



Djerba: Generating Clinical Genome Interpretation Reports for Cancer

Iain Bancarz, Felix Beaudry, Wen Tong, Lauren Toy, Alex Fortuna, Trevor Pugh.
Clinical Genome Interpretation, [Ontario Institute for Cancer Research](#), Toronto, ON, Canada.



Introduction: What is [Djerba](#)?

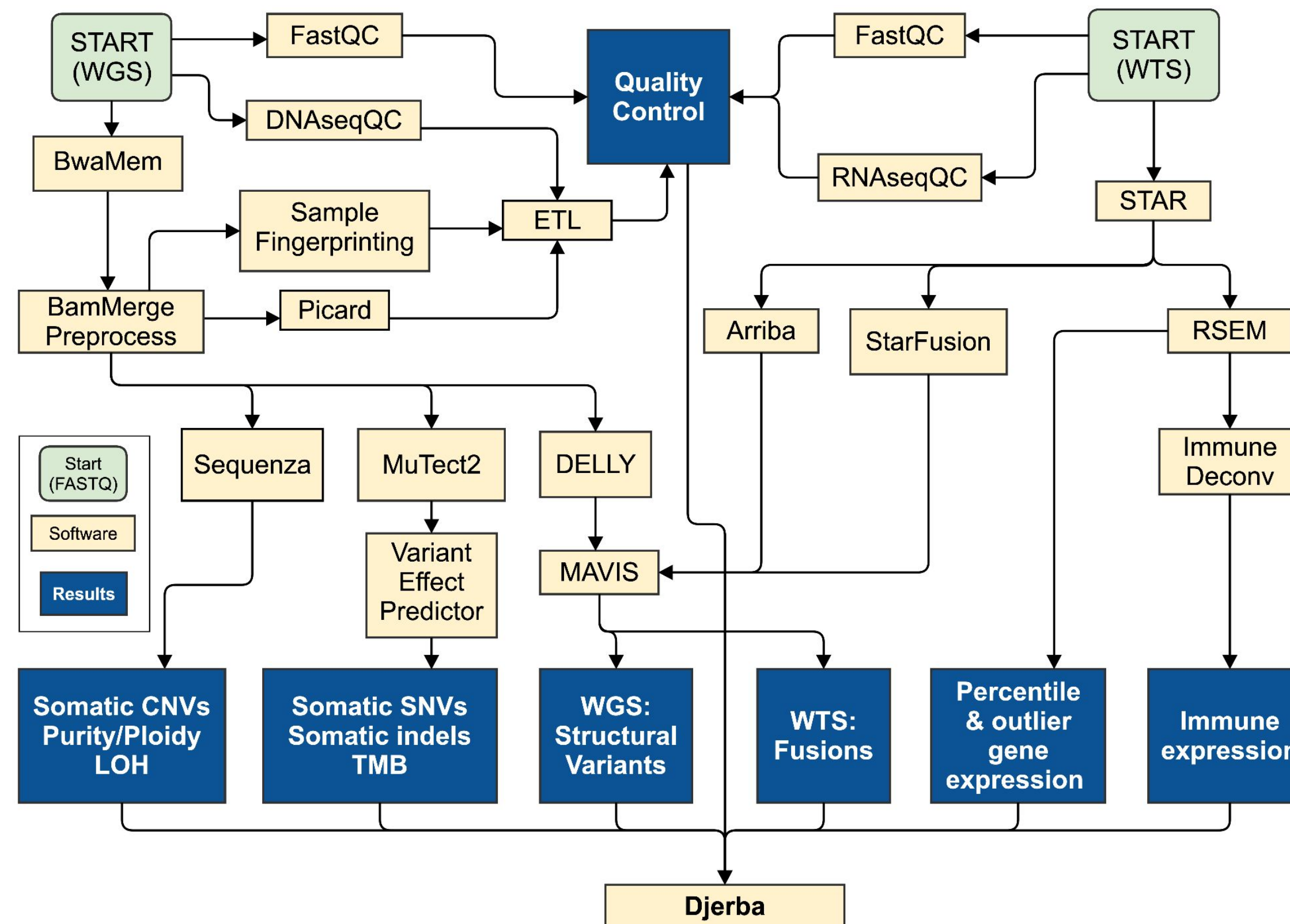
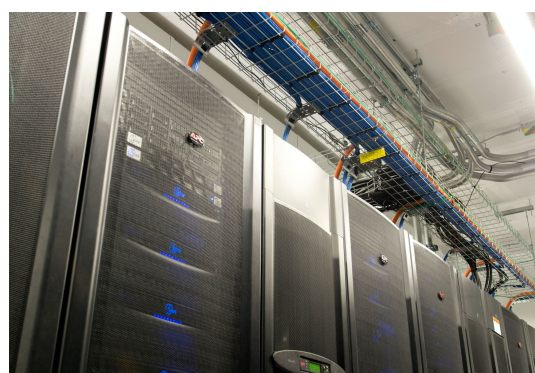
- A system to merge **genomic information** for a **cancer patient** into a **clinically actionable** report.
- Diverse set of inputs, with more under active development
- Named for a Mediterranean island, pronounced “jerba”.

