

Type IV secretion systems

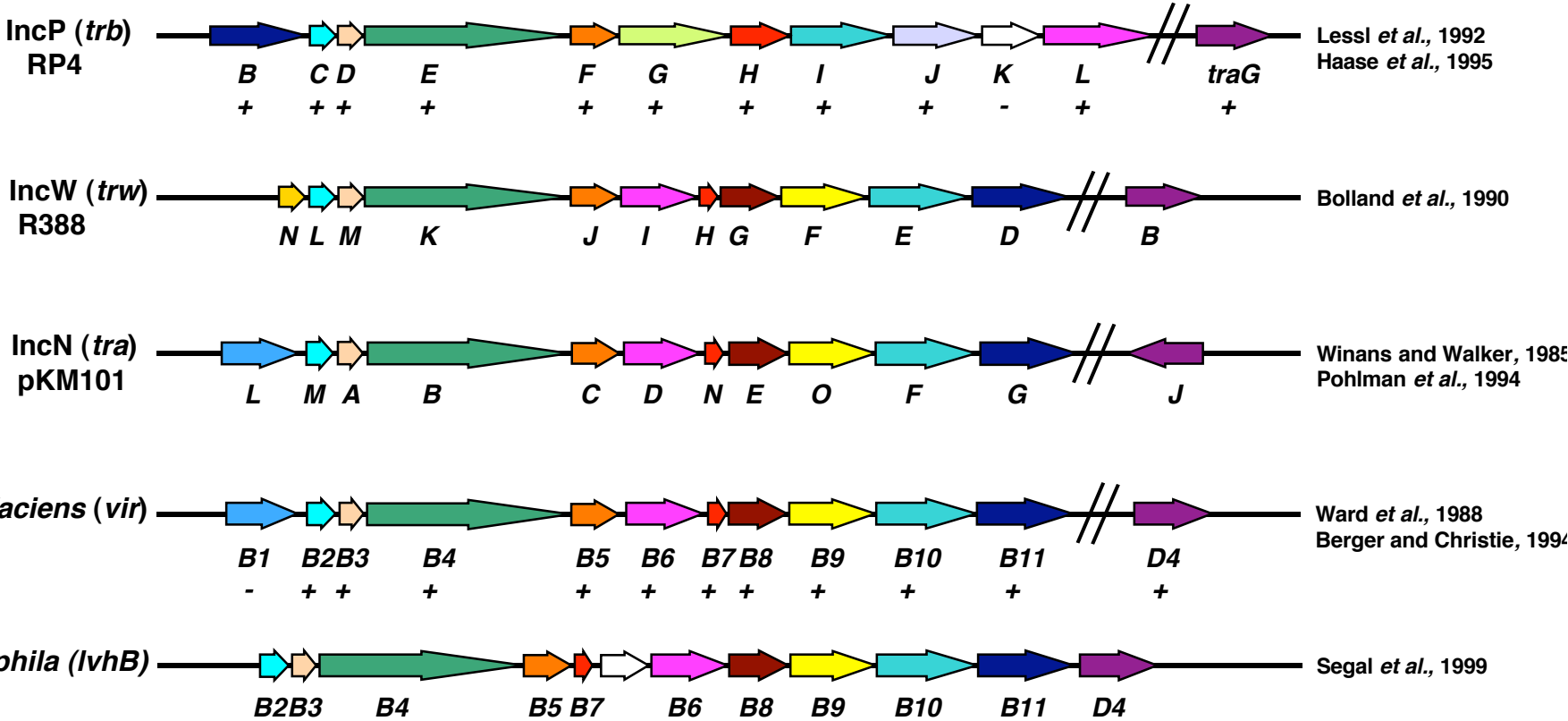
Last modification:
October 24th, 2003

Notes : Similar genes are represented with the same color.
The sign “+” denotes an essential gene for the function of the type IV secretion system.

