

**SAMUEL A LEWIS**  
CURRICULUM VITAE

**SUMMARY**

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- Senior, hands-on biotechnologist with domestic and international industry experience.
- Proficient in the following areas:
  - ❖ Virology/Cell-culture including BSL-3/4 work (cultivation of over 70 pathogens)
  - ❖ Vaccine development and production
  - ❖ Protein expression, purification, and characterization (over 75 proteins)
  - ❖ Diagnostic assay development: antigen and nucleic acid tests
  - ❖ Extensive small animal work
  - ❖ cGMP (USDA); cGLP (FDA)

**EDUCATION**

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**1981-87** Johns Hopkins University, School of Medicine, Dept. of Pharmacology / Ph.D.  
**1976-81** University of California, Davis. Biochemistry major / B.S.

**WORK EXPERIENCE**

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**2011 – present**     **PathoLase, Inc.**     **Chico, CA**  
Positions held: 1) Director, Microbiology  
Major projects: • Setup and ran a BSL-2 microbiology lab  
• Developed molecular assays for the major causes of onychomycosis  
• Development of a product for removal of foot fungi

**2007-2011**     **Calypte Biomedical / Sedia Biosciences**     **Portland**  
Positions held: 1) Director, Molecular Biology  
Major projects: • Setup and ran a molecular-biology / protein-purification lab  
• Developed reagents for HIV, HCV and influenza detection  
• Development of a POC, LAMP assay for HIV

**2003-07**     **ACON Labs**     **San Diego**  
Position held: 1) Scientist. Head, Molecular Biology Section  
Major projects: • Setup and ran a molecular-biology / protein-purification lab for IVD components  
• Cloned, expressed, purified, and tested over 60 infectious disease proteins  
• Developed an isothermal PCR-like test to detect 10 copies of DNA/RNA  
• Advised scientists at our sister company in China on: molecular biology, PCR, ELISA, protein stability, etc.

**2001-02**     **NAMRU-3 (U.S. Naval Medical Research Unit #3)**     **Cairo**  
Positions held: 1) Head, Molecular Biology Section, Virology Program  
2) Consultant (see below, 1993-8/02)  
Major projects: • Developed and used PCR assays for diagnosis of viral infections  
• Cloned and expressed flavivirus proteins (with dpInternational)  
• Developed a wick test for Rift Valley Fever (with Noventis)

**1999-01**     **NAMRU-3**  
Positions held: 1) Head, Virology and Tissue Culture Section, Virology Program  
2) Consultant (see below)

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- Major projects:
- Setup and ran a laboratory for isolation of respiratory viruses from Egypt, Oman, and Syria
  - Setup and ran a field lab in Yemen during a Rift Valley Fever outbreak
  - Developed and setup assays for diagnosis of several BSL-3 viruses

**1993-8/02 NAMRU-3**

Positions held: 1) Head, Biotechnology Section, NAMRU-3  
2) Consultant to the Egyptian Reference Diagnostic Center (ERDC)

- Major projects:
- Established a GLP-like system at the ERDC
  - Developed and tested potential recombinant schistosome vaccines
  - Conducted animal safety testing of two schistosome vaccines
  - Identification of *Campylobacter* virulence factors
  - Assisted in the establishment of molecular biology laboratories in Egypt

**1990-93 ImmuCell**

**Portland, ME**

Position held: 1) Sr. Scientist

- Major projects:
- Developed and produced rotavirus and coronavirus vaccines (cGMP)
  - Used bovine milk antibodies for prevention of diarrheal diseases
  - Expressed and tested *Cryptosporidium* genes for use as a vaccine

**1988-90 USDA, Plum Island Animal Disease Center**

**Greenport, New York**

Position held: 1) Fellow

- Major projects:
- Developed a recombinant FMD empty-capsid vaccine in baculovirus and *E. coli*
  - Determined the coding assignments of orbivirus RNAs (bluetongue, African horsesickness, and epizootic hemorrhagic disease)
  - Conducted structural studies on bluetongue virus

**<1988**

**Johns Hopkins:** (All basic research) Studied the release of proteins from adult schistosomes; Isolated and characterized cytomegalovirus dense bodies; Isolated the ATPase activity from nuclear pore complexes.

