Universidad Científica del Perú

EVENTO NACIONAL: DESARROLLO DE CTI EN FRUTALES NATIVOS AMAZÓNICOS, PATRIMONIO AMBIENTAL Y ALIMENTARIO

PLATAFORMAS PARA MEJORAMIENTO GENÉTICO EN FRUTALES NATIVOS

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Amazonía Peruana: Biodiversidad (organismos desconocidos por la ciencia).

- ☐Explotarlo con **estrategias sostenibles**, ecoamigables que mejoren la situación socioeconómica de la región y el país.

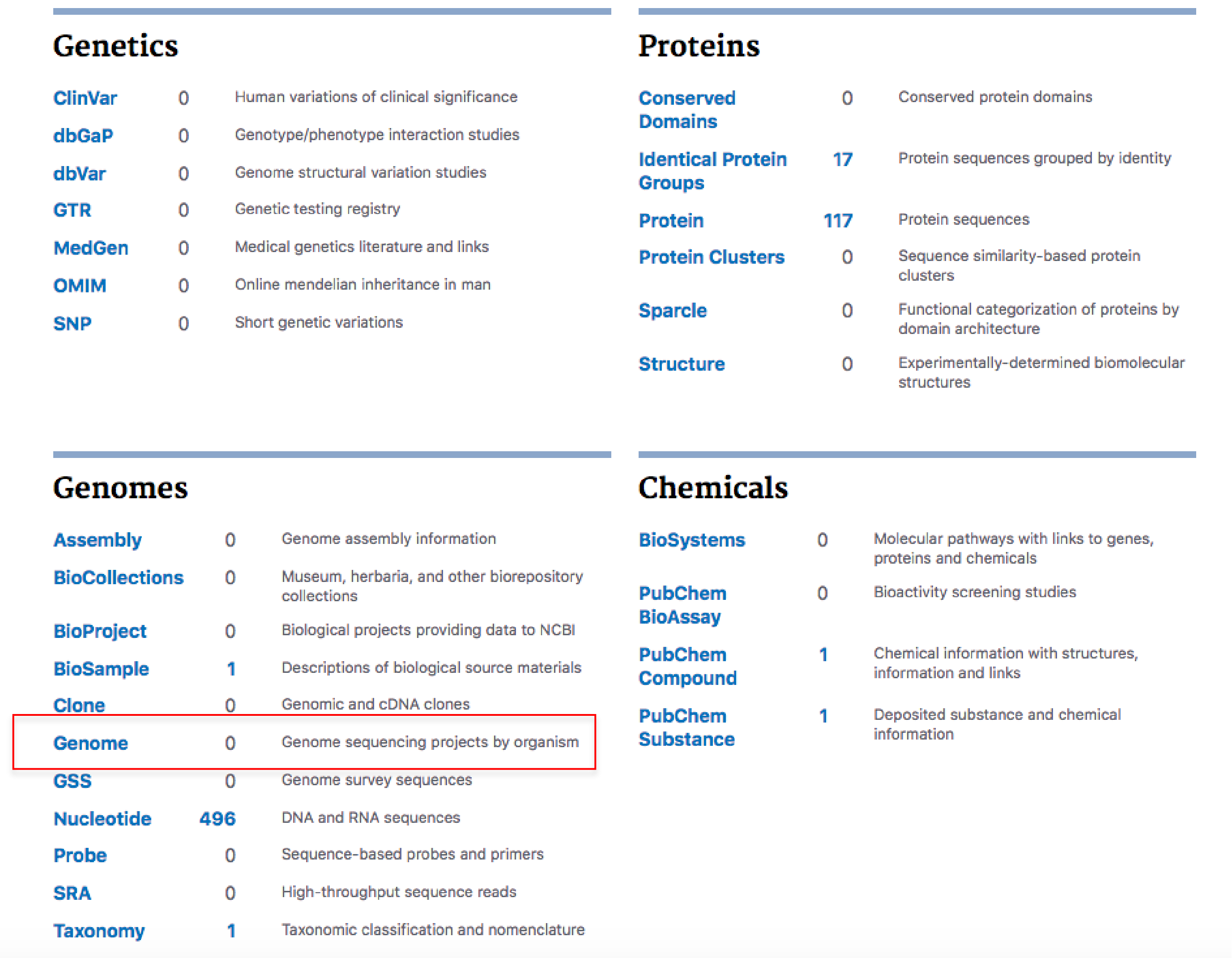
Una de las estrategias más viables es con el **desarrollo de procesos biotecnológicos** basados en el potencial genético de los frutales nativos.

Pues, éstos contienen una **mina de genes** que no han sido explotado hasta el momento.