Conjugation

Type IVA secretion systems

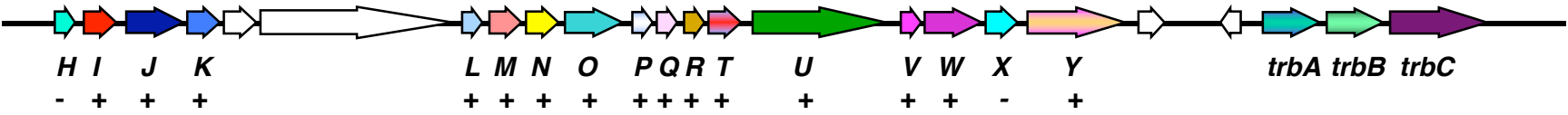
References



Type IVB secretion systems

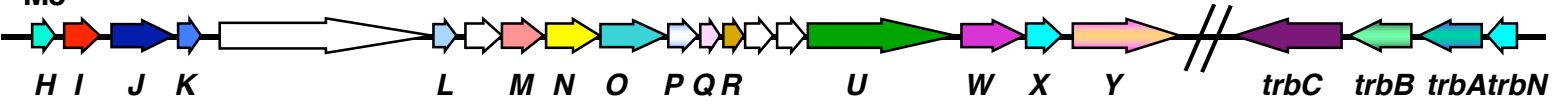
Incl (tra)
R64 and Collb-P9

Komano et al., 2000



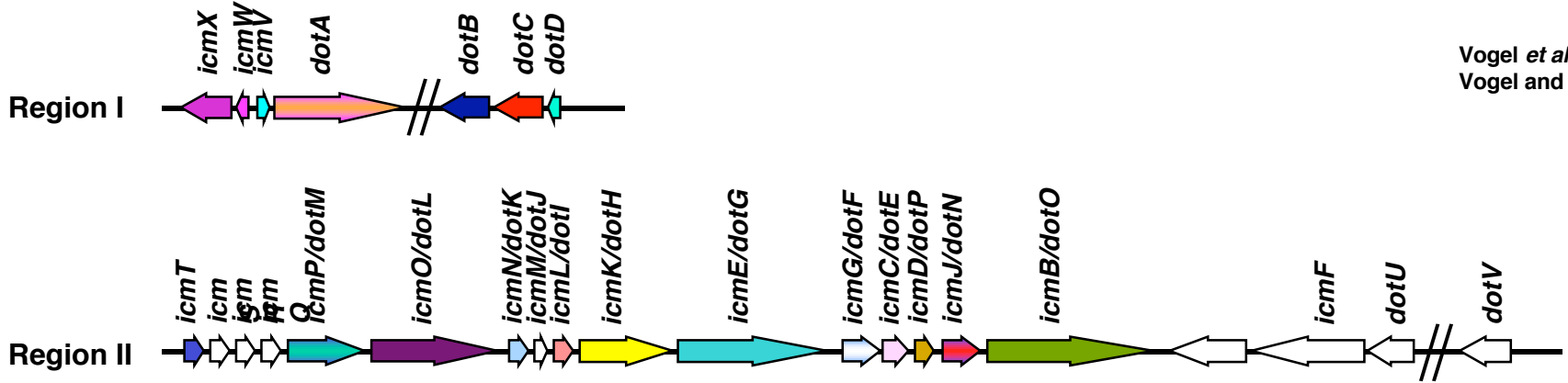
Incl (tra)
Citrobacter freundii pCTX-M3

Golebiewski M. et al., submitted to NCBI, accession NC_004464



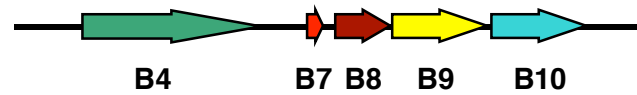
L. pneumophila (icm/dot)

Vogel et al., 1998
Vogel and Isberg, 1999



DNA uptake/release

Helicobacter pylori (com)