**U.C. Davis:** Antibody response to synthetic peptides from tobacco mosaic virus

**Syntex:** Introduced 2'-5' polyadenylic acid into cells; Determined the anti-tumor activity of MDP (muramyl dipeptide) delivered in liposomes

**TECHNICAL SKILLS**

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Hands-on experience with the following techniques:

\* Virology/Cell-culture:

- Propagation of picornaviruses, a coronavirus, orbiviruses, herpesviruses, rotaviruses, paramyxoviruses, orthomyxoviruses, flaviviruses, bunyaviruses, and a poxvirus.
- Supporting techniques including TCID<sub>50</sub>, plaque assays, fluorescent focus assays, purification, hemagglutination
- Production of monoclonal antibodies

\* Protein expression in yeast, baculovirus and bacteria

\* Extensive work with proteins including:

- Electrophoresis: 2-d electrophoresis, native systems, western blotting, and peptide mapping
- Purification: Size, ion exchange, and immunoaffinity chromatography, FPLC, HPLC.
- Characterization: epitope mapping, stability testing, etc.

\* Extensive work with antibodies including:

- ELISA assay development (several systems)
- Purification of monoclonal and polyclonal antibodies

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- \* Extensive work with laboratory animals including guinea pigs, rats, hamsters, rabbits, goats, and mice (Chairperson, Animal Care and Use Committee, NAMRU-3)
- \* Light and electron microscopy
  - Ultrathin frozen sectioning and immunogold labeling
  - Immunofluorescent microscopy including fluorescent focus assays and cryosectioning
- \* Basic DNA cloning techniques
- \* Other biochemical and cell biology techniques including TLC, cell fractionation, protein labeling

#### FUNDED GRANTS

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1. Serodiagnosis of Individual Flavivirus Infections Including: West Nile, Hepatitis G and hepatitis C. 2001. \$50,000 (Principal Investigator)
2. Nucleic Acid Vaccine for Foot and Mouth Disease Virus. 1998. \$50,000 (Principal Investigator)
3. *Haemophilus Influenza type B*/ Tetanus Toxoid Conjugate Vaccine. 1998. \$30,000 (Associate Investigator)
4. Identifying *Cryptosporidium* Protective Antigen Genes. 1991. \$100,000 (Principal Investigator)

#### OTHER

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- Chairperson, Animal Care and Use Committee, NAMRU-3. 1999-2002.
- IRB member. 1997-2001. NAMRU-3

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## PUBLICATIONS

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-El Ridi R, Ragab S, Lewis S, Afifi A. Role of IgE in primary murine Schistosomiasis mansoni. Scand J Immunol. 2001 Jan;53(1):24-31.

-Grubman M.J., Lewis S.A., and Morgan D.O., 1993. Protection of swine against foot-and-mouth disease with viral capsid proteins expressed in heterologous systems. Vaccine, 11:825-829.

-Grubman, M.J and Lewis S.A., 1992. Identification and characterization of the structural and nonstructural proteins of african horsesickness virus and determination of the genome coding assignments. Virol., 186:444-451.

-Lewis S.A., Morgan D.O., and Grubman, M.J., 1991. Expression, processing, and assembly of foot and mouth disease virus capsid structures in heterologous systems: induction of a neutralizing antibody response in guinea pigs. J. Virol., 65:6572-6580.

-Lewis, S.A. and Grubman, M.J., 1991. VP2 is major exposed protein on orbiviruses. Arch. Virol. 121:233-236.

-Lewis, S.A. and Grubman, M.J., 1990. Bluetongue virus-17: Surface exposure of VP7. Virus Res., 16:17-26.

-Lewis, S.A., and Strand, M., 1991. Characterization of proteins and immunogens released by adult *Schistosoma mansoni*. J. Parasitol. 77(2):263-271.

-Dalton J.P., Lewis S.A., Aronstein W.S., and Strand M., 1987. *Schistosoma mansoni*: Immunogenic glycoproteins of the cercarial glycocalyx. Exp. Parasitol., 63:215-226.

-Aronstein, W.S., Lewis, S.A., Norden, A.P., Dalton, J.P., and Strand, M., 1986. Molecular identity of a major antigen of *Schistosoma mansoni* which cross-reacts with *Trichinella spiralis* and *Fasciola hepatica*. Parasitol., 92:133-151.

-Strand, M., Aronstein, W.S., Norden, A.P., Lewis, S.A., and Weiss, J.B., 1984. *Schistosoma* worm proteins: Composition and immunoreactivity. "The Third John Jacob Abel Symposium on Molecular Parasitology". (J.T. August, Ed.), Academic Press, New York.

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