Existen muchos vacíos de información genética en frutales nativos

Bactris gasipaes
“pijuayo”

Sotero y García, 2002
Vitamina A: 867.7 UI



Genetics

ClinVar	0	Human variations of clinical significance
dbGaP	0	Genotype/phenotype interaction studies
dbVar	0	Genome structural variation studies
GTR	0	Genetic testing registry
MedGen	0	Medical genetics literature and links
OMIM	0	Online mendelian inheritance in man
SNP	0	Short genetic variations

Proteins

Conserved Domains	0	Conserved protein domains
Identical Protein Groups	17	Protein sequences grouped by identity
Protein	117	Protein sequences
Protein Clusters	0	Sequence similarity-based protein clusters
Sparcle	0	Functional categorization of proteins by domain architecture
Structure	0	Experimentally-determined biomolecular structures

Genomes

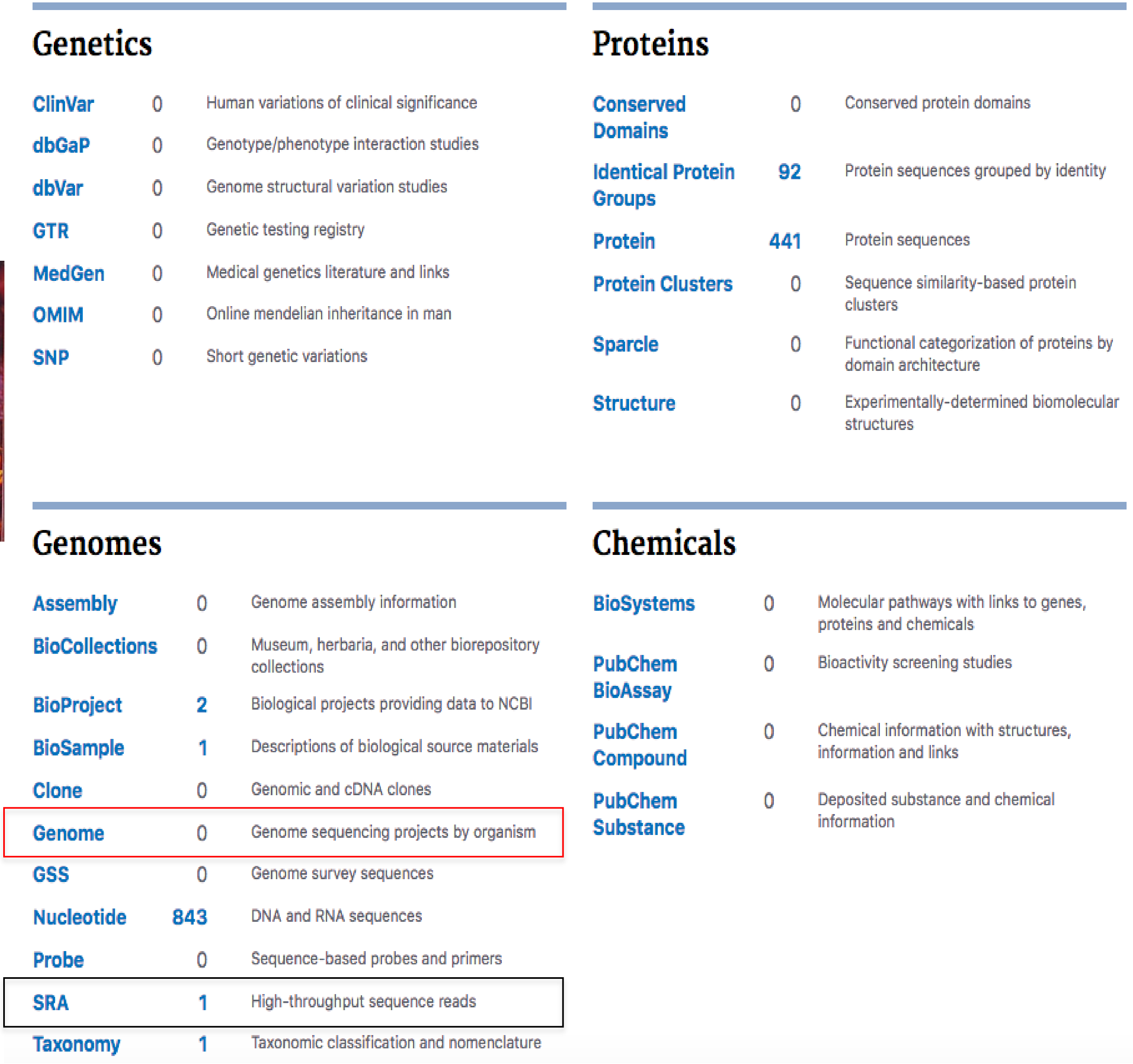
Assembly	0	Genome assembly information
BioCollections	0	Museum, herbaria, and other biorepository collections
BioProject	0	Biological projects providing data to NCBI
BioSample	1	Descriptions of biological source materials
Clone	0	Genomic and cDNA clones
Genome	0	Genome sequencing projects by organism
GSS	0	Genome survey sequences
Nucleotide	496	DNA and RNA sequences
Probe	0	Sequence-based probes and primers
SRA	0	High-throughput sequence reads
Taxonomy	1	Taxonomic classification and nomenclature

