The hydroxylated dimeric nuphar alkaloids are found in the common yellow water lily. In particular, 6-hydroxythiobinupharidine has been shown to induce apoptosis in human leukemia cell lines (U937) faster than any known small molecule. However, the only two studies concerning their biological mechanism of action are inconclusive. The first synthesis of any dimeric Nuphar alkaloids was reported in 2013, but was of an inactive compound. This lecture will describe our work in carrying out the first total syntheses of the biologically active hydroxylated dimeric nuphar alkaloids. We also report novel methods for preparing the quinolizidine core, as well as apoptosis data on several other compounds, including unnatural monomeric analogs previously unknown to nature.