GULBENKIAN SCIENCE

PO21: Precision Oncology Course

Exercise: Running PanDrugs

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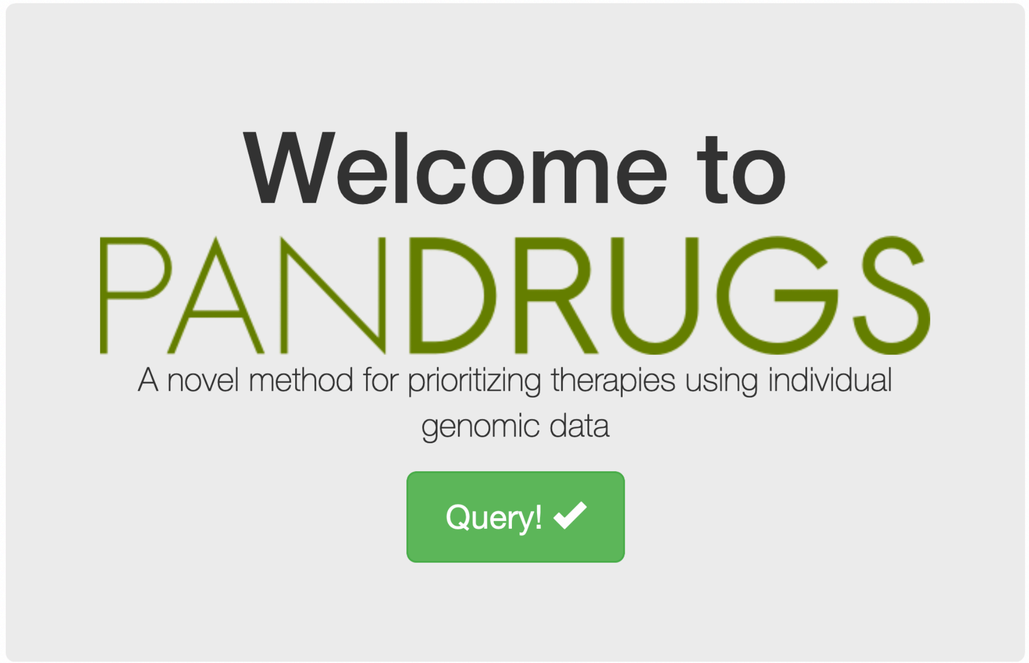
cnio stop cancer

www.pandrugs.org

@PanDrugs_CNIO



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PanDrugs is a web tool for **prioritizing cancer therapies** based on **individual genomics data**.