Chemicals

BioSystems	0	Molecular pathways with links to genes, proteins and chemicals
PubChem BioAssay	0	Bioactivity screening studies
PubChem Compound	1	Chemical information with structures, information and links
PubChem Substance	1	Deposited substance and chemical information

https://www.ncbi.nlm.nih.gov/search/?term=Bactris+gasipaes

Mauritia flexuosa *“aguaje”*



Genetics

ClinVar	0	Human variations of clinical significance
dbGaP	0	Genotype/phenotype interaction studies
dbVar	0	Genome structural variation studies
GTR	0	Genetic testing registry
MedGen	0	Medical genetics literature and links
OMIM	0	Online mendelian inheritance in man
SNP	0	Short genetic variations

Proteins

Conserved Domains	0	Conserved protein domains
Identical Protein Groups	92	Protein sequences grouped by identity
Protein	441	Protein sequences
Protein Clusters	0	Sequence similarity-based protein clusters
Sparcle	0	Functional categorization of proteins by domain architecture
Structure	0	Experimentally-determined biomolecular structures

Genomes

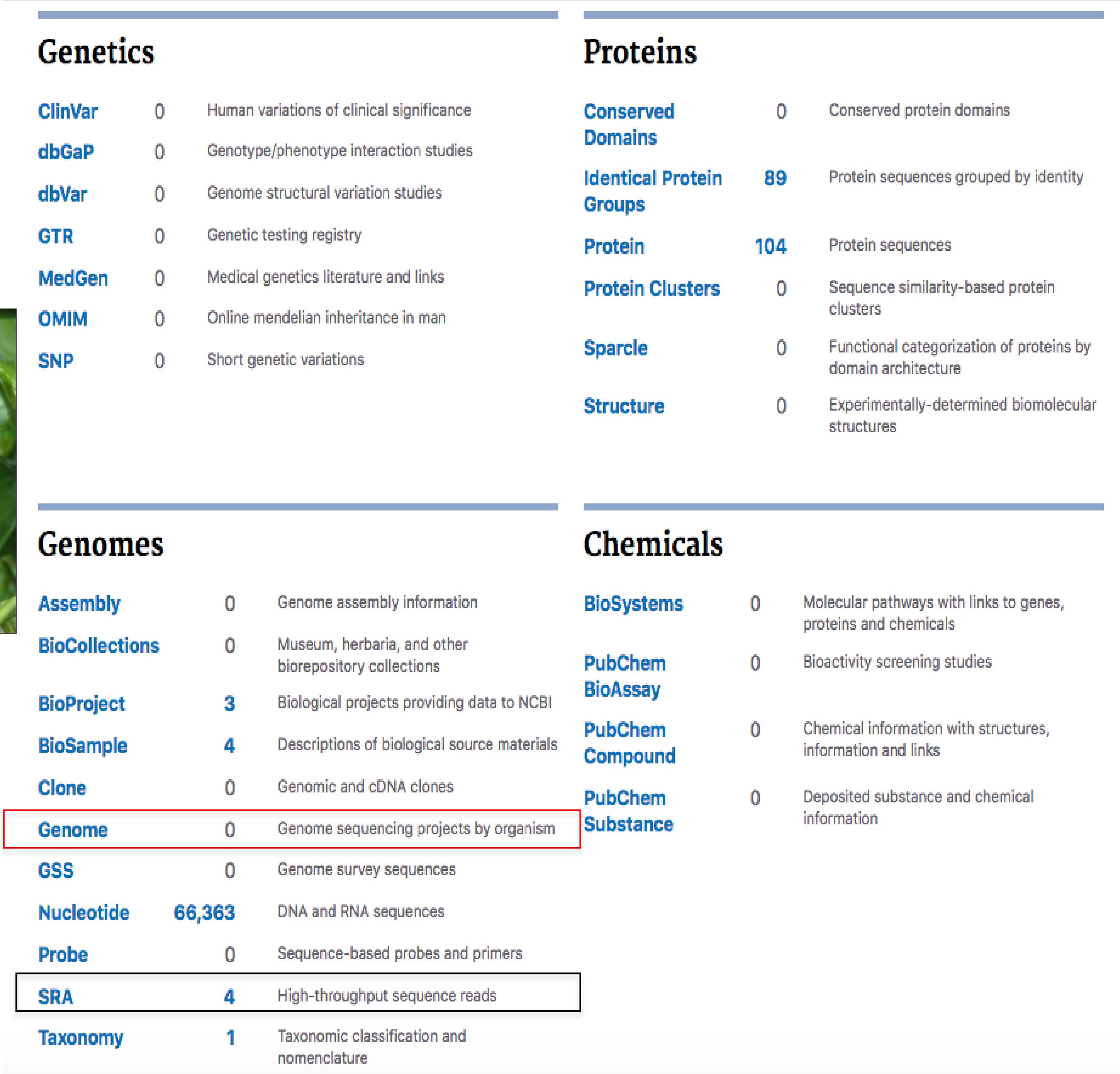
Assembly	0	Genome assembly information
BioCollections	0	Museum, herbaria, and other biorepository collections
BioProject	2	Biological projects providing data to NCBI
BioSample	1	Descriptions of biological source materials
Clone	0	Genomic and cDNA clones
Genome	0	Genome sequencing projects by organism
GSS	0	Genome survey sequences
Nucleotide	843	DNA and RNA sequences
Probe	0	Sequence-based probes and primers
SRA	1	High-throughput sequence reads
Taxonomy	1	Taxonomic classification and nomenclature

