

Supplementary material:

Table 1: A) Nonessential and essential amino acids for humans and *Clostridium*, respectively. (*) Essential only in certain cases, (**) nonessential in certain cases; **B)** Putative glutamate specific component of ABC transporter in *C. perfringens*. This is based on the conservation of glutamate and aspartate transporter subunit (NCBI conserved domain PRK10797) in bacterial proteome.

A	
Non-essential amino acids of humans	Essential amino acids of <i>Clostridium</i>
Alanine	Alanine**
Arginine*	Arginine
Aspartic acid	Aspartic acid**
Cysteine*	Cysteine**
Glutamic acid	Glutamic acid
Glutamine*	Histidine
Glycine*	Isoleucine**
Proline*	leucine
Serine*	Methionine**
Tyrosine*	Tyrosine
Asparagine*	Threonine
	Tryptophan
	Phenylalanine
	Valine

B	
<i>Clostridium perfringens</i> Biotypes	Putative Gene/ORF for periplasmic glutamate binding protein *
Type A - SM101	CPR_1324
Type A - ATCC 13124	CPF_1531
Type A- Strain 13	CPE_1324
Type A- F262	HA1_08167
WAL-14572	HMPREF9476_00976

Table 2: Predicted functional partners of the aligned consensus of putative proteins from *C. perfringens* type-A strains using STRING database search. The ABC-type amino acid transport/signal transduction systems, periplasmic component/domain (COG0834) was the input.

COGs	Functional partner
COG0765	ABC-type amino acid transport system, permease component
COG1126	ABC-type polar amino acid transport system, ATPase component
COG0642	Signal transduction histidine kinase
COG0784	FOG- CheY-like receiver
COG4215	ABC-type arginine transport system, permease component
COG2199	FOG- GGDEF domain
COG2197	Response regulator containing a CheY-like receiver domain and an HTH DNA-binding domain
COG2202	FOG- PAS/PAC domain
COG0745	Response regulators consisting of a CheY-like receiver and a winged-helix DNA-binding domain
COG5001	Predicted signal transduction protein containing a membrane domain, an EAL and a GGDEF domain