

**Understanding Nutrient Uptake Systems in *S. sanguinis*, an Opportunistic Pathogen responsible for Subacute Infective Endocarditis**

**Marshall “Julius” Koons** and Vijayakumar Somalinga

Department of Biological and Biomedical Sciences, Southwestern Oklahoma State University,  
Weatherford, OK

In the United States, 42,000 people will be hospitalized with subacute infective endocarditis (SIE) every year. Untreated, SIE is 100% fatal, and even with treatment, mortality rate from SIE is as high as 30%. Therapeutic strategy for SIE involves high-dose, intravenous antibiotic therapy and invasive surgical procedures, so it is imperative to better understand SIE, and its causative agent. *Streptococcus sanguinis*, a leading cause of SIE, is an opportunistic pathogen that is part of the oral microbiome of about 80% of the general population. In people with valvular heart disease, *S. sanguinis* enters the blood stream following everyday mundane activities and can establish itself in nodule-like structures called cardiac vegetations. Although the process by which *S. sanguinis* establishes itself in cardiac vegetation is well understood, the mechanisms by which *S. sanguinis* obtains nutrients for survival in cardiac vegetations remains uncharacterized. Nutrient uptake mechanisms, including amino acid uptake, is not well characterized in *S. sanguinis*. We recently identified a ~35 kDa protein, SSA0908, with homology to an amino acid substrate binding protein (SBP) from *Clostridioides difficile*. SBP's are part of ATP-binding cassette (ABC) transporters involved in the import or export of substrates, including amino acids, in all domains of life. We recently purified SSA0908, and established preliminary crystallization conditions using sitting-drop method. We are currently trying to standardize the crystallization conditions for SSA0908 to obtain diffraction quality crystals to elucidate the structure of this protein to understand amino acid uptake in *S. sanguinis*.