PROFESSIONAL ACTIVITIES

Director of Business Development, DHMRI

- Implemented a multidisciplinary approach to project planning: *From design to implementation to interpretation - every available resource will be utilized to provide the most cost-effective solutions and highest-quality results.…*
- Organized teams representing the different disciplines within the DHMRI to educate, challenge, and assist investigators to apply the most relevant, far-reaching, and latest technologies to their research programs.
- Spearheaded the creation of the Center for Critical Path Research in Immunology (CCPRI) at DHMRI with projected revenues to exceed $7M in three years.
- Planned and implemented the DHMRI/Zeiss Partnership that established the DHMRI as a microscopy center of excellence. Highlights include an in-house Zeiss (Ph.D.) specialist, regularly held workshops and conferences, co-marketing activities, and the establishment of DHMRI as a beta-test center.
- Created Business Development team that has established customer base within academia, industry and government.
- Negotiated refinancing of over $10M with Zeiss, JEOL, TECAN, and ThermoElectron during economic downturn.
- Collaborated with campus scientists on grants incorporating DHMRI services and capabilities.
- Participated in creating the original DHMRI website. The DHMRI website was honored with a Gold Create Award for its creative excellence. Other activities include coordinating press releases and press conferences for DHMRI.
- Established a collaborative effort with UNC Charlotte Broadcast Communications to produce an HDTV series depicting DHMRI capabilities.

Consulting, DHMRI

- Designed and up fitted the microscopy imaging laboratory and completed the purchase of the most sophisticated and integrated microscopy systems available leading to the largest single transaction by any institute with Carl Zeiss Microimaging.
- Negotiated and purchased over $30 million in scientific equipment.

Consulting, RTI (DHMRI Project)

- Contributed to the design and up fit of 80,000 sq ft of laboratory space for the David H. Murdock Research Institute including the specification and selection of over $30 million in capital equipment for Proteomics, Metabolomics, Genomics,

Flow Cytometry, Microscopy, Cryo-Electron Microscopy, Tissue Culture, Transgenics and support services.
- Participated in the development of Duke University's MURDOCK study (Measurement to Understand the Reclassification of Disease of Cabarrus/Kannapolis) that incorporates the multidisciplinary capabilities of DHMRI (genomics, proteomics, metabolomics, bioinformatics, etc.) with the transdisciplinary challenges (healthcare, bioethics, epidemiology, social concerns, etc.) of screening and recruiting appropriate groups of patients.

President and Founder, Hybrizyme Corporation
- Designed and up fitted laboratory
- Established business, operating, and regulatory infrastructure
- Implemented contracting procedures to secure NIH contracts and grants
- Invented and developed a cost-effective assay system based on the Aryl hydrocarbon receptor and PCR that can measure dioxins down to a few ppt with a relative standard deviation better or equal to High Resolution MS/GC costing $1000 per sample
- Invented and developed assays detecting nuclear receptors and transcription factors such as the estrogen receptor, HIF-1α, AP1 (c-fos), and SP1 with 100 to a 1000 times more sensitivity than current technologies
- Secured licensing and OEM manufacturing agreements with U.S. and international companies resulting in almost $1 million in seed instrumentation and licensing fees
- Obtained $1.15 million in SBIR funding
- Participated in the validation of products in the U.S., Europe, Japan, and China
- Presented papers at international meetings as a participant and invited speaker

EnSys, Inc.
- Participated in the design and construction of EnSys facilities including the Analytical Chemistry, Immunology, and Product Development laboratories
- Planned laboratory layout and designed bench configurations
- Negotiated with vendors and purchased laboratory furniture, equipment and service contracts in excess of $2 million
- Staffed and managed the Immunology group
- Developed reagents including monoclonal antibodies for field portable assays used to detect TCDD, PCBs, PAHs, PCPs, benzene and other small molecules
- Contributed to the development of the validation protocols now used by the U.S. EPA for the approval of all immunoassays within SW846
- Participated in the validation of all EnSys products