Chemicals

BioSystems	0	Molecular pathways with links to genes, proteins and chemicals
PubChem BioAssay	0	Bioactivity screening studies
PubChem Compound	0	Chemical information with structures, information and links
PubChem Substance	0	Deposited substance and chemical information

https://www.ncbi.nlm.nih.gov/search/?term=Mauritia+flexuosa

Plukenetia volubilis “sacha-inchi”



Genetics

ClinVar	0	Human variations of clinical significance
dbGaP	0	Genotype/phenotype interaction studies
dbVar	0	Genome structural variation studies
GTR	0	Genetic testing registry
MedGen	0	Medical genetics literature and links
OMIM	0	Online mendelian inheritance in man
SNP	0	Short genetic variations

Proteins

Conserved Domains	0	Conserved protein domains
Identical Protein Groups	89	Protein sequences grouped by identity
Protein	104	Protein sequences
Protein Clusters	0	Sequence similarity-based protein clusters
Sparcle	0	Functional categorization of proteins by domain architecture
Structure	0	Experimentally-determined biomolecular structures

Genomes

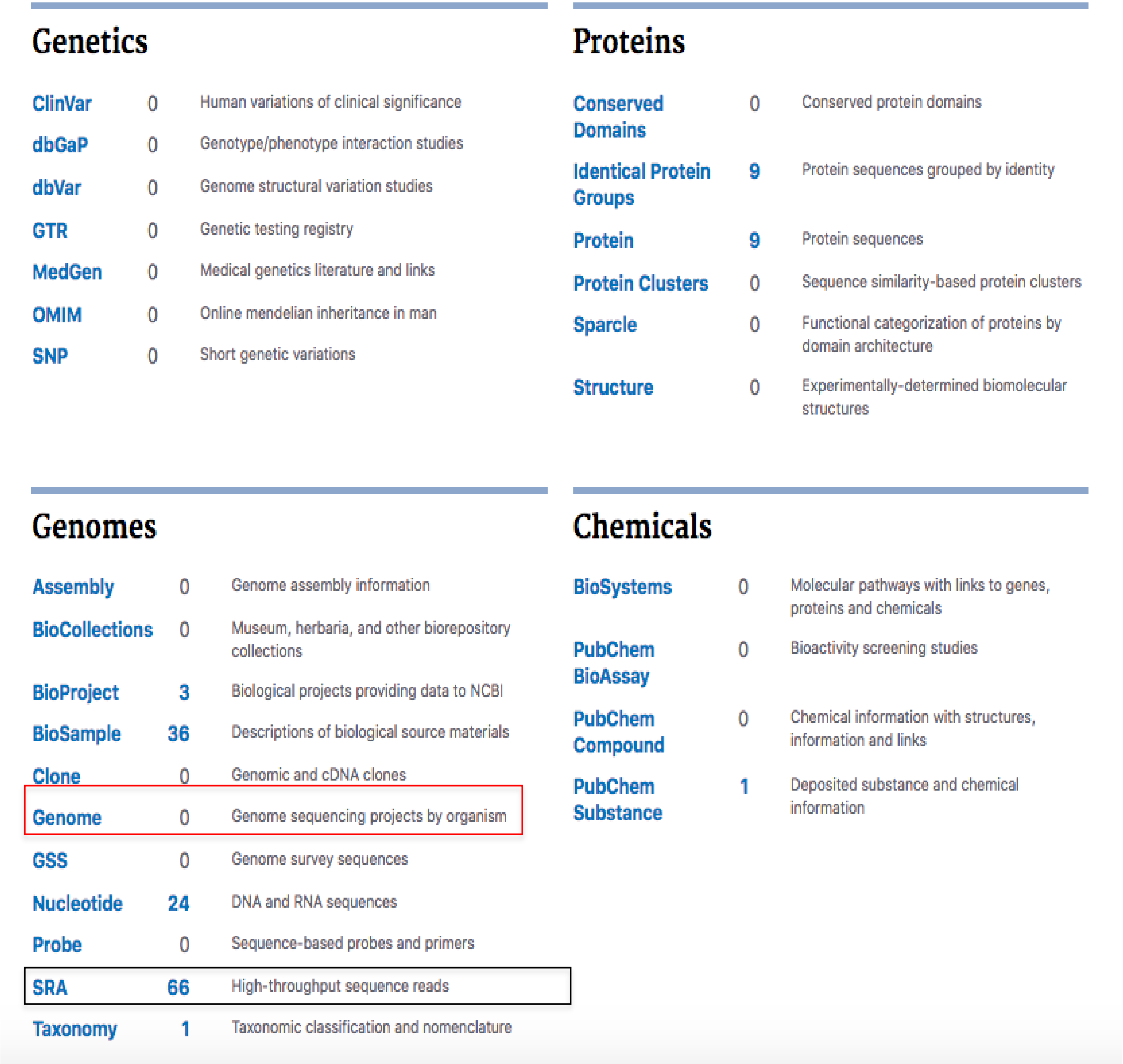
Assembly	0	Genome assembly information
BioCollections	0	Museum, herbaria, and other biorepository collections
BioProject	3	Biological projects providing data to NCBI
BioSample	4	Descriptions of biological source materials
Clone	0	Genomic and cDNA clones
Genome	0	Genome sequencing projects by organism
GSS	0	Genome survey sequences
Nucleotide	66,363	DNA and RNA sequences
Probe	0	Sequence-based probes and primers
SRA	4	High-throughput sequence reads
Taxonomy	1	Taxonomic classification and nomenclature

