

Crystal Structure of SSL11, a Superantigen-related Toxin from *Staphylococcus Aureus*

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The pathogenic bacterium *Staphylococcus aureus* expresses a large number of protein toxins, which contribute to serious human disease. Analysis of the *S. aureus* genome identified a cluster of genes, encoding what are now called "staphylococcal superantigen-like" (SSL) proteins [1]. We report structural and functional studies on one of these proteins, SSL11.

SSL11 was expressed in *E. coli*, purified and crystallized from 0.2M NaH₂PO₄, 20% PEG3350. The crystals are monoclinic, space group P2₁, with a=52.2, b=100.9, c=79.6 Å, β=91.2°, with 4 molecules in the asymmetric unit. The crystal structure was solved by molecular replacement, using the structure of the related SET3 (SSL5) [2] as search model, and is being refined at 2.2 Å resolution (R=0.308, R_{free}=0.337). The fold of SSL11 very closely resembles that of SSL5 and shows that it belongs to the wider superantigen family.

Functional studies show that SSL11 does not have superantigen activity, but instead binds with high affinity to the human IgA receptor. This suggests a role in human disease. Intriguingly, SSL11 forms a dimer in the crystal that closely resembles that formed by SSL5 (but not by superantigens), suggesting a functional importance.

[1] Lina G., Bohach G.A., Nair S.P., Hiramatsu K., Jouvin-Marche E., Mariuzza R., *J. Infect. Dis.*, 2004, **189**, 2334. [2] Arcus V.L., Langley R., Proft T., Fraser J.D., Baker E.N., *J. Biol. Chem.*, 2002, **27**, 32274.

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