Structural Studies of Adhesion P1 of *Streptococcus mutans*

Tang, W. (U. of Florida, Biochemistry and Molecular Biology); Brady, L.J. (U. of Florida, Oral Biology); Long, J.R. (U. of Florida, Biochemistry and Molecular Biology)

Introduction

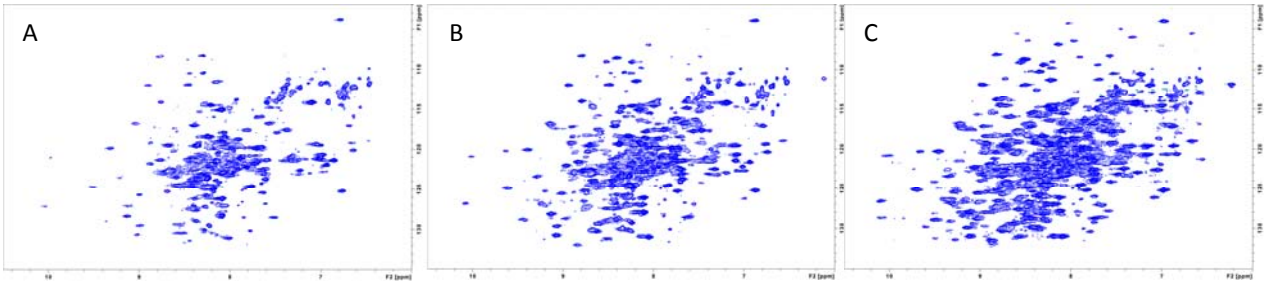
Streptococcus mutans is a major etiologic agent of human dental caries. It is particularly effective at colonizing hard tissues mediated by sucrose-dependent and independent mechanisms. In the absence of sucrose, its wall-associated fibrillar lectin P1, previously known as Antigen I/II or PAc, facilitates attachment to the acquired pellicle on teeth [1]. This multifunctional adhesin mediates interactions with salivary constituents, host cell matrix proteins such as fibronectin, fibrinogen, collagen, and other oral bacteria.

Our previous study [2] has demonstrated that, P1 possesses functional amyloid properties, which contributes to *S. mutans* virulence. Structures of various regions of P1 have been studied by X-ray crystallography [3]. Determining P1 ultrastrucuture is highly likely to reveal critical information regarding the process of amyloidogenesis and biofilm formation by *S. mutans*. Here, we represent our preliminary results using high resolution NMR.

Experimental

The C-terminal of P1 has been expressed and purified. Despite its relatively large size, which is around 60 kDa, we have successfully collected some preliminary high resolution NMR data using the 600-cryo magnet in AMRIS and the 800 MHz magnet at the NMR facility in Tallahassee.

Results and Discussion



Figures A, B and C: Shown in the above figure are the ^{1}H-^{15}N TROSY spectra of uniformly ^{15}N labeled C-terminus at (A) 15°C (B) 25°C and (C) 35°C.

Conclusions

Through various experiments, we have successfully optimized the condition for TROSY based 2D/3D experiments. We'll be conducting a series of experiments in the aim of assigning most, if not all, the resonances. By doing so, we hope to gain more insights into the initiation of amyloidogenesis of P1.

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References

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[3] Heim, K.P., *et al*., Proc Natl Acad Sci., **111**, 15746-15751 (2014).