Chemicals

BioSystems	0	Molecular pathways with links to genes, proteins and chemicals
PubChem BioAssay	0	Bioactivity screening studies
PubChem Compound	0	Chemical information with structures, information and links
PubChem Substance	0	Deposited substance and chemical information

https://www.ncbi.nlm.nih.gov/search/?term=Plukenetia+volubilis

***Myrciaria dubia* “camu-camu”**



Genetics

ClinVar	0	Human variations of clinical significance
dbGaP	0	Genotype/phenotype interaction studies
dbVar	0	Genome structural variation studies
GTR	0	Genetic testing registry
MedGen	0	Medical genetics literature and links
OMIM	0	Online mendelian inheritance in man
SNP	0	Short genetic variations

Proteins

Conserved Domains	0	Conserved protein domains
Identical Protein Groups	9	Protein sequences grouped by identity
Protein	9	Protein sequences
Protein Clusters	0	Sequence similarity-based protein clusters
Sparcle	0	Functional categorization of proteins by domain architecture
Structure	0	Experimentally-determined biomolecular structures

Genomes

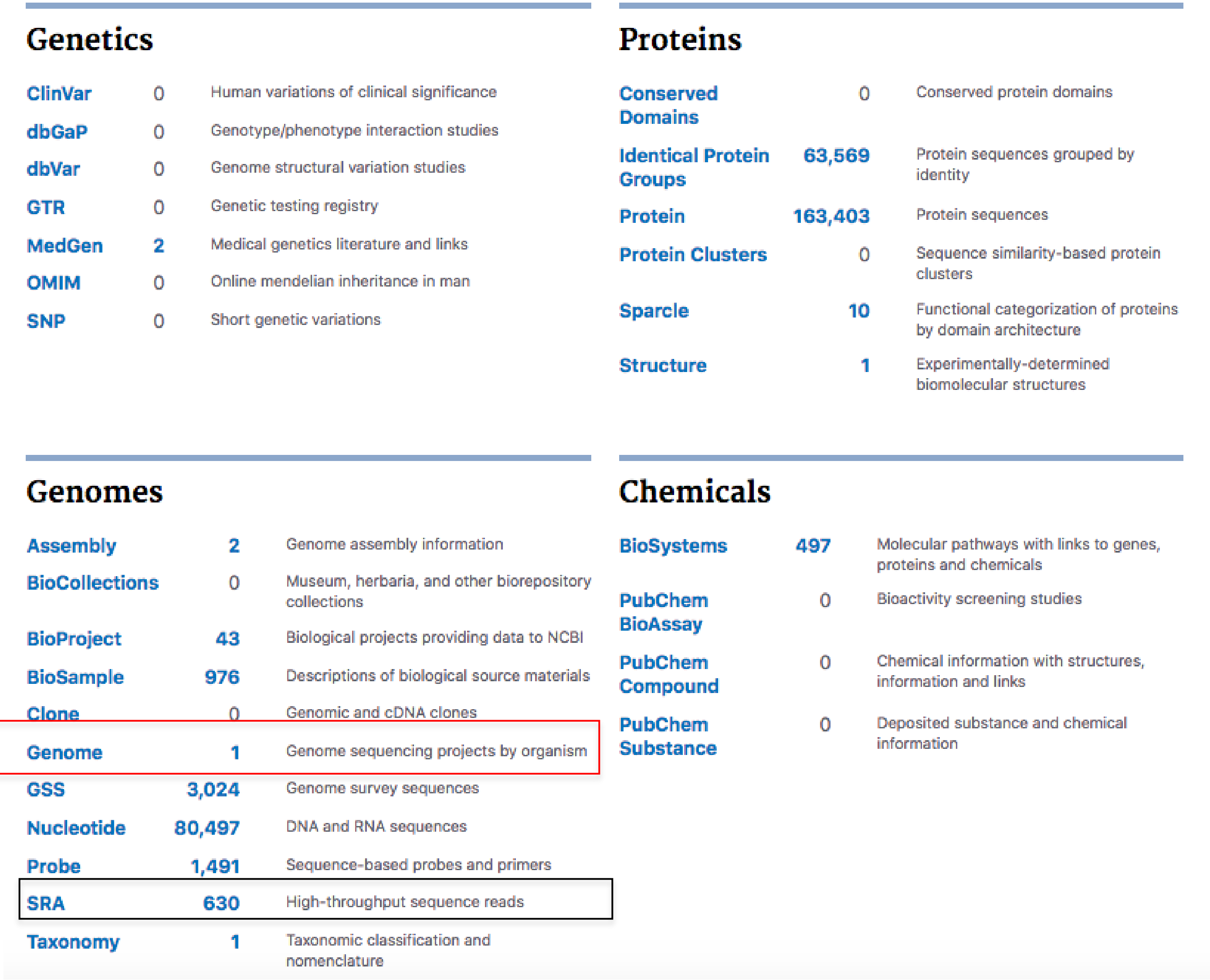
Assembly	0	Genome assembly information
BioCollections	0	Museum, herbaria, and other biorepository collections
BioProject	3	Biological projects providing data to NCBI
BioSample	36	Descriptions of biological source materials
Clone	0	Genomic and cDNA clones
Genome	0	Genome sequencing projects by organism
GSS	0	Genome survey sequences
Nucleotide	24	DNA and RNA sequences
Probe	0	Sequence-based probes and primers
SRA	66	High-throughput sequence reads
Taxonomy	1	Taxonomic classification and nomenclature

Chemicals

BioSystems	0	Molecular pathways with links to genes, proteins and chemicals
PubChem BioAssay	0	Bioactivity screening studies
PubChem Compound	0	Chemical information with structures, information and links
PubChem Substance	1	Deposited substance and chemical information

Theobroma cacao "cacao"

Hay diferencias marcadas en los genomas de los cultivares **"Criollo"** (2011) y **Matina 1-6** (2013)



Genetics

ClinVar	0	Human variations of clinical significance
