



Department of Chemistry and Biochemistry Colloquium Speaker



Dr. Andrew Lees

Fina Biosolutions LLC, Rockville, MD 20850 USA

"Towards Affordable Conjugate Vaccines: Efficient Chemistry, Low Cost Carrier Protein and Supporting New Entrants"

Abstract: Conjugate vaccines to prevent *S. pneumonia*, *Haemophilus influenzae* type b and meningococcal disease have been very effective at reducing disease. Many additional conjugate vaccines are under development, including ones in diverse areas such as malaria transmission blocking, anti-cancer, anthrax and drug addiction. Among pediatric vaccines, conjugates are some of the most complex and expensive vaccines to produce, resulting in a high financial burden, especially for lesser developed countries and vaccine funders such as the Global Alliance for Vaccines. A limited number of suppliers reduces competition, frequently allowing for near monopoly pricing. Efficient manufacturing methodologies can help to reduce costs and increase vaccine supply. Of the three commonly used conjugation chemistries, cyanogen bromide, reductive amination and CDAP, CDAP gives the highest yields. High yields with CDAP chemistry can be achieved with a good understanding of the chemistry and the use of Design of Experiment to optimize multiple variables. Another costly element of conjugate vaccines is the widely used carrier protein, CRM197, which traditionally has been produced in *Corynebacteria* at low yield. Commercially available CRM197 has been too expensive for many researchers, inhibiting R&D work. We have achieved high expression levels of soluble, properly-folded CRM197 in *E. coli* (EcoCRM), resulting in low cost CRM197. "EcoCRM", economical CRM from *E. coli*, can reduce the cost of conjugate vaccine research as well as the price of the clinical product.

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