

CURRICULUM VITAE

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EDUCATION

The Johns Hopkins University, Baltimore, MD
Ph.D. in Biophysics, 1984
Dissertation Topic: Effects of Brevin and Vitamin D
Binding Protein on Actin Assembly and

Disassembly

Harvey Mudd College, Claremont, CA
Bachelor of Science in Chemistry, June, 1976

RESEARCH EXPERIENCE and APPOINTMENTS

Fina BioSolutions LLC. Rockville, MD
Scientific Director; Vaccines, bioconjugation, protein purification.
(Aug, 2006-present).

BioExcellence India, Pune, India, Member Scientific Advisory Board
(July 2009- Present).

Ancora Pharmaceuticals, Inc., Medford, MA. Member Scientific Advisory
Board. (Dec, 2006-Present).

University of Maryland, College Park, MD
Senior Scientist Bioprocessing Research and Educational Program. (Oct
2006- Present).

Dept. of Medicine, Uniformed Services University of the Health
Sciences, Bethesda, MD
Research Instructor (1988-1993); Assistant Research Professor
(1993-1998); Associate Research Professor (1998-1999; adjunct 1999-
Present) Study of lymphocyte activation, synthesis of antibody
conjugates, development of vaccine immunoconjugates.

Biosynexus, Inc. Gaithersburg, MD
Director of Vaccine Development. Vaccine immunoconjugates, protein
purification. (Aug, 1999- June, 2006).

Virion Systems, Inc., Rockville, MD
Senior Research Scientist, Vaccine immunoconjugate development. (June,
1993-July, 1999).

Dept. of Biophysics, The Johns Hopkins School of Medicine, Baltimore,
MD Post-Doctoral Fellow under Dr. H.M. Dintzis. Synthesis and study of
novel protein and peptide antigens for vaccines. (Oct. 1985-July 1988)

Dept. of Biophysics, The Johns Hopkins University, Baltimore, MD

Predocotrinal Candidate under Dr. S. Lin. Isolation of actin-binding proteins, control of actin assembly and disassembly; regulation of sugar transport, synthesis of drugs to inhibit sugar uptake. (Sept. 1976-Oct. 1983).

Dept. of Chemistry, Harvey Mudd College, Claremont, CA
Research Assistant. Exchange of hydrogen on NADH derivatives (1975-1976), Synthesis of highly oxidized organic bismuth compounds. (Summer, 1975).

Centre de Neurochimie, Universite de Strasbourg, Strasbourg, France.
Research Assistant. Lipid composition of dwarf mice brain, purification of a cerebroside sulphatransferase. (Sept 1973-July 1974).

PUBLICATIONS

1. **Lees**, A., L.L. Sarlieve, M.M. Nescovic, M. Wintzerth, and P. Mandel. Changes in brain complement during development of mice homozygous for the locus dwarf (dw). *Neurochem. Res.* 2:11, 1977.
2. **Lees**, A. and S. Lin. 7-acetylchtochalasin B: Differential effects on sugar transport and cell motility. *J. Supramol. Struct.* 12:185, 1979.
3. **Lees**, A., S. Lin, and J.G. Haddad. Comparison of the effects of two serum proteins on actin assembly and disassembly. *Biochem.* 23:3038, 1984.
4. **Lees**, A., S.C. Morris, G. Thyphronitis, J.M. Holmes, J.K. Inman, and F.D. Finkelman. Rapid stimulation of large specific antibody responses with conjugates of antigen and anti-IgD antibody. *J. Immunol.* 145:3594, 1990.
5. Lindsberg, M-L., M. Brunswick, H. Yamada, A. **Lees**, J.K. Inman, C.H. June, and J. J. Mond. Biochemical analysis of the immune B cell defect in xid mice. *J. Immunol.* 147:3774, 1991.
6. Pecanha, L.M., C.M. Snapper, A. **Lees** and J.J. Mond. Lymphokine control of Type 2 antigen response. IL-10 inhibits IL-5 but not IL-2-induced Ig secretion by T cell-independent antigens. *J. Immunol.* 148:3427, 1992.
7. Snapper, C.M., T. M. McIntyre, R. Mandler, L.M.T. Pecanha, F.D. Finkelman, A. **Lees**, and J. J. Mond. Induction of IgG3 secretion by IFN- γ : A model for class switching in response to TI-2 antigens. *J. Exp. Med.* 175:1367, 1992.
8. Campbell, K.A., A. **Lees**, F.D. Finkelman, and D.H. Conrad. Co-crosslinking Fc ϵ R2/CD23 with B cell surface immunoglobulin modulates B cell activation. *Eur. J. Immunol.* 22:2107, 1992.
9. Finkelman, F.D., A. **Lees**, and S.C. Morris. Antigen presentation by B lymphocytes to CD4⁺ T lymphocytes *in vivo*: Importance for B lymphocyte and T lymphocyte activation. *Seminars in Immunol.* 4:247, 1992.