dbGaP	0	Genotype/phenotype interaction studies
dbVar	0	Genome structural variation studies
GTR	0	Genetic testing registry
MedGen	2	Medical genetics literature and links
OMIM	0	Online mendelian inheritance in man
SNP	0	Short genetic variations

Proteins

Conserved Domains	0	Conserved protein domains
Identical Protein Groups	63,569	Protein sequences grouped by identity
Protein	163,403	Protein sequences
Protein Clusters	0	Sequence similarity-based protein clusters
Sparcle	10	Functional categorization of proteins by domain architecture
Structure	1	Experimentally-determined biomolecular structures

Genomes

Assembly	2	Genome assembly information
BioCollections	0	Museum, herbaria, and other biorepository collections
BioProject	43	Biological projects providing data to NCBI
BioSample	976	Descriptions of biological source materials
Clone	0	Genomic and cDNA clones
Genome	1	Genome sequencing projects by organism
GSS	3,024	Genome survey sequences
Nucleotide	80,497	DNA and RNA sequences
Probe	1,491	Sequence-based probes and primers
SRA	630	High-throughput sequence reads
Taxonomy	1	Taxonomic classification and nomenclature

Chemicals

BioSystems	497	Molecular pathways with links to genes, proteins and chemicals
PubChem BioAssay	0	Bioactivity screening studies
PubChem Compound	0	Chemical information with structures, information and links
PubChem Substance	0	Deposited substance and chemical information

Necesitamos generar más información científica de los frutales nativos

Desarrollando los estudios “ómicos”:

- Genómicos
- Transcriptómicos
- Proteómicos
- Metabolómicos
- Fenómicos (la suma total de sus rasgos fenotípicos)

como base para la mejora genética moderna de

Actualmente contamos con tecnología de punta para algunos estudios "ómicos"

Características:
Produce de 16 a 120 Giga bases de información genética
Para analizar GENOMAS y TRANSCRIPTOMAS de microorganismos, plantas, animales, etc

Secuenciador de última generación

NextSeq 550 - Illumina

También contamos con tecnología para el mejoramiento genético moderno de frutales nativos

