

Staphylococcus aureus
Enterotoxins



Staphylococcal Enterotoxins
(SEs) Reagents

Creative Diagnostics now offers a comprehensive set of staphylococcal enterotoxin reagents that can be used to screen SEs.

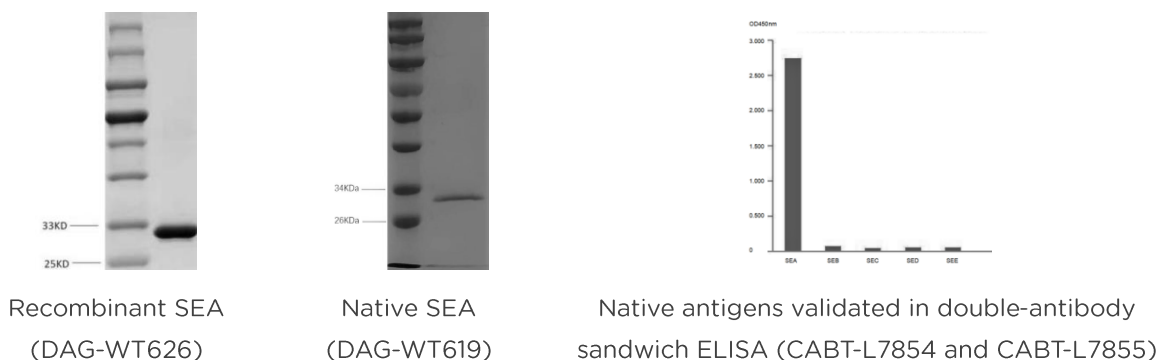
Introduction

Staphylococcus aureus is a spherical, Gram-positive coccus of approximately 1 µm in diameter and forms short chains or grape-like clusters. *S. aureus* can be found in the air, dust, sewage, water, environmental surfaces, domestic animals as well as humans. Several virulence factors of *S. aureus* strains have been reported, and enterotoxins are the most notable virulence factors, as they can cause the sporadic food-poisoning syndromes or foodborne outbreaks.

22 different staphylococcal enterotoxins (SEs) have been described since 1959, including enterotoxins A (SEA), B (SEB), C (SEC1), C2 (SEC2), C3 (SEC3), D (SED), and E (SEE). These toxins are non-glycosylated, globular single-chain proteins with low molecular weight ranging from 19 to 29 kDa. They have some important properties, including toxicity to humans in minute quantities, remarkable tolerance to extreme denaturing conditions (heat treatment, low pH and proteolytic digestion), the ability to induce emesis as well as noted superantigenicity. SEs act as superantigens that bind to class II MHC molecules on antigen presenting cells and stimulate large populations of T cells. Therefore, they can be used for cytokine-based cancer therapy.

Creative Diagnostics has developed a range of staphylococcal enterotoxin antigens and antibodies that can be used for *in vitro* detection and diagnosis research. They are well-validated in double-antibody sandwich enzyme-linked immunosorbent assay. The newly launched enterotoxins include five major classical types of SEs (SEA, SEB, SEC2,3, SED, and SEE).

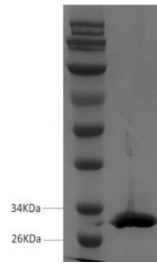
Enterotoxins A (SEA)



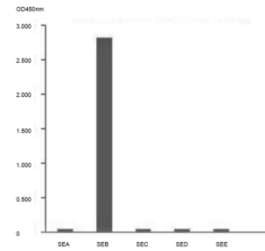
Cat. No.	Product Name	
DAG-WT626	Recombinant <i>Staphylococcus aureus</i> Enterotoxin A (SEA)	✓ Not cross-react with SEB, SEC, SED and SEE
DAG-WT619	Native <i>Staphylococcus aureus</i> Enterotoxin A (SEA)	✓ Double-antibody sandwich ELISA sensitivity: 1.0 ng/ml
CABT-L7854	Cap: Mouse anti <i>S.aureus</i> SEA monoclonal antibody	
CABT-L7855	Det: Mouse anti <i>S.aureus</i> SEA monoclonal antibody	



Recombinant SEB
(DAG-WT627)



Native SEB
(DAG-WT620)

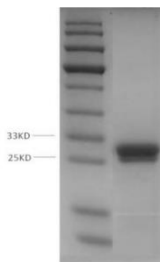


Native antigens validated in double-antibody sandwich ELISA (CABT-L7856 and CABT-L7857)

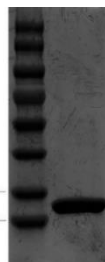
Cat. No.	Product Name
DAG-WT627	Recombinant Staphylococcus aureus Enterotoxin B (SEB)
DAG-WT620	Native Staphylococcus aureus Enterotoxin B (SEB)
CABT-L7856	Cap: Mouse anti S.aureus SEB monoclonal antibody
CABT-L7857	Det: Mouse anti S.aureus SEB monoclonal antibody