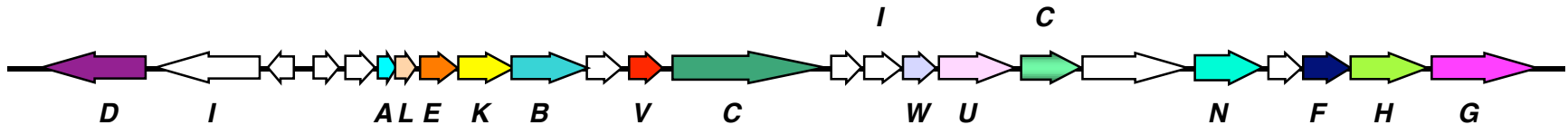


Hofreuter *et al.*, 1998, 2001

Neisseria gonorrhoeae

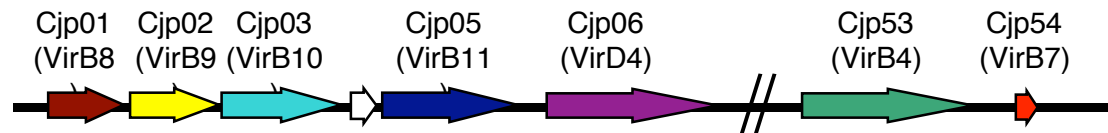
trb

tra



Dillard and Seifert, 2001

Campylobacter jejuni

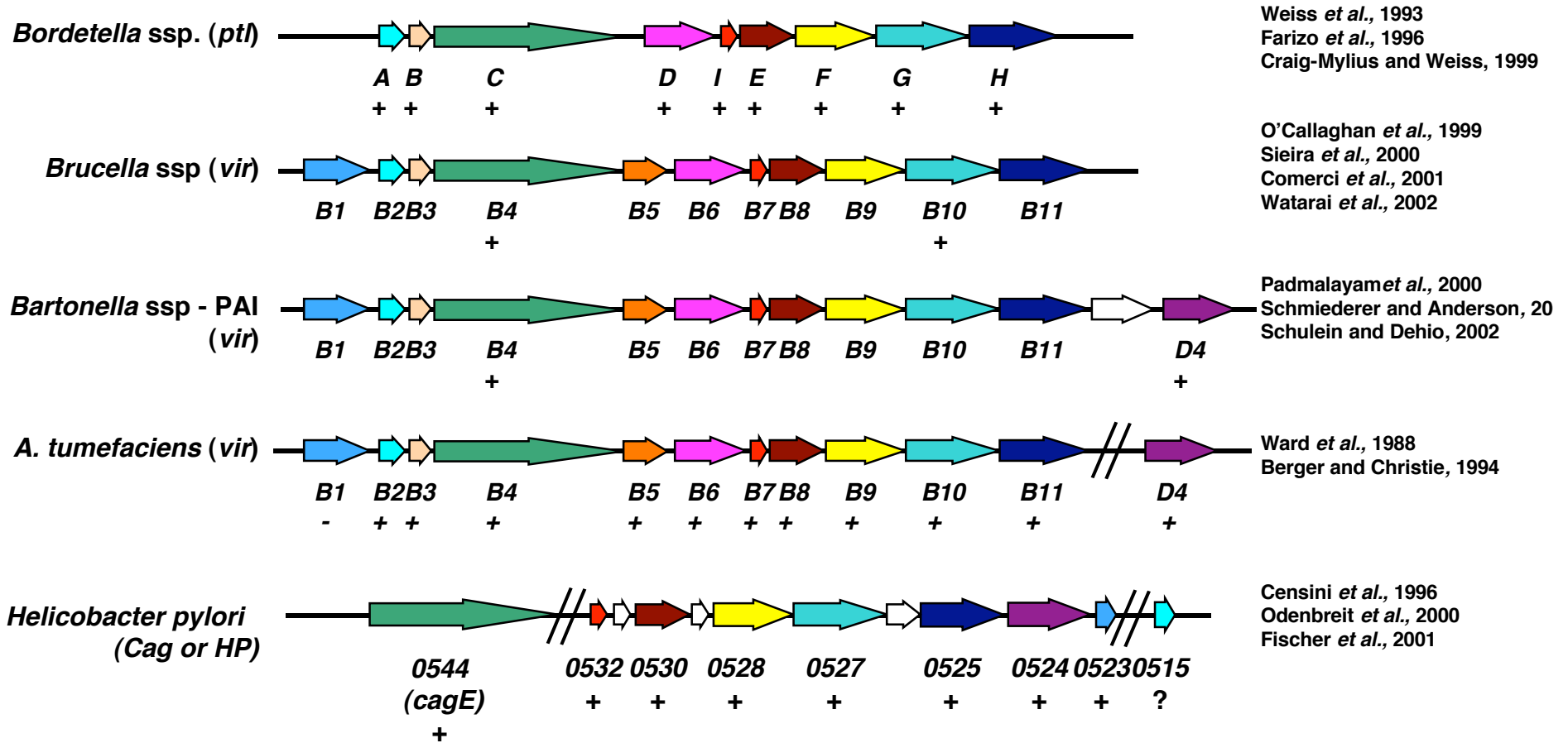


Bacon *et al.*, 2000, 2002

New data suggest that this is not a true competence system, but a function of this system in virulence has been demonstrated (Bacon *et al.