- Oversaw the MITA instrument development program which consisted of a microprocessor-equipped multiple wavelength reflective spectrophotometer optimized for use in membrane based immunoassays

NIH Senior Staff Fellow

- Discovered novel heat-shock protein in heat-sensitive spermatogenic cells
- Produced monoclonal antibody to examine heat-shock proteins involved in reproductive development

Graduate Assistant, ORNL School of Biomedical Sciences

- Developed monoclonal antibodies to detect unique proteins associated with basic cellular functions such as DNA replication
- Investigated chromatin structure using state-of-the-art fluorescent, phase contrast, and transmission electron microscopy

Supervisor, Immunopathology Laboratory, Department of Pathology, Michigan State University

- Established and directed the Clinical Immunopathology Laboratory
- Developed and validated immunoassays for autoimmune-related diseases
- Trained medical students and pathology residents in clinical immunopathology instrumentation and procedures

Research Assistant, Reproductive Physiology Laboratory and School of Veterinary Medicine, North Carolina State University

- Established mouse chimera laboratory
- Examined the response of guinea pigs to systemic and cutaneous anaphylaxes
- Developed a method for isolating large quantities of purified eosinophils from horses experimentally infected with Trichinilla spiralis

Architectural Design and Construction, North Carolina State University

- Acquired 20 hours training in engineering graphics, architecture, and construction

FELLOWSHIP, GRANTS, AND AWARDS

1989 – 2000 PI, SBIR Phase I (1989) $50,000 NCI; PI, SBIR Phase I (1995) $100,000 NIEHS; PI, NCBC Bridge Loan (1996) $50,000; PI, SBIR Phase II (1997) $750,000 NIEHS; PI, NCBC Research Loan (2000) $100,000;

	PI, SBIR Phase I (2000) $100,000; PI, CRADA USDA; PI, CRADA US-EPA
1988 – 1989	NIH Senior Staff Fellowship, Nation Institute of Environmental Health Sciences
1985 – 1988	NIH Staff Fellowship, National Institute of Environmental Health Sciences
1982 – 1985	NIH Training in Genetics Grant, The University of Tennessee, Oak Ridge Graduate School of Biomedical Sciences
1981 – 1982	Graduate Assistant Scholarship, The University of Tennessee, Oak Ridge Graduate School of Biomedical Sciences
1979 – 1981	Graduate Assistant, Animal Health Diagnostic Laboratory and Department of Pathology, Michigan State University

PATENTS ISSUED AND PENDING

- A Polyaromatic Hydrocarbon (PAH) Immunoassay Method, Its Components and a Kit For Use in Performing The Same(U.S. 5,618,681 and U.S. 5,449,611)
- A Petroleum Immunoassay Method, Its Components and a Kit for use in Performing the same (U.S. 5,691,148)
- A PCB Immunoassay Method, Its Components and a Kit for use in the same (U.S.5,834,222)
- An Immunoassay Method for Detecting Benzene an Immunologically Unremarkable Compound, Its Components and a Kit for use in the same (U.S. 5,484,709)
- PCB Immunoassay Method, Its Components and a Kit for use in the same (U.S. 5,858,962)
- Receptor Capture Assay, U.S. Patent Pending
- Receptor Capture Assay E.U. (WO2004001371; Australia 2002367937; Canada, Pending; Japan, Pending; China, Pending)
- Receptor Capture Assay for Diagnosis, Patent Pending

LICENSES AND AGREEMENTS

- Northwestern University, Ah-Receptor, Patents and technology (Worldwide)
- Wallac Oy (PerkinElmer Life Sciences), DELFIA Chemistry and Instrumentation, Patents and technology (Worldwide)
- Wallac Oy (PerkinElmer Life Sciences), OEM Agreement (Worldwide)
- Strategic Diagnostics Inc., Antibodies, Licensing, Service, and Supply Agreement (Worldwide)

- Tomen Corporation, Distribution and R&D Agreement (Japan)
- EnChem, Distribution Agreement (China)
- EnChem, Distribution Agreement (EPA Region 5, USA)
- Eichrom Technologies, License and Supply Agreement (US and Europe)

