Week 4

Saturday, 31 July 2021 19:22

SEROTYPE :

DISTINCT VARIATION WITHIN SPECIES OF BACTERIAS, VIRUS ON INDIVIDUALS

CLASSIFICATION BASED ON CELL-SURFACE ANTIGEN

EPIDEMIOLOGIC CLASSIFICATION

SALMONELLA SEROTYPE IDENTIFICATION

SeqSero TOOL

METHODS BEHIND
VALIDATION DATA
HOW TO USE THE TOOL
OUTPUT DATA

DIRECT	LOCATING GENE THAT ENCODES FOR PHENOTYPE	SeqSero
INDIRECT	MARKERS WE EXPECT TO FOLLOW SEROTYPE	MLST

RAW DATA — BWA
ASSEMBLED DATA — BLAST
} COMPATIBLE WITH BOTH

CURATED DATABASE

GENOTYPE ≠ PHENOTYPE
IF THE GENE IS NOT EXPRESSED

USE RAW DATA IF POSSIBLE

" NEWPORT OR BAREDO"

ANTIGENIC PROFILE	8:e, h:1, 2
O ANTIGEN	0-8
H1 ANTIGEN	e, h
H2 ANTIGEN	1, 2

} OUTPUT

IF 2 SEROTYPE THEN MLST
SOLVING AMBIGUITY

E. COLI SEROTYPE IDENTIFICATION

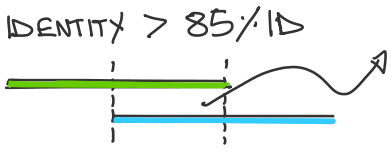
SerotypeFinder TOOL

SEROTYPING FROM SEQUENCING DATA

- DIRECT VS INDIRECT

ASSEMBLED BASED TOOL (BLAST) ←

IDENTITY > 85% ID



ALIGNMENT LENGTH > MIN LENGTH 60 %

- GENE LENGTH
- GENE NAME
- % IDENTITY
- CONTIG NAME

— CONTIG NAME
— WHERE GENE WAS FOUND
— POSITION IN CONTIG
— PREDICTED SEROTYPE

PLASMID REPLICON IDENTIFICATION — PLASMIDFINDER

PLASMID TYPING — pMLST

DEF DOUBLE STRANDED CIRCULAR OR LINEAR DNA MOLECULES

VERTICAL & HORIZONTAL TRANSFERT

THEY CONFER PHENOTYPE, POSITIVE TO NATURAL SELECTION

(MICROBIAL RESISTANCE)

IMPORTANT TO STUDY BACTERIA EPIDEMIOLOGY

PLASMID FINDER

IN SILICON DETECTION OF PLASMIDS (REPLICON)

pMLST

ANALYSIS & TYPING OF PLASMIDS (ST TYPE)

PLASMID
% IDENTITY
QUERY & HSP LENGTH

HSP LENGTH OF ALIGNMENT BETWEEN THE BEST MATCHING ALLELE AND THE CORRESPONDING SEQ IN GENOME

535/534 → 1 POSITION THAT CANNOT BE ALIGNED WITH REPLICON

ATTCG ATTGGA C CA
ATTCG ATTGGA C CG

CONFIGURATION, WHAT PLASMID?

BEFORE pMLST DO PLASMIDFINDER

LOCUS	% IDENTITY	HSP LENGTH	ALLELE LENGTH	GAP	ALLELE

MOBILE ELEMENT FINDER

WHY ARE WE INTERESTED?

IMPORTANT FOR BACTERIAL EVOLUTION

HORIZONTAL GENE TRANSFER

- TRANSDUCTION (PHAGE TRANSMISSION)
- TRANSFORMATION (DNA FROM ENVIRONMENT)
- CONJUGATION (TRANSPOSONS & PLASMIDS)

MOBILE ELEMENTS

CONJUGATORY PLASMIDS (CARRIES CELLULAR MACHINERY TO PERFORM CONJUGATION)

MOBILIZABLE ELEMENTS (NEEDS TO BE CO-MOBILIZED)

WHAT FUNCTION DO THEY PROVIDE?

FUNCTION — WITHIN CELLS VS BETWEEN CELLS

MOVING GENES BETWEEN PLASMIDS & CHROMOSOMES

DISSEMINATE GENES
MGE USEFUL FOR EVOLUTION

RAPID GENE-REARRANGEMENTS
CAN BE DELETERIAL TO ORGANISM

PREDICTION OF MOBILE ELEMENTS

ASSEMBLED SEQUENCE DATA
WE ARE INTERESTED IN CONTEXT

FULLY ALIGNMENT
PARTIAL ALIGNMENT
STRUCTURAL VARIATIONS

COVERAGE
SEQ. IDENTITY
LEVEL OF TRUNCATION
} MODEL QUALITY PARAMETERS

RESULT INDEX PAGE

CONTIG	PLASMID	#MGE	RESISTANCE	VARIANCE