Sistema de Biobalística
PDS-1000/He

Frutales Nativos

Mejoramiento Genético

INTRAGÉNESIS

EDICIÓN DE GENOMAS

- ↑ Calidad nutracéutica
- ↑ Productividad
- ↑ Resistencia a plagas
- ↑ Resistencia a sequías

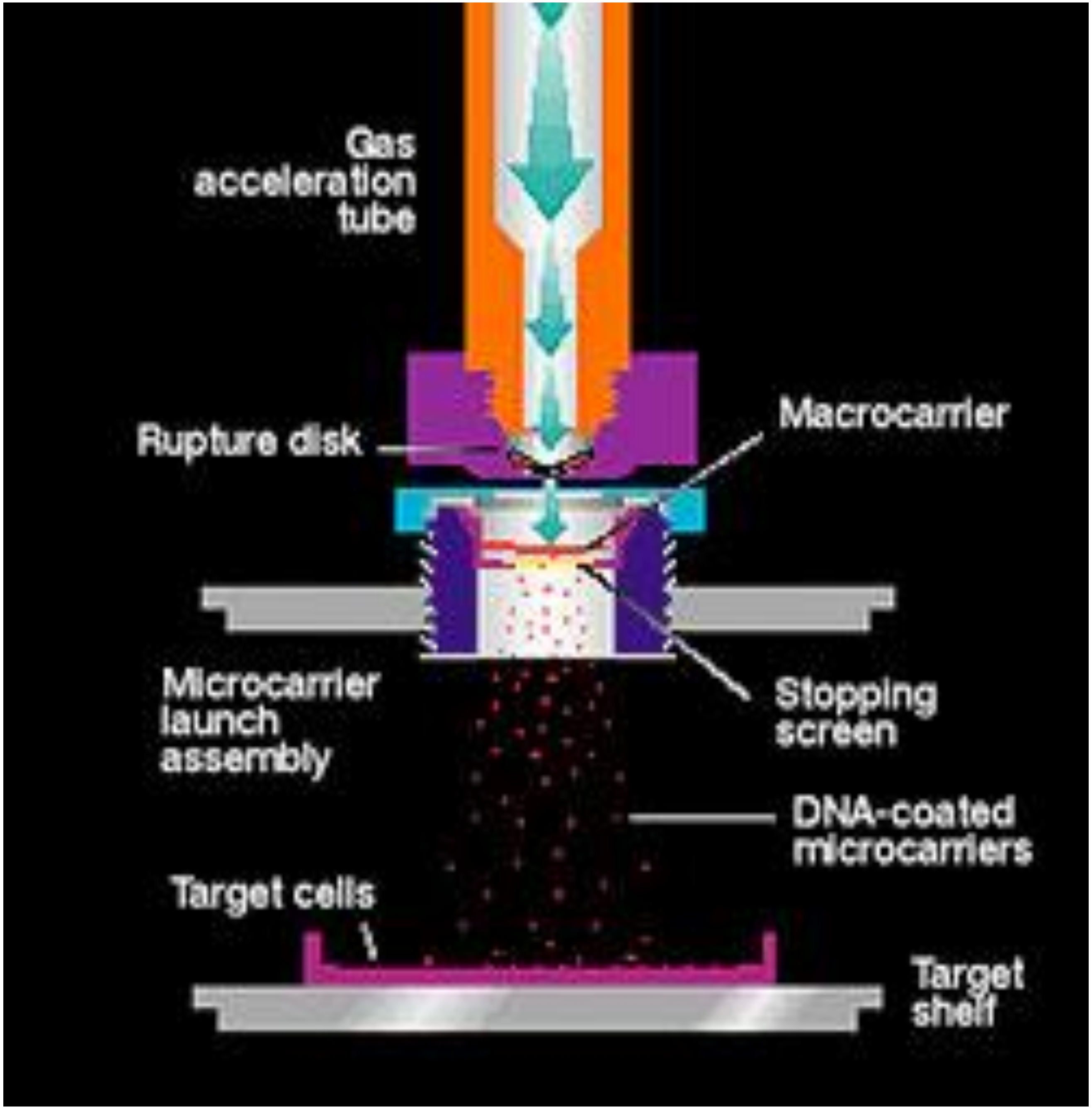
Resistencia a enfermedades y plagas

- ❑En cualquier método de mejoramiento, el **factor más importante** para incrementar la producción es la resistencia a las enfermedades y plagas, ya que la mayoría de las plantas son atacadas por patógenos e insectos que reducen o eliminan totalmente las cosechas.
- ❑En muchos casos resulta incosteable o contraproducente combatirlas por métodos químicos o biológicos.
- ❑Por lo tanto, el mejor método de control de enfermedades y plagas es el genético, es decir, desarrollar variedades resistentes o tolerantes a patógenos e insectos.