10. Morris, S.C., A. Lees, J.K. Inman, and F.D. Finkelman. Role of antigen-specific T cell help in the generation of in vivo antibody responses. I. Antigen-specific T cell help is required to generate a polyclonal IgG1 response in anti-IgD antibody-injected mice. *J. Immunol.* 149:3836, 1992.
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12. Snapper, C.M., H. Yamada, D. Smoot, R. Sneed, A. Lees, and J.J. Mond. Responses of marginal zone and follicular B cells. Comparative in vitro analysis of proliferation, Ig secretion, and Ig class switching by murine marginal zone and follicular B cells. *J. Immunol.* 150:2737, 1993.
13. Pecanha, L.M.T., H. Yamaguchi, A. Lees, R.J. Noelle, J.J. Mond, and C.M. Snapper. Dextran-conjugated anti-IgD antibodies inhibit T cell-mediated IgE production but augment the synthesis of IgM and IgG1. *J. Immunol.* 150:2160, 1993.
14. Yamada, H., C.H. June, F.D. Finkelman, M. Brunswick, M.S. Ring, A. Lees, and J.J. Mond. Persistent calcium elevation correlates with the induction of sIg-mediated B cell DNA synthesis. *J. Exp. Med.* 177:1613, 1993.
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16. Khilko, S.N., M. Corr, L.F. Boyd, A. Lees, J.K. Inman, and D.H. Margulies. Direct detection of MHC class I peptide binding to antigenic peptides using surface plasmon resonance. Peptide immobilization and characterization of binding specificity. *J. Biol. Chem.* 268:15425, 1993.
17. Morris, S.C., A. Lees, J.M. Holmes, R.D.A. Jeffries, and F.D. Finkelman. Induction of B cell and T cell tolerance in vivo by anti-CD23 mAb. *J. Immunol.* 152:3768, 1994.
18. Morris, S.C., A. Lees, and F.D. Finkelman. In vivo activation of naive T cells by antigen-presenting B cells. *J. Immunol.* 152:3777, 1994.
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21. Lujan, H.D., M.R. Mowatt, J. Wu, Y. Lu, A. Lees, M.R. Chance, and T.E. Nash. Purification of a variant-specific surface protein

- of *Giardia lamblia* and characterization of its metal-binding properties. *J. Biol. Chem.* 270:13807, 1995.
22. Mond, J.J., A. **Lees**, and C.M. Snapper. T cell-independent antigens type 2. *Ann Rev. Immunol.* 13:655, 1995.
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 27. Cassels, F.J., D.L. Harboe, R.H. Reid, A. **Lees**, and C.D. Deal. Linear epitopes of colonization factor antigen I and peptide vaccine approach to enterotoxigenic *Escherichia coli*. *J. Ind. Microbiol. Biotech.* 19:66, 1997.
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 32. Shafer, D.E., B. Toll, R.F. Schuman, B.L. Nelson, J.J. Mond and A. **Lees**. Activation of soluble polysaccharides with CDAP for use in protein-polysaccharide conjugate vaccines and immunological reagents. II. Selective crosslinking of proteins to CDAP-activated polysaccharides. *Vaccine.* 18:1273, 2000.