*, 2000, 2002; Dirk Hofreuter, personal communication)

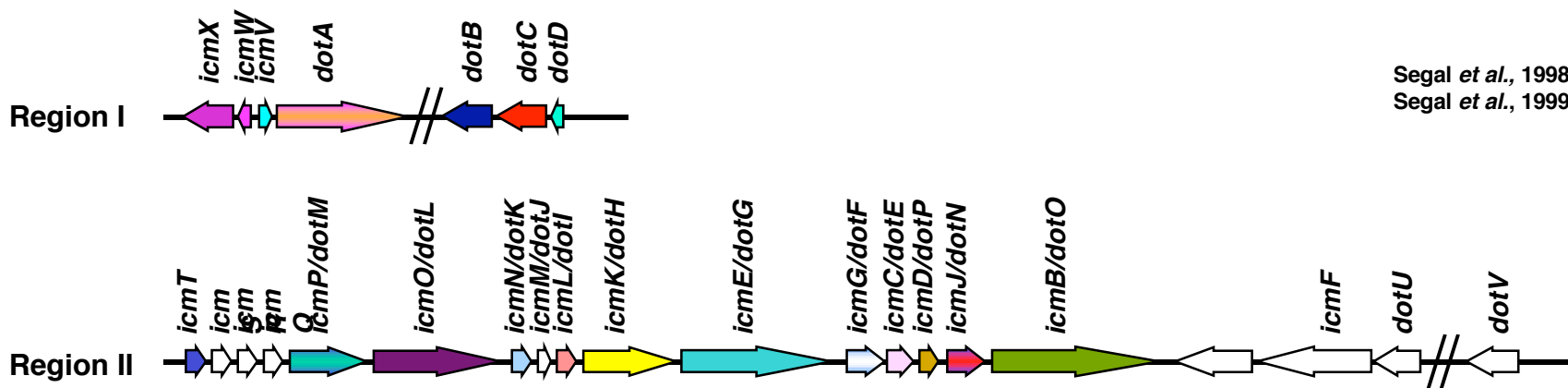
Effector translocators

Type IVA secretion systems



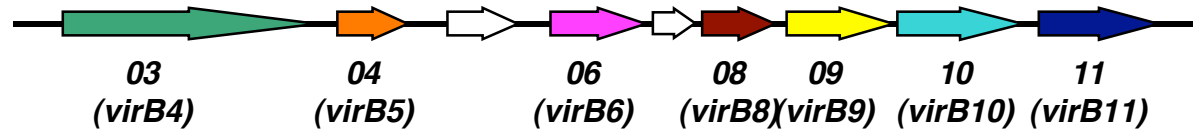
Type IVB secretion systems

L. pneumophila (*icm/dot*)



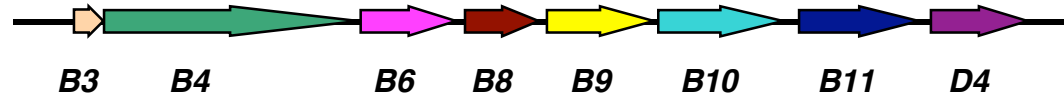
Unknown function

Actinobacillus actinomycetemcomitans st. VT747 (locus on the chromosome)(mag)



