QCB Evenings

Wednesday, Oct. 14 • 6:00pm • Chemistry C122

Pterin-Dependent Surface Attachment Control in *Agrobacterium tumefaciens*

NATHAN FEIRER, FUQUA LAB

One of the primary factors mediating surface attachment in the plant pathogen *Agrobacterium tumefaciens* is an adhesin called the unipolar polysaccharide (UPP). The gene dcpA, which encodes a dual function **d**iguanylate **c**yclase (DGC)/**p**hosphodiesterase (PDE) protein, plays an important role in the regulation of UPP production. DcpA has discrete DGC and PDE domains that catalyze synthesis and degradation, respectively, of the second messenger c-di-GMP, which plays a prominent role in regulating the motile-to-sessile transition in *A. tumefaciens*. The balance of DcpA's DGC and PDE activities is controlled by the action of the protein PruA (**P**teridine **R**eductase **A**). We have shown that PruA catalyzes the synthesis of the novel pterin, 2'-O-methylmonapterin in *A. tumefaciens*. We have found that PruR (**p**terin **r**esponsive **U**PP **R**egulator), a putative pterin-binding protein, also participates in regulation of DcpA. Together, the PruA protein, through production of a monapterin product, and requiring the PruR protein, biases DcpA strongly towards its PDE activity, and this bias is critical for maintaining UPP production and other attachment processes in the off state when *A. tumefaciens* is not associated with surfaces.

Structural Engineering of Virus–like Particles for Antigen Delivery

BENJAMIN SCHWARZ , DOUGLAS LAB

Virus–like particles (VLPs) provide scaffolds with pathogen–like polyvalent structures, making them useful platforms for antigen delivery to the immune system. Their polyvalent cage architecture non-specifically stimulates immunity and has been shown to direct non-damaging recruitment of immune cells to the lungs. The concentration of multiple copies of a cargo to a single particle ensures that each cell that encounters a particle gets a high dose of the cargo. Encapsulation of antigens within VLPs has been shown to enhance antigen–specific CD8+ T cell responses presumably through cross-presentation of exogenous antigens through the endogenous pathway. We have utilized the VLP from bacteriophage P22 to encapsulate antigens of increasing complexity to address a range of viral and bacterial pathogens. The broad applicability of this strategy enables the design of concerted, multi-antigen responses and the fundamental examination of antigen–processing pathways at the innate–adaptive immune interface.

All QCB Trainer Lab Personnel are invited to attend.
Food and beer will be provided.