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43. Cunto-Amesty, G., P. Luo, B. Monzavi-Karbassi, A. **Lees**, J. Alexander, M.-F. Del Guercio, M. Nahm, C. Artaud, J. Stanley and T. Kieber-Emmons. Peptide mimotopes as prototypic templates of broad-spectrum surrogates of carbohydrate antigens. *Cell Mol Biol.* 49:245, 2003.
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49. Lopez-Acosta, A., G. Sen and A. **Lees**. Versatile and efficient synthesis of protein-polysaccharide conjugate vaccines using aminoxy reagents and oxime chemistry. *Vaccine*, 24:716, 2006.
50. Ghochikyan A, Petrushina I, **Lees A**, Vasilevko V, Movsesyan N, Karapetyan A, Agadjanyan MG, Cribbs DH. A β -immunotherapy for Alzheimer's disease using mannan-amyloid-Beta peptide immunoconjugates. *DNA Cell Biol.* 25:571, 2006
51. Burkhardt, M., A. Lopezacosta, K. Reiter, V. Lopez and **A. Lees**. Purification of soluble CD14 fusion proteins and use in an electrochemiluminescent assay for lipopolysaccharide binding. *Protein Exp. Purif.*, 51:96, 2007.
52. **Lees, A.**, V. Puvanesarajah and C.E. Frasch. Conjugation Chemistry. Pps 163-174 *Pneumococcal Vaccines: The Impact of Conjugate Vaccines*. Eds G.R. Siber, K.P. Klugman and P.H. Makela. ASM Press, Washington DC. 2008.
53. Datta, K, **A. Lees**, LA. Pirofski. Therapeutic Efficacy of a Conjugate Vaccine containing a Peptide Mimotope of the *Cryptococcal* Capsular Polysaccharide Glucuronoxylomannan (GXM). *Clin. Vaccine Immunol.* 8:1176, 2008.
54. Petrushina I, Ghochikyan A, Mkrtychyan M, Mamikonyan G, Movsesyan N, Ajdari R, Vasilevko V, Karapetyan A, **Lees A**, Agadjanyan MG, Cribbs DH. Mannan-Abeta28 conjugate prevents Abeta-plaque deposition, but increases microhemorrhages in the brains of vaccinated Tg2576 (APPsw) mice. *J Neuroinflam.* 5:42, 2008.
55. Burkhardt, M., C. Sei, **A. Lees**, J. Mond. A rapid opsonic assay for measuring killing of bioluminescent *Staphylococcus epidermidis*. *Hybridoma*, 27:487, 2008.