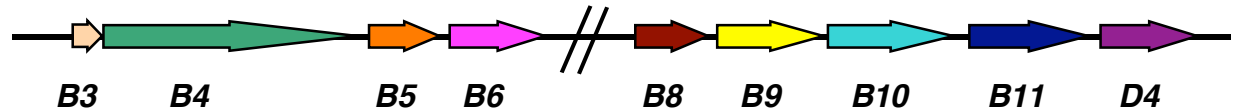
Novak *et al.*, 2001

Anaplasma phagocytophila (vir)



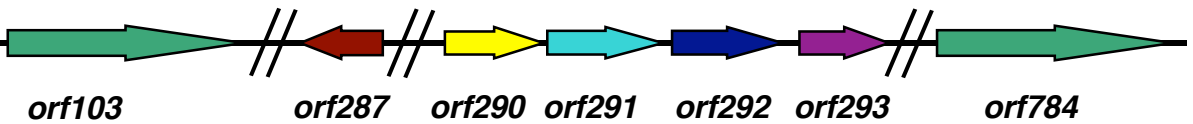
Ohashi *et al.*, 2002

Ehrlichia chaffeensis (vir)



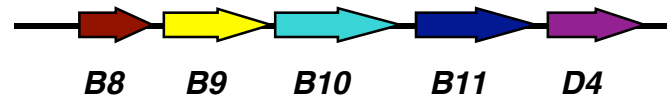
Ohashi *et al.*, 2002

Rickettsia ssp



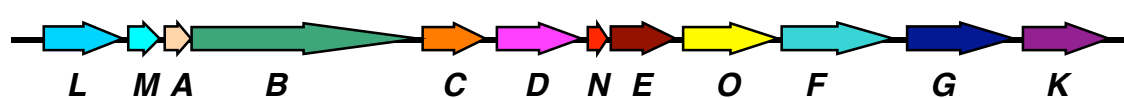
Andersson *et al.*, 1998

Wolbachia ssp. (vir)