- ✓ Not cross-react with SEA, SEC, SED and SEE
- ✓ Double-antibody sandwich ELISA sensitivity: 0.5 ng/ml

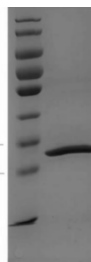
Enterotoxins C (SEC)



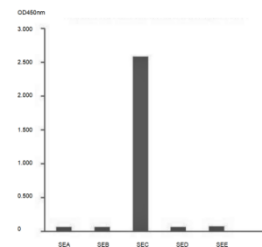
Recombinant SEC
(DAG-WT628)



Native SEC2
(DAG-WT621)



Native SEC3
(DAG-WT622)

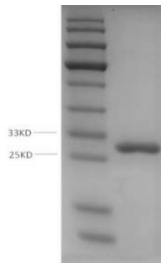


Native antigens validated in double-antibody sandwich ELISA (CABT-L7858 and CABT-L7859)

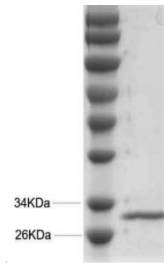
Cat. No.	Product Name
DAG-WT628	Recombinant Staphylococcus aureus Enterotoxin C (SEC)
DAG-WT621	Native Staphylococcus aureus Enterotoxin C2 (SEC2)
DAG-WT622	Native Staphylococcus aureus Enterotoxin C3 (SEC3)
CABT-L7858	Cap: Mouse anti S.aureus SEC monoclonal antibody
CABT-L7859	Det: Mouse anti S.aureus SEC monoclonal antibody

- ✓ Not cross-react with SEA, SEB, SED and SEE
- ✓ Double-antibody sandwich ELISA sensitivity: 1.0 ng/ml

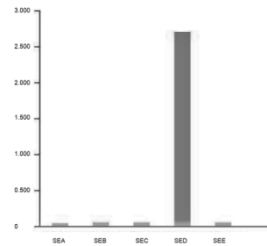
Enterotoxins D (SED)



Recombinant SED
(DAG-WT629)



Native SED
(DAG-WT623)

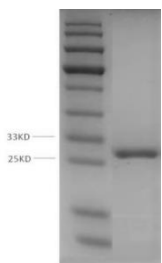


Native antigens validated in double-antibody sandwich ELISA
(CABT-L7860 and CABT-L7861)

Enterotoxins B (SEB)

Cat. No.	Product Name	
DAG-WT629	Recombinant Staphylococcus aureus Enterotoxin D (SED)	✓ Not cross-react with SEA, SEB, SEC and SEE
DAG-WT623	Native Staphylococcus aureus Enterotoxin D (SED)	
CABT-L7860	Cap: Mouse anti S.aureus SED monoclonal antibody	✓ Double-antibody sandwich ELISA sensitivity: 1.0 ng/ml
CABT-L7861	Det: Mouse anti S.aureus SED monoclonal antibody	

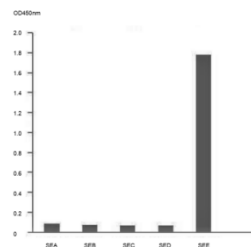
Enterotoxins E (SEE)



Recombinant SEE
(DAG-WT630)



Native SEE
(DAG-WT624)



Native antigens validated in double-antibody sandwich ELISA
(CABT-L7862 and CABT-L7863)

Cat. No.	Product Name	
DAG-WT630	Recombinant Staphylococcus aureus Enterotoxin E (SEE)	✓ Not cross-react with SEA, SEB, SEC and SED
DAG-WT624	Native Staphylococcus aureus Enterotoxin E (SEE)	
CABT-L7862	Cap: Mouse anti S.aureus SEE monoclonal antibody	✓ Double-antibody sandwich ELISA sensitivity: 1.0 ng/ml
CABT-L7863	Det: Mouse anti S.aureus SEE monoclonal antibody	

ADVANTAGES

- Protein purity greater than 95%
- Specific for the different types of SEs
- Less cross-reactivity with other types
- High sensitivity in double-antibody sandwich ELISA
- Mab pairs suitable for use in ELISA and LFIA

APPLICATIONS

- Food safety monitoring
- In vitro immunodiagnosics
- Development of immune-modulating agents

REFERENCES

1. Ortega E, Abriouel H, Lucas R, et al. (2010). Multiple roles of *Staphylococcus aureus* enterotoxins: pathogenicity, superantigenic activity, and correlation to antibiotic resistance. *Toxins*. 2(8), 2117–2131.
2. Pinchuk IV, Beswick EJ, Reyes VE. (2010). Staphylococcal enterotoxins. *Toxins*. 2(8), 2177–2197.
3. Hennekinne JA, Buyser MLD, Dragacci S. (2012). *Staphylococcus aureus* and its food poisoning toxins: characterization and outbreak investigation. *FEMS Microbiology Reviews*. 36(4), 815–836.
4. Argudín MÁ, Mendoza MC, Rodicio MR. (2010). Food poisoning and *Staphylococcus aureus* enterotoxins. *Toxins*. 2(7), 1751–1773.

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