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ABSTRACTS

1. Conrad, D.H., **A. Lees**, F.D. Finkelman, C.M. Squire, and K.A. Campbell. Structure and function of the murine B lymphocyte low affinity receptor for IgE. Miami Winter Symposia, "Advances in Gene Technology" 1990.
2. Yamada, H., C.H. June, **A. Lees**, E.D. Anastassiou, F.D. Finkelman, and G.C. Tsokos. Signal transduction in human B cells by crosslinking of complement receptor 2 (CR2) and simultaneous crosslinking of CR2 and surface IgM (sIgM). *FASEB J.* 4:A1721, 1990.
3. Tsokos, G. C., E. D. Anastassiou, **A. Lees**, F. D. Finkelman, C. H. June, and H. Yamada. Signal transduction in human B cells by a monoclonal antibody to complement receptor 2 (HBS) coupled to dextran. *FASEB J.* 4:A1698, 1990.
4. **Lees**, A., S. Morris, J. Holmes, J. Inman, and F.D. Finkelman. Induction of large, rapid specific antibody responses with antigen-anti-IgD antibody conjugates. *FASEB J.* 4:A1804, 1990.
5. Campbell, K.A., **A. Lees**, F.D. Finkelman, and D.H. Conrad. Crosslinking of Fc ϵ RII and surface IgD enhances anti-IgD mediated B cell activation. *FASEB J.* 5:A609, 1991
6. Squire, C.M., **A. Lees**, F.D. Finkelman, and D.H. Conrad. Enhanced antigen presentation by targeting antigen to Fc ϵ RII (CD23) on B cells using antigen anti-Fc ϵ RII conjugates. *FASEB J.* 5:A721, 1991.
7. Snapper, C.M., T.M. McIntyre, R. Mandler, L.M.T. Pecanha, F.D. Finkelman, **A. Lees**, and J.J. Mond. Induction of IgG3 secretion by IFN- γ A model for T-independent class switching in response to TI-2 antigens. *FASEB J.* 6:A1132, 1992.
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9. Morris, S.C., **A. Lees**, and F.D. Finkelman. Induction of an in vivo antibody response by CD23-bound ligand. *FASEB J.* 6:A2003, 1992.
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11. **Lees, A., F.D. Finkelman, J.K. Inman, P. Johnson, and J.J. Mond.** Enhanced immunogenicity of protein-dextran conjugates. 8th Int. Congress of Immunol., Budapest, Hungary, 1992. p. 563.
12. Gupta, R.K., A. **Lees**, J.J. Mond, and G.R. Siber. Conjugation of multiple copies of T-cell dependent antigens on a large molecular weight polysaccharide carrier enhances antibody responses to both components. Vaccine Technology, Alexandria, VA, May 1994.
13. Cassels, F.J., D.L. Jarboe, R.H. Reid, A. **Lees**, and C.D. Deal. Linear epitopes of CFA/I and cross-reactivity between members of the CFA/I family of enterotoxigenic *E. coli* fimbriae. Gordon Research Conference on Molecular Mechanisms of Bacterial Adhesion and Signaling, Newport, RI, Aug 1997.
14. Taubman, M.A., C.J. Holmberg, B-Y. Ma, D.J. Smith, and A. **Lees**. Immunogenicity of glucan synthesized by Mutans Streptococcal glucosyltransferase. Am. Ass. Dental Res. Minneapolis. March 1998.
15. **Lees, A., D.E. Shafer, R.F. Schuman, B. Toll, M. Bash, and J.J. Mond.** Protein-polysaccharide conjugate vaccines produced using haloacylated polysaccharides and unmodified protein. 3rd National Symposium on Basic Aspects of Vaccines. April 1998.
16. Taubman, M.A., D.J. Smith, C.J. Holmberg, B-Y. Ma, D. Shafer and A. **Lees**. Protein-polysaccharide conjugates as potential caries vaccines. Int. Ass. Dental Res., Nice, Fr. May 1998.
17. **Lees, A., D.E. Shafer, R.F. Schuman, B. Toll, M. Bash, and J.J. Mond.** Protein-polysaccharide vaccines produced using haloacylated polysaccharides and unmodified protein. 11th International Pathogenic Neisseria Conference, Nov. 1998, Nice France.
18. Shafer, D.E., R.F. Schuman, B. Toll, J.J. Mond and A. **Lees**. Conjugate vaccines containing free protein. Pneumococcal Vaccines for the World. Washington, D.C., Oct 1998.
19. Shafer, D.E., R.F. Schuman, J.J. Mond and A. **Lees**. Rapid and low cost processing of conjugate vaccines to remove unconjugated protein. Basic Aspects of Vaccines. Bethesda, MD. April 1999.
20. Taubman, M.A., D.J. Smith, C.J. Holmberg and A. **Lees**. GTF-S. *Sobrinus* polysaccharide conjugates as potential caries vaccines. Int. Assoc. Dental Research, Vancouver, Spring 1999.
21. Pletveva, L, D.E. Shafer, G.A. Prince and R.J. Langley. Cloning, sequencing and expression of the cotton rat interleukin 1 alpha gene. RSV Symposium, Nov., Indian River, FL 1999.
22. Taubman, M.A., D.J. Smith, C.J. Holmberg and A. **Lees**. Effect of immunization route on isotype of antibody to glucosyltransferase-polysaccharide conjugate. Int. Assoc. Dental Research, Wash. D.C., Spring 2000.

