OECD Extended Advisory Group for Molecular Screening and Toxicogenomics (EAGMST)

Guidance Document for Consistent Reporting of 'Omics Data From Various Sources

Transcriptomics Reporting Framework (TRF)

EAGMST Meeting, Paris FR
June 29th, 2018

Disclaimer

- *The views expressed in this presentation are those of the author(s) and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency.*

Project Description

To develop frameworks for the standardisation of reporting of 'omics data generation and analysis, to ensure that all of the information required to understand, interpret and reproduce an 'omics experiment and its results are available.

Purpose: to ensure that sufficient information is available to enable an evaluation of the quality of the experimental data and interpretation, and support reproducibility.

NOT to stipulate the methods of data analysis or interpretation….**Rather**, provide guidance on reporting of information that fosters transparency and reproducibility.

Project Name	Project Lead
Metabolomics Reporting Framework (MRF)	Mark Viant (U. Birmingham, UK)
Transcriptomics Reporting Framework (TRF)	Joshua Harrill (USEPA) Carole Yauk (Health Canada)
Reference Baseline Analysis (RBA)	Tim Gant (PHE, UK)

TRF Objective, Working Group Charge & Scope

OBJECTIVE: Development of a Transcriptomics Reporting Framework (TRF) for processing of 'omics data that will facilitate acceptance of transcriptomics studies in a regulatory setting.

WORKING GROUP CHARGE: The TRF working group is tasked with determining what information should be captured by the TRF to support interpretation and computational reproducibility of 'omics experiments by members of the regulatory community. Such information will also be of value to researchers in academia and industry.

SCOPE: The transcriptomics reporting framework (TRF) is a tool for documenting the details of laboratory-based toxicology studies that utilize a transcriptomics technology: i.e. an assay that measures the abundance of many transcripts simultaneously and that provides highly multiplexed outputs. The TRF is appropriate for use in documenting experiments involving the use of either *in vivo* or *in vitro* laboratory models. The information captured by the TRF should be of sufficient detail for other researchers to replicate all aspects of the transcriptomics experiment including administration of chemicals, sample processing, raw data collection and computational methods used to generate processed data. The TRF is designed to be coupled with downstream analysis reporting modules (DARMs) that detail the steps and resources necessary to reproduce a computational analysis of the processed data. Specific DARMs are coupled to the TRF based on the researcher's specific use case.

TRF Document, Major Topic Areas

EXPERIMENT:

- The experiment should be described in sufficient detail that would allow another researcher to replicate the experiment.
- Adapted from existing sources
- Information in this section is independent of ‘omics platform

PROCESSING AND ANALYSIS OF ‘OMICS DATA:

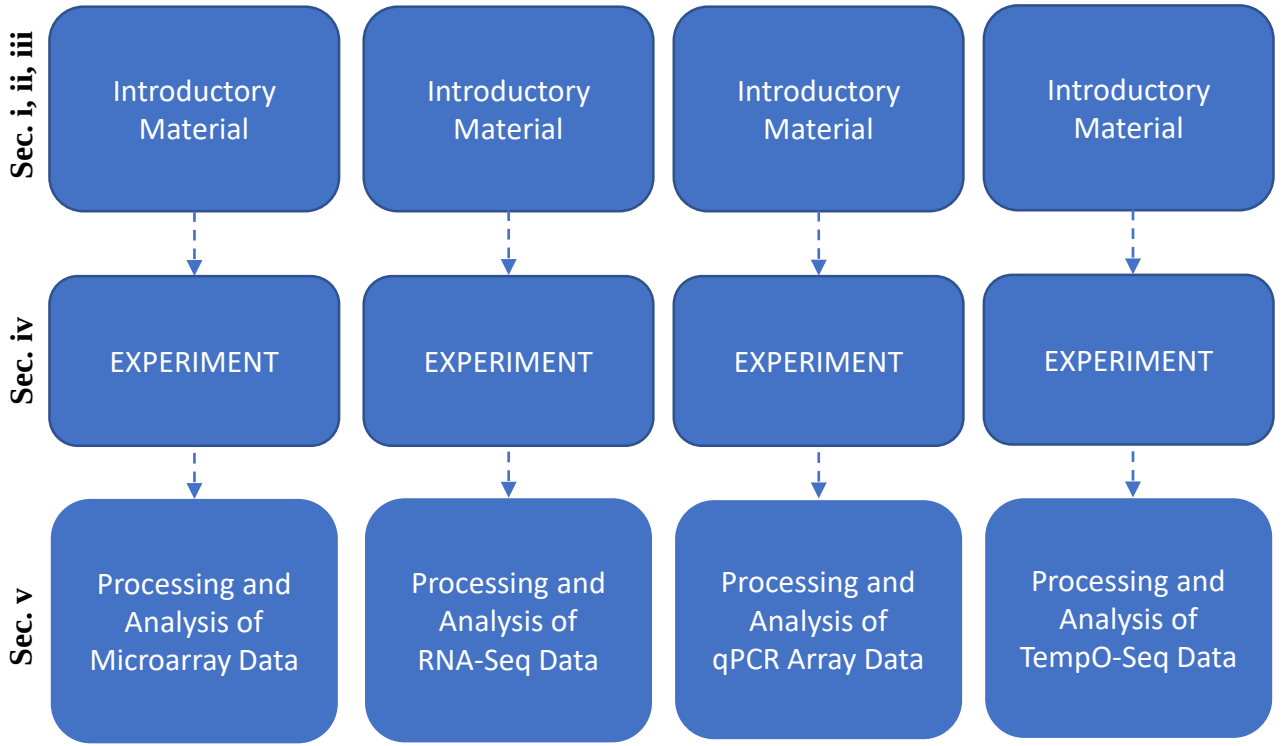
- The transcriptomics technology, sample processing procedures, methods used to collect raw data and methods used to generate processed data.
- Described in Gant et al. (2017).
- Information in this section is dependent on ‘omics platform