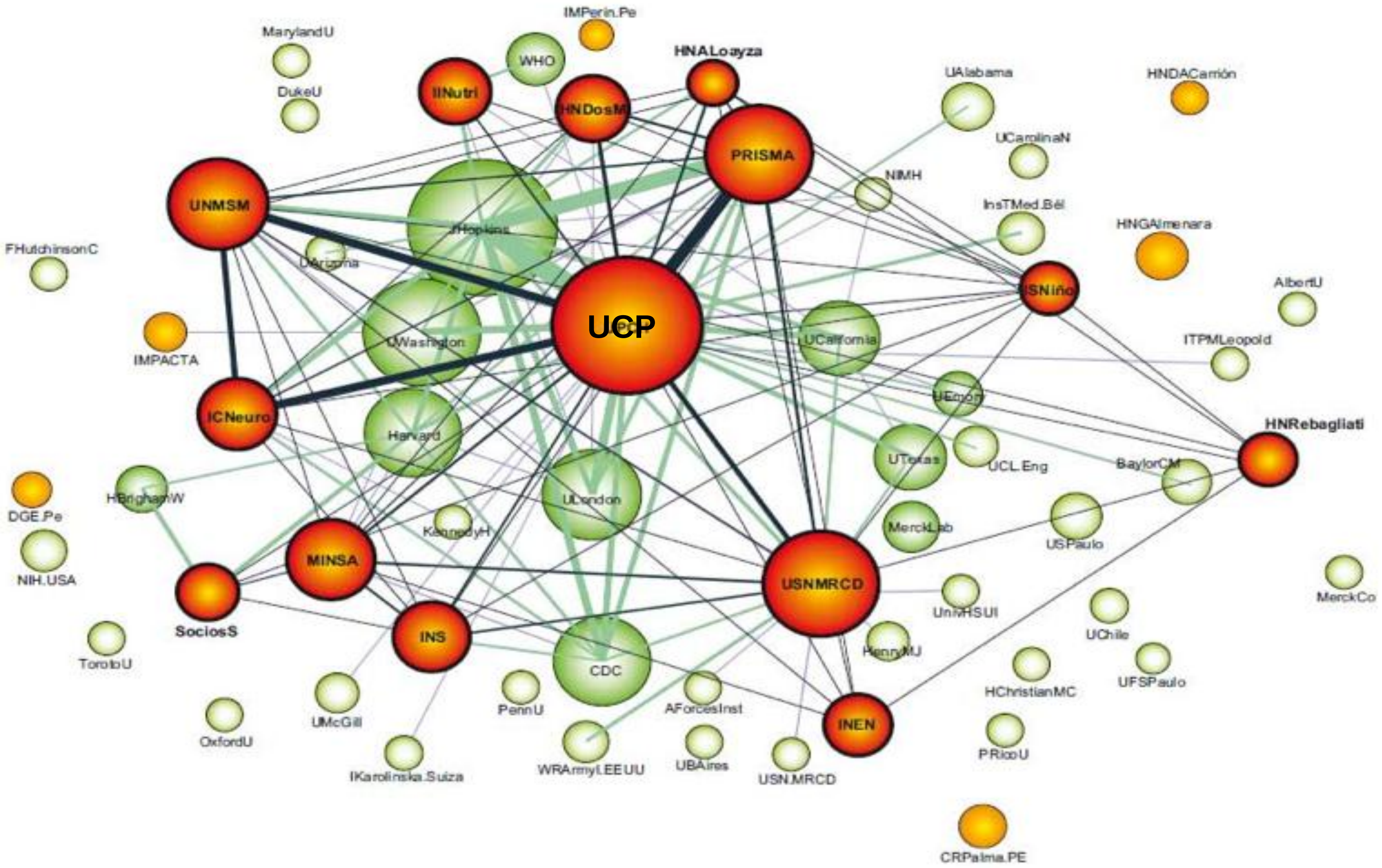
Pistola de Helio

- Con el uso de **plataformas biotecnológicas moleculares** que ofrecen la ventaja de disminuir el tiempo para el mejoramiento genético, permitiendo la producción de materiales sanos, sobresalientes en una o varias características, y al mismo tiempo conservando las bondades de la variedad.

- **biobalística** es uno de los métodos directos de transformación.
- Se basa en disparar hacia el núcleo de las células a transformar, con alta aceleración, pequeños proyectiles con ADN adherido en su superficie, permitiendo así la incorporación de ADN foráneo al ADN de la célula.



❑Fortalecer la **red de colaboración** entre instituciones públicas y privadas.



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CATOLICA
DE VALPARAISO

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INSTITUTO DEL MAR DEL PERU
CIENCIA Y TECNOLOGIA

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The Field Museum

Pritzker Laboratory for Molecular Systematics and Evolution

AGRADECIMIENTO

Convenio 295-ECL-INNOVATEPERU-2017

Convenio 018-2018-FONDECYT/BM


Área de transferencia

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