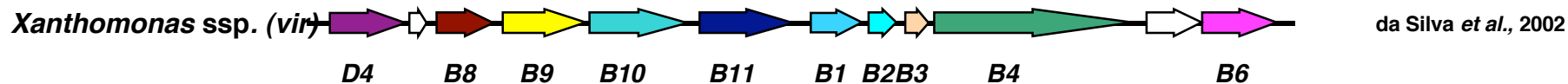
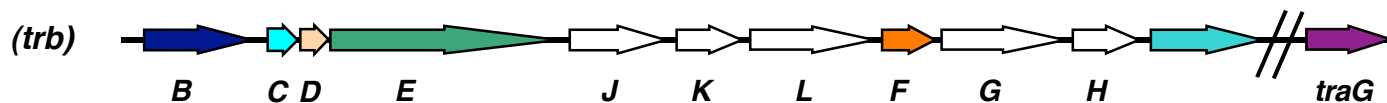
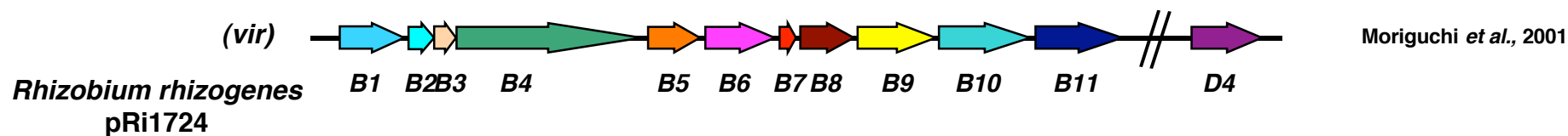
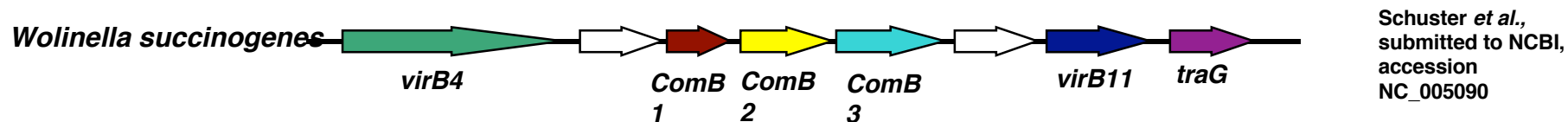
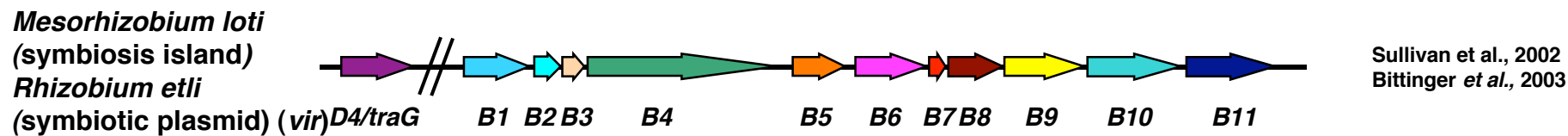
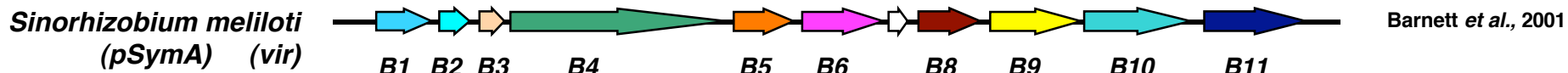


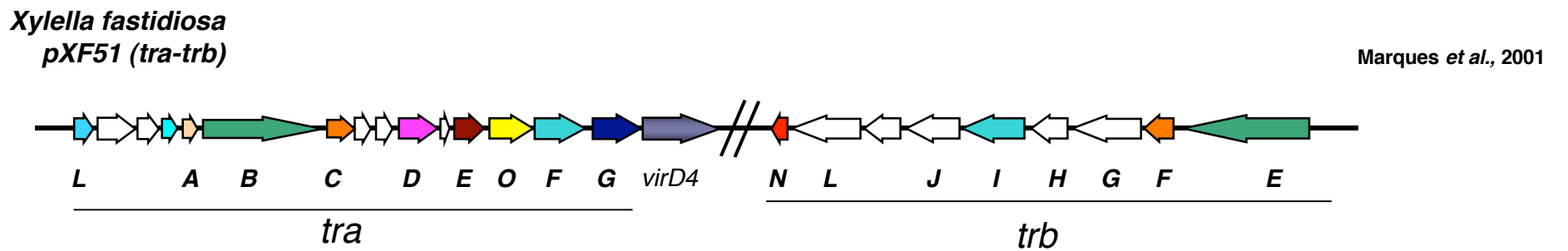
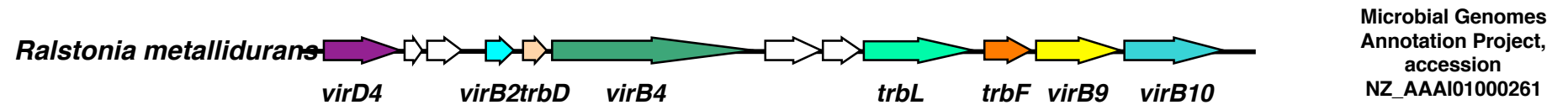
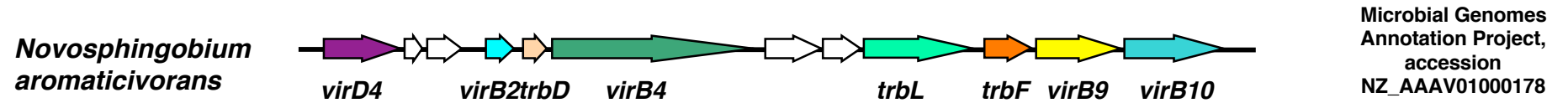
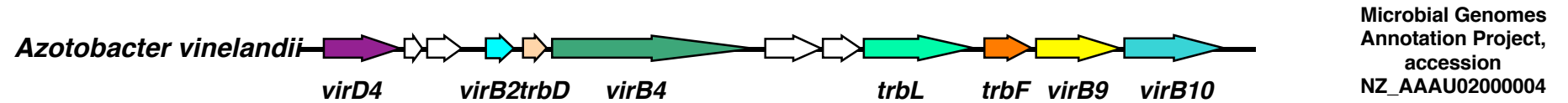
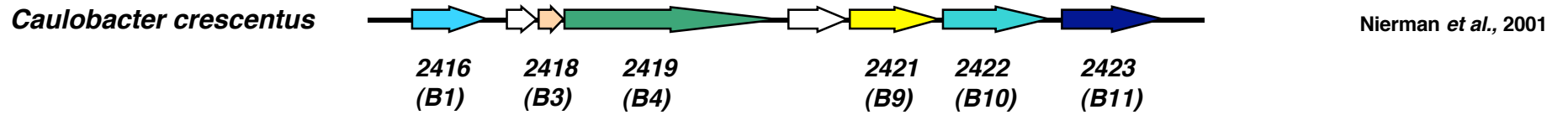
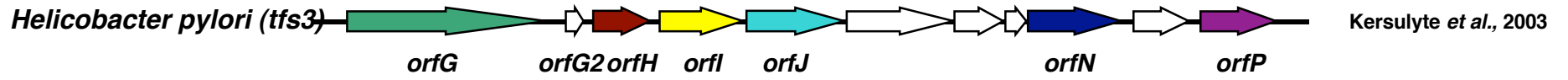
Masui *et al.*, 2000

