Natural Product Drug Discovery through USA-Kenya International Collaboration

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The ongoing USA-Kenya collaborative project is funded by the Carnegie African Diaspora Fellowship (CADF) program. Kenya possesses uniquely rich biodiversity. Her indigenous plants survive under harsh environmental conditions and therefore biosynthesize biologically interesting compounds. Based on ecological observations and ethnomedicinal information, we have analyzed several plants for their chemical constituents, the search guided by various cell-based bioassays. The compounds were isolated and characterized using chromatographic and spectroscopic methods, respectively. Systematic chemical modifications of the most active compounds yielded important inf the essential structural features needed for bioactivity. These findings will serve as models for synthetic programs directed toward the production of potential therapeutic agents for mankind. To integrate research in undergraduate/graduate education, we have implemented innovative natural products research experiments in lab courses and faculty-directed independent projects. Through specific lab project modules, students learned how to design experiments that enabled them to extract, fractionate, purify, characterize, and bio-test natural products. The collaborative USA-Kenya project provided training opportunities in career development skills including ethics, laboratory safety, resume writing, writing proposals, interview skills, the graduate/professional school application process, undergraduate research opportunities, information literacy, and careers in chemistry. Bioassay data from structure-activity relationship studies will be discussed. A preview of the ongoing green nanosynthesis of anticancer chalcones (Figure 1) will be presented. Also, reports summarizing career development activities will be disseminated.

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