The palladium-catalyzed cross-coupling of organoboranes with an organic electrophile such as halides is known as the Suzuki coupling reaction. It has become an extremely versatile method for carbon-carbon bond formation. It was first published in 1979 by Akira Suzuki and he shared the 2010 Nobel Prize in Chemistry with Richard F. Heck and Ei-ichi Negishi for their effort for discovery and development of palladium-catalyzed cross couplings in organic synthesis. It is widely used to synthesize poly-olefins, styrenes, and substituted biphenyls.

Our objective is to explore the reactivity of organotellurium compounds and use them as the organic electrophile to couple with organoboranes in Suzuki coupling reactions. Although organotellurium compounds become increasingly important in organic synthesis, the use of these compounds in carbon-carbon bond formation are rather limited. We expect organotellurium compounds would show a higher reactivity in the coupling reaction and result in a milder and more eco-friendly reaction condition compared to the existing ones.

First one diaryl telluride compound was prepared by using the corresponding aryl iodide and elemental tellurium as starting materials in the presence of KOH. The diaryl telluride was then reacted with organoboranes under different palladium catalysts. We found the product was achieved in best yield when \( \text{PdCl}_2(\text{PPh}_3)_2 \) was used as the palladium catalyst. The reaction was greatly accelerated with the irradiation of microwave synthesizer. With the new method obtained, more poly-olefins and biaryl product will be prepared in less reaction time, and higher yields compared the previous methods.