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## We Are All Stars—Collaboration Builds Constellations and Galaxies

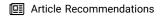


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ometimes, doing scientific research is a long and lonely journey, like running a marathon, while at the same time, it is completely fascinating! As a Ph.D. student, you study the details of your field and dive deep into it. And sometimes, the common words you use in your field become jargon for others. But new ideas and inspiration come from collective thinking and collaboration with different people. The most diverse collaborations lead to the most diverse and exciting ideas.

I was not a person good at teamwork. In the first few years of my Ph.D. program, I focused only on my research, but I did not make much progress. Figure 1 shows me at my desk, stuck on



Figure 1. A drawing of me, working in our computational chemistry

my solo research problem. After talking to a friend who often worked with different people, I realized how narrow-minded my approach was. Science is a process of trial and error, and you never know what is waiting for you. My friend had worked with people from different backgrounds, cultures, and countries with different capabilities, and this helped him solve his research problems. At first, it was a small project, but with the help of many people, it became a large and successful project. I learned a lot from him and started to change myself. I tried to help others, and they were willing to help me. The problems which were so difficult to me before suddenly became so easy to solve. I got a lot of inspiration from them. Now, collaborating with others makes me realize what a miracle science is!

In my mind, scientific research is like the stars in the sky. Each scientist shares their research with others in laboratories, at conferences, and in journals, like stars shedding light on others. Only when the results from all these different researchers are put together can we see the beautiful galaxy in space.

This artwork depicts a "constellation" of hands working together to create a beautiful galaxy in space. Each person handles a different instruments showing how different people bring expertise from different fields. One of them is doing chemical calculations for molecule prediction; one of them is preparing a reaction; one of them is measuring the amount of a reactant; one of them is mixing a liquid; and one of them is handling the temperature of the reaction. It is difficult for one person alone to finish a research project. Collaboration is essential and beautiful!

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