

Biocode 2.0

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Project Description:

Te Ora Fenua, the Moorea Coral Reef Holobion Sequencing Project (the Project), will advance scientific understanding of the unseen biodiversity of reefs and how this diversity responds to and recovers from disturbances. The Project outcomes will help identify how human communities can alter reef health trajectories toward desirable outcomes in the face of global climate change. The Project will create new, diverse, and contextualized marine genomic resources for ecologically, culturally, and economically important organisms and their symbionts from the island of Moorea. As a natural outgrowth of the GBMF-funded Moorea Biocode Project, which built a reference collection and database of DNA-barcoded specimens for all the species (animals, plants, fungi) of Moorea (Check, 2006; Field & Davies, 2015), Biocode 2.0 will extend this community resource through four key outputs: (1) the world's first ultra-barcoded coral reef system, made by "genome-skimming" the existing Biocode DNA samples, (2) an "ethnocode framework" by connecting research findings to Indigenous genomics and data sovereignty efforts in the Pacific region, (3) a comprehensive holobiont sample and data repository by hologenome sequencing Moorea's most ecologically, economically, and bio-culturally significant coral reef species and their symbionts, and (4) an interactome map by describing functional relationships among species, microbiomes, and viromes across the island's diverse reef contexts. The four pillars are supported by a data platform, GEOME, which had its origins in Biocode 1.0 and has become a core component of national cyberinfrastructure for biosamples, helping to operationalize the FAIR and CARE data principles. Together, the four outputs will constitute an unparalleled community resource of practices, specimens, and data that will serve as a long term and stable resource to ask important scientific

questions about biodiversity in a changing planet. The Project will catalyze numerous future research endeavors and augment longstanding international research investments, such as the NSF MCR-LTER and France's CRIOBE, further establishing Moorea as a model ecosystem for science. Focusing on coral reefs, Biocode 2.0 will contribute to the U.N. Ocean Decade Program "Ocean Biomolecular Observation Network" (OBON) (Leinen et al., 2022) through the deep sequencing of an emblematic ecosystem. The Project will also advance the use of omics in biodiversity conservation, contributing to the Group on Earth Observations (GEO) "Omic Biodiversity Observations Network" (Omic BON).

Project Links

- https://docs.google.com/document/d/1G-JjmGrAtUJBqYFVFAfNc8jkovEWjQ_K/edit

Project Notices



Biocultural Notice

The BC (Biocultural) Notice is a visible notification that there are accompanying cultural rights and responsibilities that need further attention for any future sharing and use of this material or data. The BC Notice recognizes the rights of Indigenous Peoples to permission the use of information, collections, data and digital sequence information (DSI) generated from the biodiversity or genetic resources associated with traditional lands, waters, and territories. The BC Notice may indicate that BC Labels are in development and their implementation is being negotiated.

Notification BC (Bioculturelle) (French)

La notification BC sert à rendre visible l'information selon laquelle le matériel utilisé est accompagné de droits culturels et de responsabilités qui nécessitent une attention particulière au moment de le partager ou de l'utiliser. La notification BC est une reconnaissance des droits des peuples autochtones de permettre l'utilisation d'informations, de collections, de données et d'informations sur les séquences numériques provenant de la biodiversité et des ressources associées à leurs terres, cours d'eau et territoires traditionnels. La notification BC peut indiquer que les étiquettes BC (bioculturelles) sont en cours de réalisation et que leur application est en train d'être négociée. Pour plus d'information à propos des étiquettes BC, consulter le site <https://localcontexts.org/notices/biocultural-notices/>.