www.pandrugs.org

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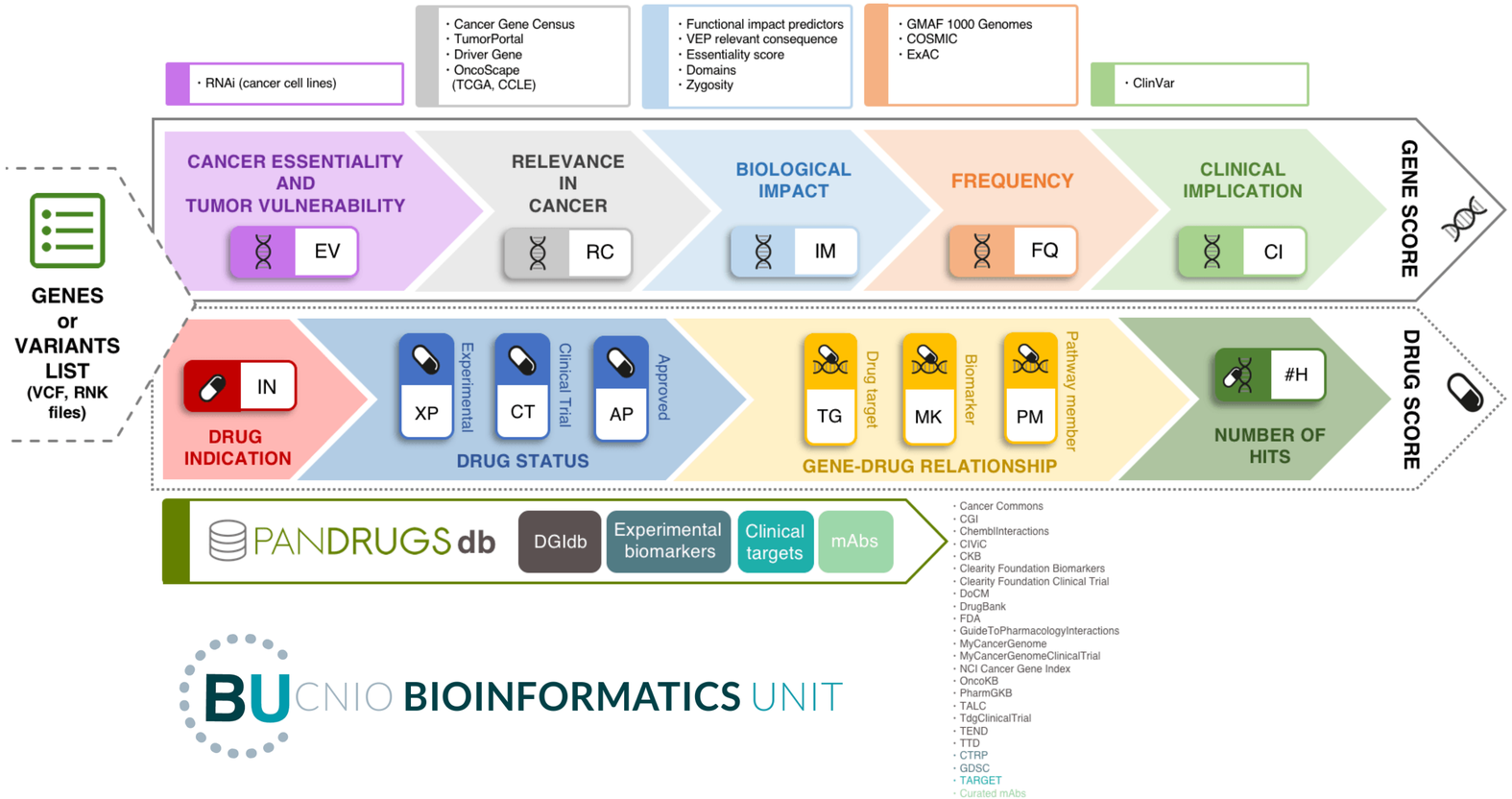

- **GScore** (0-1): Measures the **relevance of genetic variants in cancer**.
- **DScore** (0-1): Measures the **drug efficacy** against different targets.

