

Empowering Agriculture, Aquaculture, Biodiversity Conservation and Genetic Innovation with Advanced Data Processing



Challenge

- Ensembl^[1] is a renowned genome browser, pivotal for comparative genomics, evolution, sequence variation, and transcriptional regulation across species.
- Recent global scientific strides, spanning pangenomes to eukaryotic biodiversity, require Ensembl's rapid growth in handling the surge of sequenced genomes.
- This surge in bioinformatics data (size, density, numbers), fuelled by the explosion of next-generation sequencing, demands improved methods for users to efficiently explore and utilize pertinent genomic data sources.
- Thus, better infrastructures, interfaces, and data management processes are required for users to effectively explore available data sources and find those relevant to their research and development activities.

Technology

Our team is responsible for the development of Ensembl services, including core infrastructure, applications, and regulatory components. Additionally, we oversee the Track Hub Registry, which serves as a centralized repository for the registration and discovery of publicly accessible track data hubs. After receiving genomic datasets, we validate and process them, offering superior annotations and providing the complete regulatory framework. By conducting comprehensive whole genome analyses, we reveal genomic functions. After meticulously processing the data, we exert diligent efforts to organize it into data cohorts, which are then presented to the community through our tailored data portals (e.g. Darwin Tree Of Life^[2]) in an efficient and swift manner (e.g. knowledge graph). Our efforts extend to creating valuable data resources to support animal agri/aqua-culture and biodiversity genomics. Leveraging our expertise, we also harness Linked Satellite Data to gauge the impact of climate change, seamlessly connecting the present and future, while actively supporting biodiversity initiatives.

Intellectual Property

- Know-how based
- Copyright

Commercial Opportunity

We are looking to engage more extensively with external scientific academic and industrial collaborators. We would welcome new collaborations in all areas and are particularly interested in animal agri/aquaculture FAIR data coordination, pangenomics, cell atlases, innovative data presentation, and data management and presentation of biodiversity initiatives.

Seeking:

- Collaborations

Internal EMBLEM Reference

2024-007

Key Inventors

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Applications

- **Pharmaceutical Industry:**
 - Utilizing genomic data for drug discovery and precise target identification.
- **AgriTech-AquaTech:**
 - Improving breeding programs and livestock health through advanced genomic insights.
- **Biodiversity Conservation:**
 - Analyzing genetic diversity to support conservation initiatives.
 - Integrating genomic data for more accurate impact assessments.

- **Climatology and Ecology:**
 - Harnessing Linked Satellite Data for modeling climate change impact.
- **Research:**
 - Development of research infrastructure
 - Data validation, processing and visualization with maps and knowledge graphs
- **Biotechnology:**
 - Developing data analytics and visualization tools for genomics.

References

- [Ensembl](#)
- [Darwin Tree of Life](#)
- [The Biodiversity Portal](#)
- [The Track Hub Registry](#)
- [Functional Annotation of ANimal Genomes \(FAANG\) Project](#)

Benefits

- Swift data processing
- Resource enrichment
- Innovation Facilitation
- Precision and Accuracy
- Community Empowerment
- Reliable Data

Further Reading

[1] <https://doi.org/10.1093/nar/gkac958>

[2] <https://doi.org/10.1073/pnas.211564211>

Keywords

- # Agritech
- # Data management
- # Data visualisation
- # Data presentation
- # Animal science
- # Biodiversity
- # Data coordination cancell
- # Data standardisation
- # Data access
- # Genomics
- # Animal genetics

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