

## *Staphylococcus chromogenes*

Causes **mastitis** i.e. inflammation (pain, redness, and swelling) in the udder of cows, also contaminating the milk they produce.



### Isolated from



Milk of affected cows



### Genomic Analysis



Revealed genes encoding efflux pumps that keep chemicals out and make this bacteria **resistant** to **antimicrobials**! Genes for invasive enzymes, capsule formation & metal uptake were also found!

### Insights



Genes coding for **toxins** and secretion systems were uncovered. These give the bacteria an advantage and **allows it to grow** inside cow's udder! This is an **important pathogen** causing bovine mastitis.

### Application



Genetic information can help design better drugs, thus ensuring **animal health** and consequently, milk quality, **food security** and even **public health**!



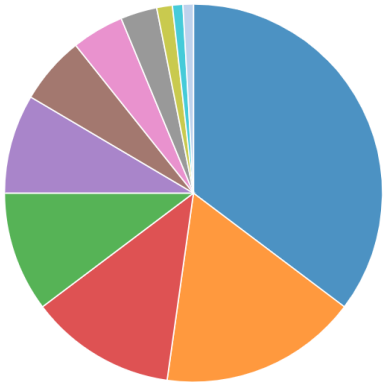
Staphylococcus chromogenes GCA\_019149085.1

Quality of Genome Assembly and Annotation:

Results from indigenously developed BHARAT analysis pipeline: (Bacterial Hybrid genome Assembly and Rapid Annotation Toolset)

Table 1: Assembly Details	
Contigs	31
GC Content	36.53
Contig L50	3
Genome Length	2,329,474 bp
Contig N50	237,107

Table 2: Annotated Genome Features	
CDS	2,328
tRNA	13
rRNA	2



Subsystem (Subsystems, Genes)	
METABOLISM	(79, 495)
PROTEIN PROCESSING	(38, 201)
STRESS RESPONSE, DEFENSE, VIRULENCE	(28, 105)
ENERGY	(23, 146)
DNA PROCESSING	(19, 75)
RNA PROCESSING	(13, 50)
CELLULAR PROCESSES	(10, 45)
MEMBRANE TRANSPORT	(7, 31)
REGULATION AND CELL SIGNALING	(3, 9)
CELL ENVELOPE	(2, 6)
MISCELLANEOUS	(2, 3)

Table 3: Antimicrobial Resistance Genes	
AMR Mechanism	Genes
Antibiotic resistance gene cluster,cassette,or operon	TcaB, TcaR
Antibiotic target in susceptible species	Alr, Ddl, dxr, EF-G, EF-Tu, folA, Dfr, folP, gyrA, gyrB, inhA, fabI, Iso-tRNA, kasA, MurA, rho, rpoB, rpoC, S10p, S12p
Efflux pump conferring antibiotic resistance	NorA, Tet(38)
Gene conferring resistance via absence	gidB
Protein altering cell wall charge conferring antibiotic resistance	GdpD, MprF, PgsA
Regulator modulating expression of antibiotic resistance genes	LiaF, LiaR, LiaS

Genome Assembly