DOWNSTREAM ANALYSIS REPORTING MODULES [DARMs]

- Detail the steps and resources necessary to reproduce a computational analysis of the processed data.

TRF Document Structure, Options

- Several short, technology-specific documents
- Redundancy in sections i-iv across documents



Downstream Analysis Modules:

- Separate documents with reporting standards for more complex analyses
- To be mixed and matched with TRF based on use case.

PCA | Hierarchical Clustering | BMD | GSEA etc.,

Section Workgroups

Each workgroup will consist of the following:

Title	Identity	Roles
Section Leads	Experiment — Raffaella Corvi [JRC] Microarray — Vikrant Vijay [NCTR] RNA-Seq — Florian Caiment [Maastricht] q-PCR array — Jason O'Brien [ECCC] TempO-Seq — Scott Auerbach [NTP] DARM.1 [DEG] — Lyle Burgoon [ERDC]	Coordinate workgroup activities Maintain draft of section Manage timelines for deliverables
Workgroup Members (n = 2-3)	See Next Slide	Contribute text and content for sections
"Floating" Facilitators	Joshua Harrill [USEPA] Carole Yauk [Health Canada]	Ensure consistency and cross-talk with other workgroups. Monitor progress in accordance with project timeline Foster discussion.
OECD Secretariat	Magda Sachana	Project administration / OECD liaison

All members of the TRF workgroup will have the opportunity to comment on each section.

Project group leads (Harrill & Yauk) will integrate sections into the final document.

Progress To Date

Date	Milestone
February-April, 2018	Project leadership planning calls Drafting and circulation of TRF outline document
April, 2018	Kick-off teleconference with entire TRF working group • Solicitation of comment on TRF outline • Recruiting for section working groups • Addition of industry members
May, 2018	Second teleconference with entire TRF working group • Presentation of scoping statement • Follow-up on discussion points on document content / structure • Alignment of TRF with OECD Harmonized Templates (Alberto Martin, EFSA)
June, 2018	Kickoff TC for Experiment working group Kickoff TC for Microarray working group
July – Nov, 2018	Kickoff TC for DARM.1 Working Group Drafting of Experiment, Microarray and DARM.1 sections Monthly TC with each active working group.

Project Timeline

Date	Milestone
April, 2018	Kickoff teleconference / recruiting for workgroups
May – June, 2018	Begin work on Introduction, Experiment, Microarray and DARM.1 modules
June, 2018	OECD WPHA & EAGMST Meeting – Project update (presentation)
Dec, 2018	First drafts of Introduction, Experiment and Microarray sections due OECD Winter Meeting
June, 2019	Near Final Draft of Introduction, Experiment and Microarray sections Kickoff of Round Robin Case Study for Microarray First drafts of RNA-Seq, PCR array, TempO-Seq due OECD Spring Meeting
Dec, 2019	Final document(s) – project completion OECD Winter Meeting

Acknowledgements

- Leadership Team
  - Carole Yauk
  - Tim Gant
  - Magda Sachana

- OECD TRF Working Group Members

Questions?