Description

There are two schools of thought when it comes to research collaboration. One is “two heads are better than one.” Different researchers working together on a project can produce more than twice their separate efforts if their skills and abilities compliment each other. Some of the biggest scientific achievements were achieved by collaborations. The deciphering of the DNA code by Watson and Crick is a famous example. Actually, it was the team of Watson, Crick, and Franklin, since without the superb X-ray crystallography and chemical insight of Rosaline Franklin, Watson and Crick would probably have been beaten by other groups in the race to discover the true structure. Linus Pauling was neck and neck in the race, and had plenty of insight, but lacking Franklin’s images, he was misled into proposing the wrong structure.

Another school of thought on collaboration is “too many cooks spoil the broth.” Some researchers like working on their own. Sometimes this is simply due to personalities—some people aren’t team players and some don’t like sharing credit. But anyone who has ever participated in collaboration, whether on a science project or a sailboat renovation, knows there are real problems to avoid. If the other side doesn’t do its share of the work, what do you do? Beg and plead? End the project? To avoid wasting time and effort there are several factors that are essential to make collaboration successful.

Clearly Defined Tasks

All collaborators must understand their roles. These should be agreed on before starting work and put in writing for future reference. Duplication of effort must obviously be avoided. The most successful collaborations are often those where two individuals with different expertise work on complementary efforts. One might synthesize a molecule and the other carry out computer modeling to predict its stability. Neither researcher could carry out the other’s work, but both efforts enhance each others credibility. Another fruitful collaboration would involve one party using a specialized piece of equipment at another facility. Dr. Ernest Eliel of the University of North Carolina did this in 1985 to measure kinetics by rapid-injection NMR. The only apparatus was located in Lausanne, Switzerland, so he arranged to send a graduate student there for six months to carry out the investigation. Not only were measurements successful, but at the end of the study his Swiss collaborator gave Eliel one of his injectors to take back to America, so that he might continue work on his side of the Atlantic. Now that’s a successful collaboration!

Communication

The ideal collaboration would involve colleagues at the same institution where weekly or daily conversations on progress can easily be held in a low-key manner. In a long-distance international collaboration, regularly scheduled progress reports by phone should be held with exchange of follow-up memos if necessary to clarify changes in future plans.

Some Successful Scientific Collaborations:

Brahe–Kepler

The Danish astronomer Tycho Brahe made meticulously accurate observations of the meandering movements of Mars through the heavens. The German mathematician Johannes Kepler took the data and deduced the laws of planetary motion in 1609.

Woodward–Hoffman

Based on his lab results at Harvard, Woodward had the idea for rules that would predict the stereochemistry of the products of concerted organic reactions. At Cornell, Hoffman did calculations to back him up (their rules were based on pioneering work of Kenichi Fukui. Hoffman and Fukui shared the 1981 Nobel Prize for this work.)

Woodward–Eschenmoser

In 1973 a 10-year international effort spanning two continents and involving 100 students and post-docs resulted in the synthesis of Vitamin B12, the most complex molecule made up to that time.

Category

1. Promoting Research
2. Using Social Networks

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