

EXECUTIVE SUMMARY [NON-TECHNICAL ABSTRACT FOR PUBLIC INFORMATION OR PROGRAM PROMOTION]:

State **in layman's terms** the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project relevant to California.

Many biologically and pharmacologically active compounds arise from Chinese herbal medicines. The six neolignans we are interested in were isolated from a plant called *Rodgersia podophylla*, first identified by Asa Gray at Harvard. The plant belongs to the family of Saxifragaceae, and the rhizomes of the plant have been used for treatment of enteritis and bacillary dysentery. Moreover, these neolignans all possess a 1,4-benzodioxane ring, which is a key structure among a number of natural products. However, there is no general method to synthesize this kind of structure. When I was a postdoctoral researcher at UC Santa Barbara, I successfully oxidized phenol to *ortho*-quinone, a useful reactive intermediate in natural product synthesis. There are many applications of *ortho*-quinones, but we are especially interested in developing a hetero-Diels-Alder reaction method, which will be used to generate 1,4-benzodioxane, a core structure in many bioactive natural products as mentioned above. This method can serve as a generic approach to synthesize structurally similar natural products. The six newly isolated neolignans will be our target molecules in application of this method. We will also run a series of biological tests on the target molecules in order to check the compounds for possible pharmaceutical application.