How is it made?

- Main codebase in **Python**
- Data analysis and plotting in **R**
- HTML templating in [Mako](#)
- Archiving reports in [CouchDB](#)



Sequencing & Workflows



Clinical reporting begins with sequencing.

BCL files from tumour/normal Whole Genome Sequencing (WGS) and Whole Transcriptome Sequencing (WTS) are converted to FASTQ and input to the OICR clinical pipelines.

The pipelines are fully automated, implemented in [WDL](#) (Workflow Description Language) and run by the [Shesmu](#) and [Vidarr](#) systems developed at OICR.

Figure 1: Flowchart of WGS and WTS workflows and outputs at OICR.

Machine Readable (JSON)

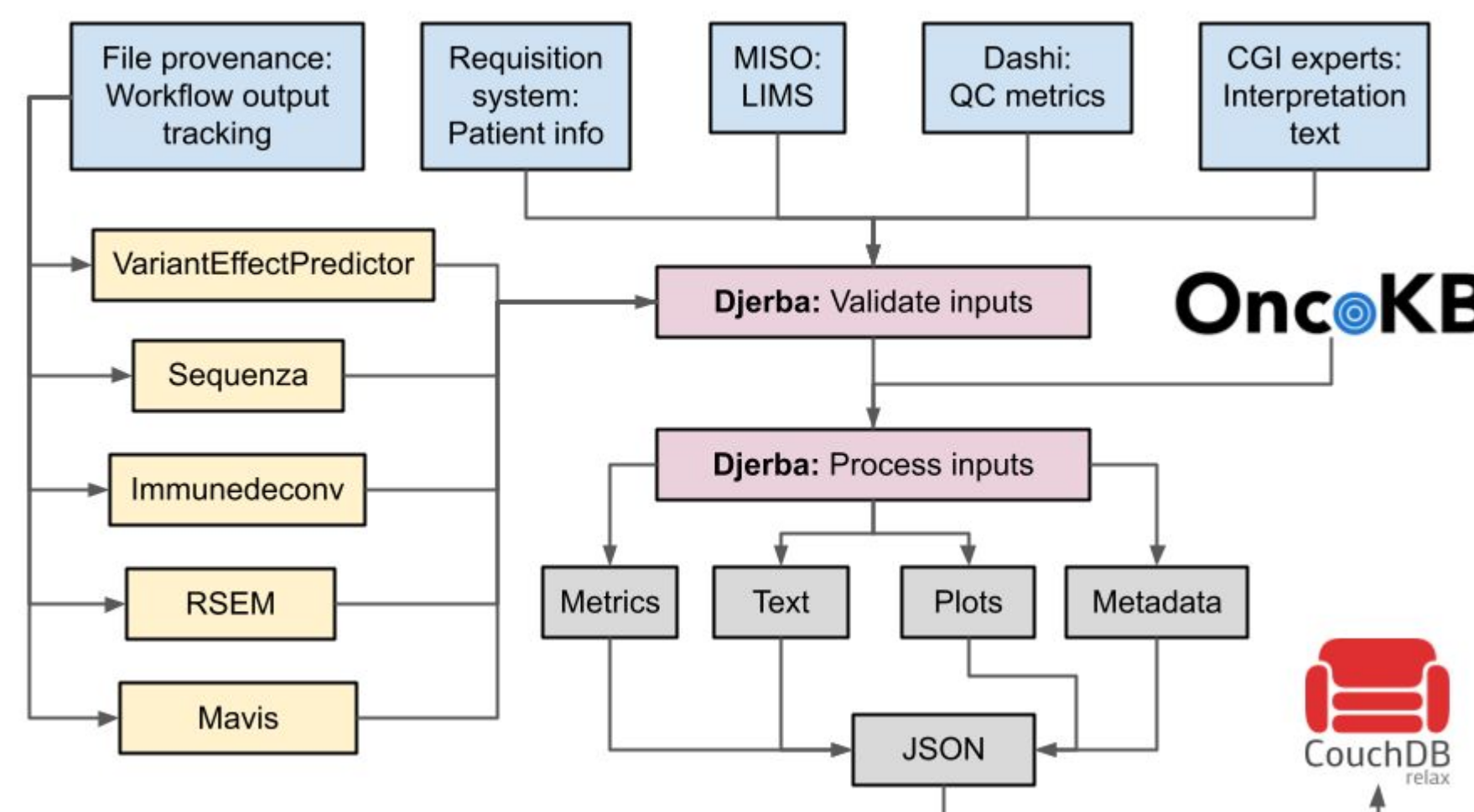
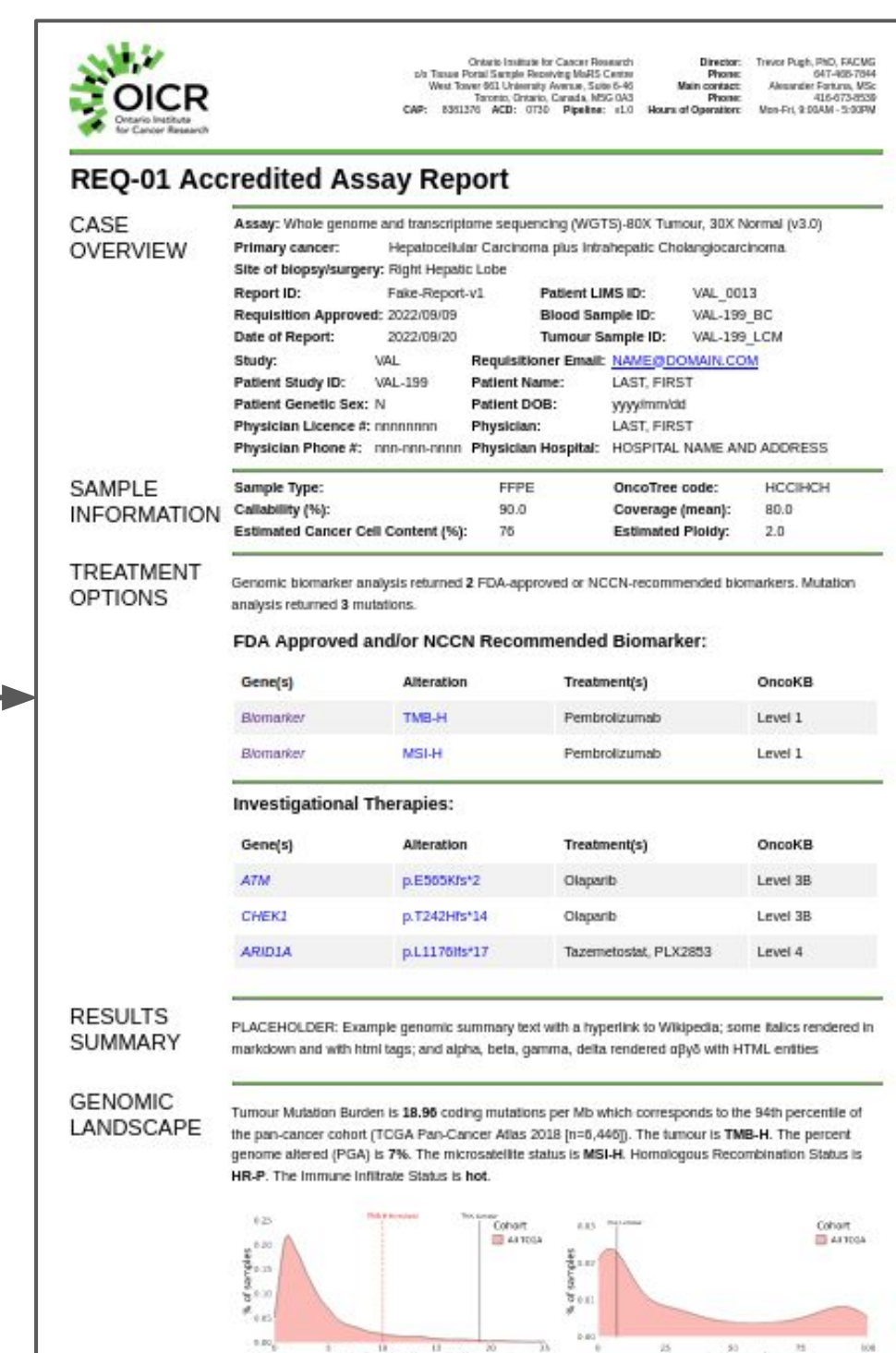
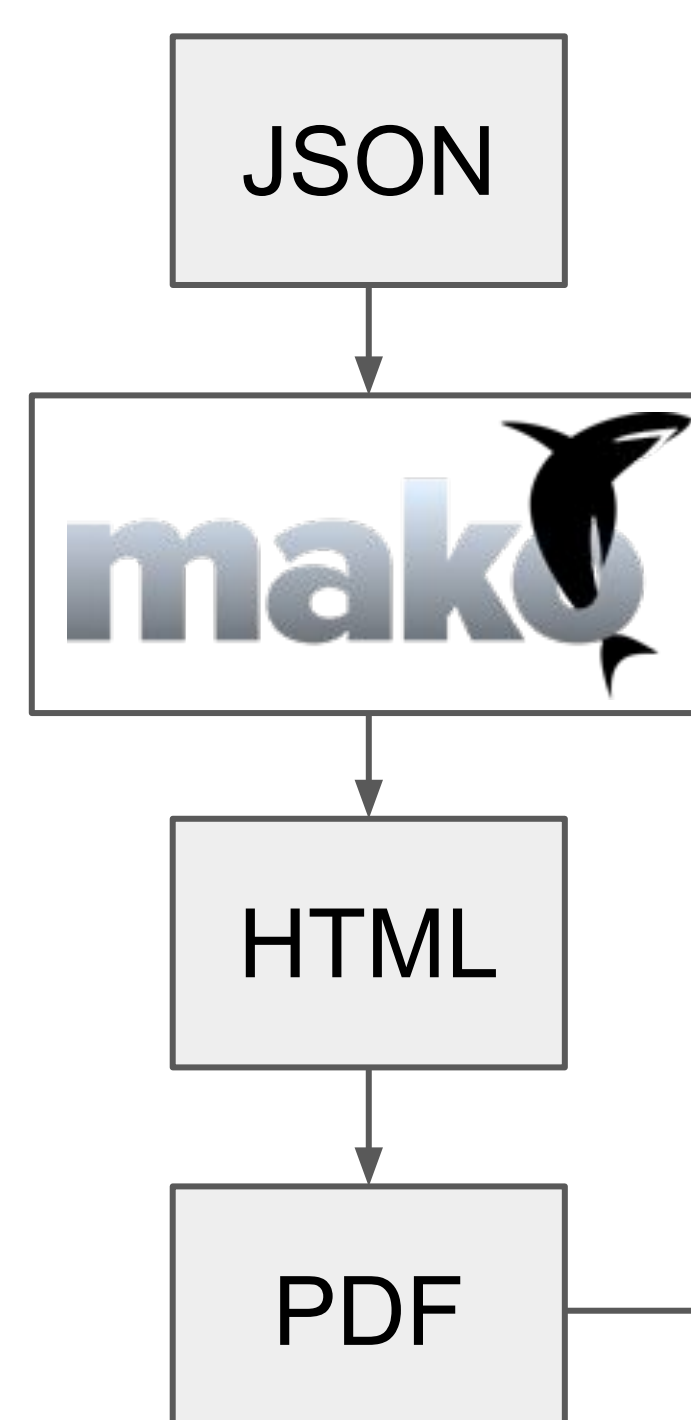


Figure 2: Workflow of the Djerba system to produce JSON from a range of inputs.

Djerba takes input from workflows, other OICR systems, and customized interpretation text; applies annotation from [OncoKB](#); generates metrics and plots; and outputs a self-contained [JSON](#) document.

The JSON is uploaded to a [CouchDB](#) database, and used to make the human-readable clinical report.

Human Readable (PDF)



The JSON data structure populates an HTML document using [Mako](#), a flexible and powerful templating system for Python. HTML is converted to PDF to produce the final clinical report document.

Summary

[Djerba](#) brings together a rich and diverse set of inputs to build clinically actionable reports.

Figure 3: Workflow of the Djerba system to produce PDF from JSON.