23. Fleuridor, R. A. **Lees** and L. Pirofski. A mimetic of glucuronoxylomannan (GXM) epitope elicits antibodies to GXM in mice. Am Soc. Microbiol. Los Angeles, Spring 2000.
24. Zhong, Z., Q. Chang, A. **Lees** and L. Pirofski. Human Anti-pneumococcal antibodies produced by XenoMouse mice prolong survival of mice with lethal pneumococcal infection. Am Soc. Microbiol. Los Angeles, Spring 2001.
25. Maitta, R.W., A. **Lees** and L. Pirofski. A monoclonal antibody from human immunoglobulin transgenic mice protects against Cryptococcus neoformans challenge. IAAC, 2003.
26. Buchwald, U.K., B. Witover, A. **Lees** and L. Pirofski. Vaccination with a peptide mimotope of S. pneumoniae serotype 8 capsular polysaccharide protects Balb/c mice against a systemic pneumococcal infection. Am Soc Microbiol. Washington DC, Spring 2003.
27. Taubman, M. A., Smith, D.J. and A. **Lees**. Preparation and immunogenicity of monoepitopic and polyepitopic tetanus toxoid – glucosyltransferase peptide conjugate vaccines. Int. Assoc Dental Research. June 2003.
28. Cribbs, D.H., A. **Lees**, T. Saing, A.K. DeVolger, I. Petrushina, V. Vasilevko, N. Sadzikava and M.G. Agadjanyan. Mannan as a molecular adjuvant for AB immunotherapy. 6th Int Conference AD/PD, Spring, 2003.
29. **Lees**, A., A. Topping, A. Razzaq and J.J. Mond. Purification and scale-up of E. coli recombinant lysostaphin using hydrophobic charge induction chromatography. Prep 2005. Philadelphia, PA. May 2005.
30. KoKai-Kun, J, A. LopezAcosta, J. Acevedo and A. **Lees**. Lipoteichoic acid conjugate vaccine for staphylococcus. 8th Annual Conference on Vaccine Research. Baltimore, MD. May 2005.
31. **Lees**, A. and A. LopezAcosta. Aminoxy reagents and oxime chemistry for the preparation of conjugate vaccines. 8th Annual Conference on Vaccine Research. Baltimore, MD. May 2005.
32. **Lees**, A. and D. E. Shafer. Reducing the cost of manufacturing conjugate vaccines: Effective alternatives to gel filtration. 8th Annual Conference on Vaccine Research. Baltimore, MD. May 2005.
33. Burkhardt, M., D. Schaffner and A. **Lees**. Mixed Mode Chromatography in the purification of Recombinant Proteins. Prep 2007. Baltimore, MD 2007.
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PATENTS ISSUED

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3. **Lees**, A., Coupling of unmodified proteins to haloacyl or dihaloacyl derivatized polysaccharides for the preparation of protein-polysaccharide vaccines. U.S. Patent #6087328. Issued July 11, 2000.
4. **Lees**, A. and J.J. Mond. Process for preparing conjugate vaccines including free protein and the conjugate vaccines, immunogens, and immunogenic reagents produced by this process. US Patent #6,248,334. Issued June 19, 2001; US Patent #6756041. Issued June 29, 2004.
5. **Lees**, A. and D.E. Shafer. Simplified method for removing free protein during the preparation of protein-polysaccharide conjugates and vaccines using restricted access media. US Patent #6,284,250. Issued Sept. 4, 2001.
6. **Lees**, A. Uronium salts for activating hydroxyls, carboxyls and polysaccharides, and conjugate vaccines, immunogens, and other useful immunological reagents produced using uronium salts. US Patent #6,299,881. Issued Oct. 9, 2001.
7. **Lees**, A. Protein-polysaccharide conjugate vaccines and other immunological reagents prepared using homobifunctional and heterobifunctional vinylsulfones and processes for preparing the conjugates. US Patent # 6,309,646. Issued Oct 30, 2001.
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9. **Lees**, A. Method for preparing solid phase conjugated vaccines. US Patent #6,585,973. Issued July 1, 2003.
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