led to sharing our experiences with performing in musicals in high school. For the majority of the interview, we discussed the importance of having an artistic outlet outside of the analytical biology world, and how art has made us better scientists.

I probably would not have gotten the internship if it hadn't been for dance and wouldn't have bonded with my future boss without experiences of dance from years prior. Outside of this experience, devoting my life to this art form has shaped me and have given me skills that have been beneficial in the science world.

Ballet is the technique that I most strongly associate myself with because I love how precise an art it is. Even the smallest of details, like a slight tip of the chin up, or an adjustment of the thumb in, can make the biggest difference in the world. The habit of picking up these small but vital details has become incredibly useful when following laboratory procedures in my research, or when recording observations during an experiment.

When dancing with a group of people, there is a sense of community and connection that is formed across all individuals. According to Toni Bergins, the founder and director of JourneyDance, "coming together to dance is a way for us to reach out to each other for connection," and that people participating in dance, "create a mini-village, a minicommunity where everyone belongs" (Sexton, Shannon). Dance presents opportunities for people to be vulnerable and share a part of themselves or their knowledge to bond with others. Team-building environments like this strengthen collaborative efforts between people, and I feel that finding community and vulnerability within dance has improved my approach to group work in experimentation and research.

Scientists in my research group constantly talk about seeking creative solutions and looking outside of the box to find the unconventional answer. STEM courses mainly focus on true statements from false ones, the cause and effect, and the main takeaways from transformative experiments, without really delving into the possibilities of using a different path to solve a problem (besides synthesis problems in organic chemistry—that's a different story). In dance, the studio space is our own personal laboratory, trying and failing, attempting new movement phrases with our bodies, seeking the boundaries and limits of our imagination. Creativity is naturally intertwined with an art form, and it is a skill that I feel I have my own definition of and can express, even in areas of my scientific endeavors.

The intersection between dance and science is an evolving topic in research today, as scientists are interested in seeking creative solutions for diseases without known cures. Studies from PubMed, Web of Science, Science Direct, and other scientific platforms showed that from 217 patients with Parkinson's disease, dance therapies (including styles like open-air fitness dancing, Qi dance, tango, and Scandinavian folk dance) significantly improved cognition in patients, in comparison to PD patients who did not have the dance therapy treatments (Wang, Li-li). These findings provide evidence of how the use of an art form like dance has benefitted the science field, and that dance can have a positive impact on people. Studies like this could potentially lead to more discoveries relating the positive impacts of dance on individuals with neurodegenerative or other types of diseases.

As new studies find that science and art forms have a fascinating connection to each other, this connection was truly put to the test through the SciArt experiment in the Djerassi Resident Artists Program. For one month, six scientists and six artists were brought together and given the space to create and experiment together. One of the tasks given to these 12 individuals was to illustrate SARS-CoV-2 in a way that showcased the skill of both art and science. The SciArtists utilized a type of software called "CellPAINT," which could create molecular structures using a "molecular brush." Depending on the type of structure used, the software would incorporate dynamic and changing movements into the molecules to portray how each part works with others. The author of the paper, David Goodsell, was one of the scientists in the study, and stated, in regards to using art to describe biology: "...the researchers learn as much as I do as we gather information on the parts of the painting related to their work, as well as the information about the many other details that need to be included: the cellular context of their molecular work, or the molecular details of their cellular work" (Goodsell, David).

The use of art allowed scientists like Goodsell to understand the scope of the scientific topic at hand and to question the knowledge that they had, and what they needed to know going forward. This study demonstrated how incorporating art with science gave scientists a unique and creative route to access the questions they had or information they needed, and could be a new way to problem-solve for a number of different scenarios.

As a double major in dance and biochemistry at university, each day is different, filled with lessons, experiences, and knowledge that I can carry with me through life. Some days, I am in

the studios for a couple of hours, dancing in ballet and modern technique classes, and then going to rehearsals for performances. Other days, I spend time in a chemical biology lab, conducting cancer research, and going to biology classes. Being able to constantly engage both the right side and left sides of my brain through dance and biochemistry has strengthened my creativity, knowledge of the evolving world, and drive to push myself to excel. Better yet, I experience overlap of both fields often, where ideas and fundamentals of science apply to dance, or vice-versa. These moments, like applying Newton's laws of motion to grand sissonnes in ballet, or noting motifs from the Laban technique in micropipetting buffer solutions, make it all worth it in the end.



Katie Waldvogel will graduate with a B.S. in Biochemistry & Molecular Biology and B.F.A. in Dance-Performance in June of 2024. She plans to pursue a professional dance career, and eventually join the STEM field as a researcher in biology.

Photo: Jeff Mateer, Studio West Photography

Works Cited:

Goodsell, David S. "Art as a tool for science". May 7, 2021. *Nature*. Accessed March 7, 2023. <https://www.nature.com/articles/s41594-021-00587-5#:~:text=Artistic%20conceptions%20>

provide an easy way to explore, as a touchstone for future thought and research.

Sexton, Shannon. "The Science of Dance: Seven Ways that Movement Makes Us Happier and Healthier". *Kripalu: Center for Yoga & Health*. Accessed March 7, 2023. <https://kripalu.org/resources/science-dance-seven-ways-movement-makes-us-happier-and-healthier>

Wang, Li-li, et al. "Effects of dance therapy on non-motor symptoms in patients with Parkinson's disease: a systematic review and meta-analysis". Jan 29, 2022. *Aging Clinical and Experimental Research*. Accessed March 6, 2022. <https://link.springer.com/article/10.1007/s40520-021-02030-7>