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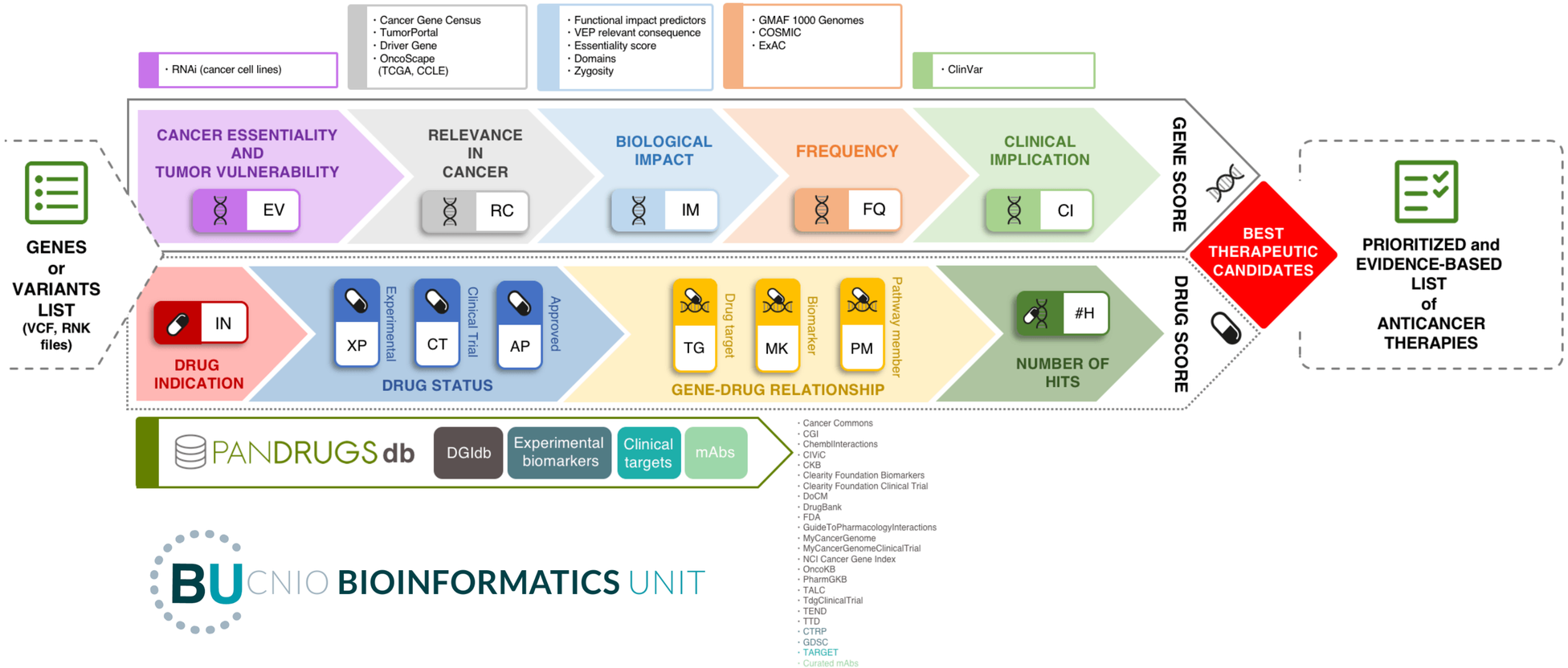


Based on these two scores, PanDrugs outputs a ranking of the **best therapeutic candidates** for a particular patient.

Input 1: Gene list

PANDRUGS

1. **Query PanDrugs using the Genes section**
2. **Load Example 3 (Genes Involved in PI3K-AKT-mTOR pathway)**
3. **Query the database with these genes**

Input 1: Gene list

PANDRUGS

- **Are all the genes in PanDrugs? How many drugs are in each approval status?**
- **Which is the most abundant mechanism of action?**
- **Which are the best therapeutic candidates?**
- **What are the evidences for these best therapeutic candidates?**
- **Is there any drug suggested by a gene that is discarded by another?**

Input 2: Gene ranking

PANDRUGS

1. **Query PanDrugs using the Gene Ranking section**
2. **Load Example file (Expression data for the top 500 up-regulated genes in a lung adenocarcinoma patient with *EGFR* alteration from TCGA)**
3. **Query the database with these genes**

Input 2: Gene ranking

PANDRUGS

- **How many genes are in PanDrugs?**
- **Which are the best candidates according to PanDrugs?**
- **What are the evidences for the drugs that rank higher in the assignments?**
- **Is there any drug approved for the same cancer type?**

Input 3: VCF

PANDRUGS

1. **Query PanDrugs using the Genomic Variant section**
2. **Load Example file (VCF of melanoma patient with mutant *BRAF* from TCGA)**
3. **Query the database with this file**

