**OVERVIEW:** "A Biological Approach to Documenting Traditional Ecological Knowledge in Synchronic and Diachronic Perspectives" explores ethnobotanical knowledge of Sierra Nororiental de Puebla, Mexico, Nahuat and Totonac communities to address theoretical issues in cognitive anthropology (e.g., the structure of native ethnobotanical categories), historical and contact linguistics (e.g., diachronic retention, loss, semantic shift, and innovation of ethnobotanical nomenclature), and cultural history (migration and language contact between two Mesoamerican groups). It employs an innovative molecular technology, DNA barcoding, to facilitate extensive, multisited, and comparative research on Indigenous traditional ecological knowledge while documenting this knowledge through extensive digital recordings by native natural historians.

**INTELLECTUAL MERIT:** This project forges international, interdisciplinary, and multiethnic partnerships among anthropologists, linguists, botanists, Indigenous natural historians, and molecular biologists to pursue research goals unrealistic for projects of more limited disciplinary and cultural scope. It will be carried out by a multidisciplinary team with the experience, knowledge, and research skills necessary for a synchronic and diachronic study of ethnobotanical knowledge among Indigenous communities. The innovative social science and botanical approaches to this research could be transformative, promising new interdisciplinary methods and redefining disciplinary borders. First, documentary linguistic methodology will create a corpus of digital recordings of Indigenous natural historians. This primary material will provide a permanently archived, verifiable record of how speakers, perhaps with different cognitive perspectives on the environment, negotiate meaning through discourse. Second, advances in molecular biology allow, for the first time, utilization of a DNA barcode reference library for social science research, facilitating collection and identification, at a hitherto unimagined scale, of local flora named, classified, and used by Indigenous people. The implications for linguistic, anthropological, and botanical research are profound. For language documentation it will provide a model for inclusion of ethnobotanical research in projects focusing on corpora and lexicons. For anthropology, it will allow wide-ranging, multi-sited, theoretically focused research in the region covered by the DNA barcode library. Finally, it will facilitate full collaborative participation of Indigenous communities by simplifying the collection and identification process by which ethnographic knowledge can be linked to scientifically identified species.

**BROADER IMPACTS:** This project builds collaboration among a liberal arts college (Gettysburg), three Indigenous collectives that offer a remarkable degree of support, the Smithsonian, and Mexico's National University. Four full-time Indigenous collaborators will be trained in anthropological, linguistic, and botanical research; many others will work part-time on individual projects. A Mexican advanced degree student will help coordinate research at the Smithsonian, the Instituto de Biologia, and the Indigenous collectives and will assist in DNA sequencing. The Indigenous collective Tosepan Titataniske is building an educational, exhibition, and research center that will be a hub of project activities and will host exhibitions of project results for Indigenous people, visiting students, and the general public. The project team and Tosepan's Montessori school teachers will develop pedagogical material, which, along with the primary linguistic documentation, will be placed on an open access project website. Collaboration with an Indigenous health collective, Tosepan Pajti, includes training of Indigenous herbal curers and the creation of an anthology of medicinal plant knowledge to be shared within the collective and, pending its approval, with the general public. Finally, the project will develop a "Next Generation Flora of the Sierra Nororiental de Puebla" website that will offer a complex of information unlike previous published and online Floras: 1) voucher specimen with photos of the plant in situ and mounted; 2) scientific names, including synonyms; 3) Indigenous nomenclature, classification, and symbolic and economic use; 4) selected digital recordings (transcribed and translated into English and Spanish) of native experts speaking in Nahuat and Totonac about local flora; 5) biogeographical data on species collection points in the targeted research area; 6) presentation of DNA barcode sequences.