

CDS identification  
*Transdecoder*

CDS alignment on users database,  
filtering hits by evalue  
*BLAST* or *DIAMOND*

Clustering blast hits  
*CD-HIT*

Aligning hits and database sequences,  
building phylogenetic tree  
*MAFFT, IQ-TREE*

Aligning database sequences, building  
phylogenetic tree  
*MAFFT, IQ-TREE*

Filtering branches  $> 4 \times$  standard mean  
deviation of database tree  
*in-house python3 scripts*

Amino acid, nucleotide and contig  
sequences of PIA3 hits

if opsin=True  
Checking K296 and classifying opsin  
types using the database tree  
*in-house python3 scripts*

Wavelength-classified and  
K296-checked amino acid, nucleotide  
and contig sequences of PIA3 hits