Input 3: VCF

PANDRUGS

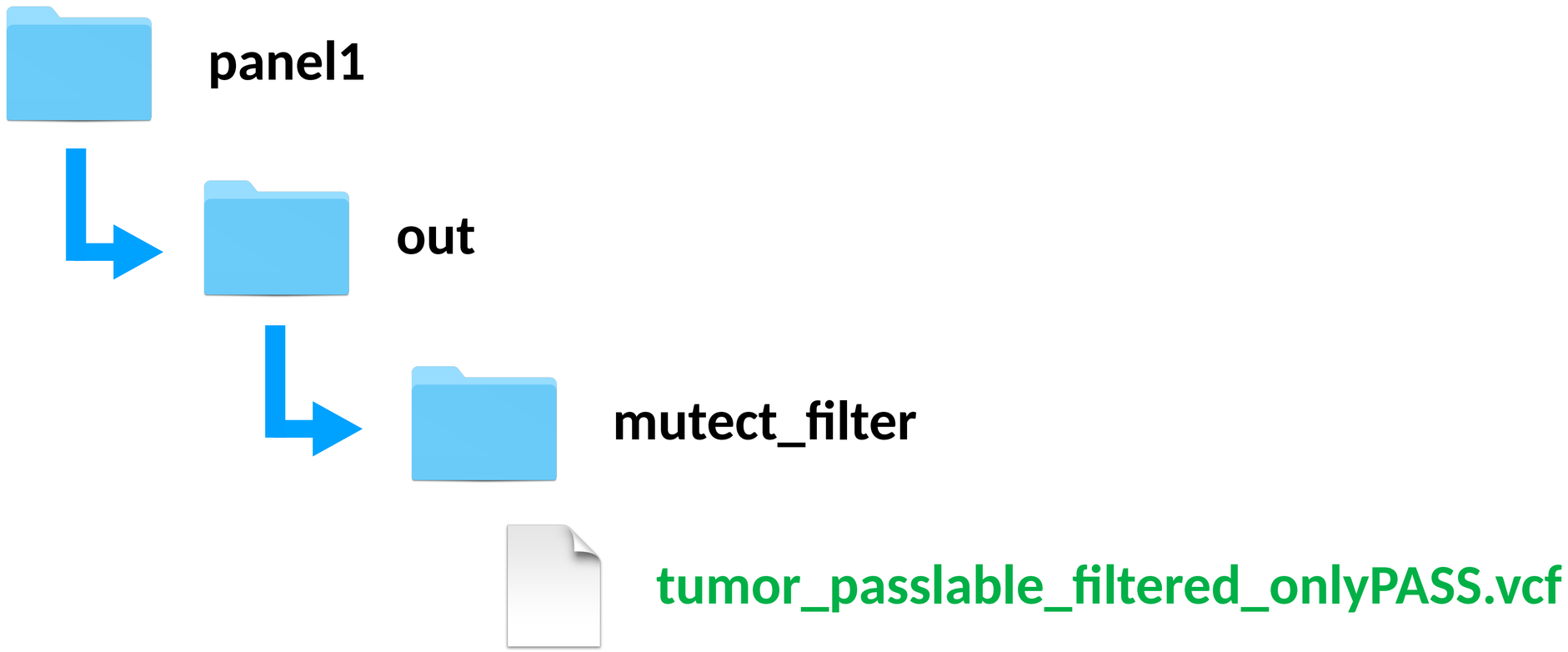
- **Which are the suggested therapies? Do they match the specific alterations?**
- **What are the evidences for the gene with the highest GScore?**
- **Is there any drug suggested by a gene that is discarded by another?**
- **Is there any drug approved for the same cancer type? Is there any drug in cancer clinical trials for this cancer type?**
- **Could a drug repositioning approach be used?**

Input 4: VCF

PANDRUGS

1. **Query PanDrugs using the Genomic Variant section**
2. **Load the VCF without annotations from the exercise of the CHP patient**
3. **Query the database with this file**

Input 4: VCF


panel1
out
mutect_filter
tumor_passlable_filtered_onlyPASS.vcf

Input 4: VCF

PANDRUGS

- **Which are the suggested therapies?**
- **Is there any drug suggested by a gene that is discarded by another?**
- **Is there any drug approved for the same cancer type? Is there any drug in cancer clinical trials for this cancer type?**
- **Could a drug repositioning approach be used?**