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Andrew Lees

Fina Biosolutions LLC, USA

Towards affordable conjugate vaccines: Efficient chemistry and low cost carrier protein

Conjugate vaccines to prevent *Streptococcus pneumoniae*, *Hemophilus 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. 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.

Biography

Andrew Lees is the Founder and Scientific Director of Fina Biosolutions LLC, in Rockville, USA. He is the author of over 60 peer reviewed articles and holds over 20 patents. Conjugation chemistry developed by him is used by GSK, the Serum Institute of India, The Chengdu Institute of Biological Products and others in their *S. pneumoniae* and meningococcal conjugate vaccines. He is also an Associate Professor at the Center for Vaccine Development at the University of Maryland, School of Medicine. He holds a BS in Chemistry from Harvey Mudd College and a PhD in Biophysics from The Johns Hopkins University.

ALEES@Finabio.com

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