Haemophilus influenzae pF3031 (tra)

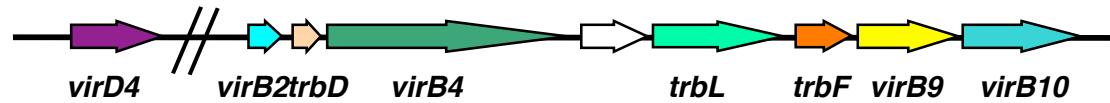


Mukhopadhyay S. *et al.*, submitted to NCBI, accession NC_004846





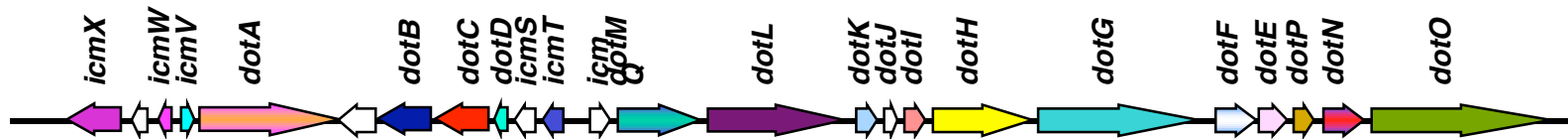
Rhodopseudomonas palustris



Microbial Genomes
Annotation Project,
accession
NZ_AAAF01000001

Type IVB secretion systems

Coxiella burnetii
(*dot/icm*)



Segal and Shuman, 1999
Sexton and Vogel, 2002
Zamboni *et al.*, 2003
Zusman *et al.*, 2003

Note:

Brucella ssp. groups *B. abortus*, *B. melitensis* and *B. suis*

Bartonella ssp. groups *B. henselae*, *B. quintana* and *B. tribocorum*

Bordetella ssp. groups *B. pertussis*, *B. parapertussis* and *B. bronchiseptica*

Xanthomonas ssp. groups *X. campestris*, *X. citri* and *X. axonopodis*

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