Drug Discovery as an Incentive for the Conservation of Biodiversity

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The island of New Guinea covers less than one percent of the world’s land mass. However, it contains more than five percent of global biodiversity which can be translated into genetic and chemical diversity that can potentially develop. The government of Papua New Guinea, through the Department of Environment and Conservation established the Papua New Guinea Institute of Biodiversity (PINBio) which oversees a number of programs encouraging research to add value to the country’s biodiversity.

Under the Biodiscove run our overall goal has been to scientifically explore the biodiversity of PNG for compounds for potential drug development. Papua New Guinea has enormous biological diversity with great potential for discovering new drugs to treat many human diseases. In addition, drug discovery can become an important tool and a powerful incentive for conservation and sustainable use of biodiversity. Our drug discovery program also complies with international agreements including compliance to provisions of the Convention Biological Diversity (CBD). We have an Access Benefit Sharing (ABS) policy that ensures that benefits flow back into the communities should research result in novel discoveries. Benefits may be monetary or non-monetary. Non-monetary benefits include capacity building, infrastructure and technology transfer which has enabled Papua New Guineans to get training at collaborating universities abroad.

Collaborations with partner institutions through the Biodiscove run have resulted in the discovery of novel compounds from terrestrial plants and marine organisms which have exhibited significant biological activities against a variety of diseases.

A recent study and bioassay guided fractionation of methanolic extract of the leaves and twigs of a PNG plant Rhus taitensis resulted in the isolation of a new triterpene, tetrahydroxysqualene, which showed anti-tuberculosis activity with an MIC of 10.0 μg/mL, while showing moderate Cytotoxicity. The structure of tetrahydroxysqualene was elucidated on the basis of HRESIMS and 1D and 2D NMR spectra.

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