VALIDATIONS AND SPECIAL PROJECTS

- US EPA, Environmental Technology Verification Report, Validating Hybrizyme's DELFIA PCB Assay (http://www.epa.gov/etv/pdfs/vrvs/01_vr_hybrizyme.pdf)
- European Commission, Joint Research Centre, Ispra, Italy, Validating Hybrizyme's DEFIA Assay for detecting PCBs in Food
- European Commission, Joint Research Centre, Brussels, Belgium, Validating Hybrizyme's DEFIA Assay for detecting Dioxins in Food
- US Navy, Mapping of Pearle Harbor using Hybrizyme's AhRC PCR Dioxin Assay
- University Peking, China, Certifying a laboratory to test food samples for dioxins and furans using Hybrizyme's AhRC PCR Dioxin Assay
- U.S. EPA, Innovative Technology Verification Report, Validating Hybrizyme's AhRC PCR Assay for Dioxins (http://www.epa.gov/ORD/SITE/reports/540r05005/540r05005.pdf)
- CRADA No. 0174-99, USEPA, Determination of Binding Affinities of Dioxins to Ah Receptors with EPA-NHEERL-RTP
- CRADA No. 58-3K95-M-410, USDA, Detection of Dioxins in Certain Food
- U.S. EPA SW-846 Acceptance: Method 4430 Screening for Polychlorinated Dibenzo-p-dioxins and Furans (PCDD/Fs) by Aryl Hydrocarbon-receptor PCR Assay (http://www.epa.gov/epaoswer/hazwaste/test/new-meth.htm#4430).

PUBLICATIONS

- Allen, R.L. and Olins, D.E.: Cytochemistry of the chromatin replication band in hypotrichous ciliated protozoa staining with silver and thiol-specific coumarin maleimide. Chromosoma 91: 82-86, 1984.
- Allen, R.L., Olins, A.L., Harp, J.M., and Olins, D.E.: Isolation and characterization of chromatin replication bands and macronuclei from Euploties eurystomus. Eur. J. Cell Biol. 39: 217-223, 1985.
- Allen, R.L., Kennel, S.J., Cacheiro, L., Olins, A.L., and Olins, D.E.: Examination of the macronuclear replication band in Euplotes eurystomus with monoclonal antibodies. J. Cell Biol. 102: 131-136, 1986.

- Allen, R.L., O'Brien, D.A., and Eddy, E.M.: A novel Hsp70-like protein (P70) is present in mouse spermatogenic cells. Mol. Cell. Biol. 8: 828-832,1988.
- Allen, R.L., O'Brien, D.A., Jones, C.C., Rockett, D.L., and Eddy, E.M.: The expression of heat shock proteins by isolated mouse spermatogenic cells. Mol. Cell. Biol. 8: 3260-3266, 1988.
- Maekawa, M., O'Brien, D.A., Allen, R.L., and Eddy, E.M.: Heat-shock cognate protein (hsc71) and related proteins in mouse spermatogenic cells. Biol. Reprod. 40: 843-852, 1989.
- Rosario, M.O., Perkins, S.L., O'Brien, D.A., Allen, R.L., and Eddy, E.M.: Heat shock cDNAs isolated with the antiserum recognizing the P70 protein of mouse spermatogenic cells. Dev. Biol, Vol 150, No 1, pp. 1-11, 1992.
- Mapes, J.P., McKenzie, K.D., McClelland, L.R., Movassaghi, S., Reddy, R.A., Allen, R.L., and Friedman, S.B.: Penta RISc soil- a rapid, on-site screening test for PCP in soil. Bull Environ Contam Toxicol, Vol. 49, No. 3, pp. 334-41, 1992.
- Allen, R.L., Manning, W.B., McKenzie, K.D., Mapes, J.P., and Friedman, S.B.: Development of a monoclonal antibody Immunoassay for the detection of gasoline and diesel fuel in the environment. Proceedings of the Hydrocarbon Contaminated Soils Conference, Lewis Publishers, Chelsea, Mi. 37 – 46, 1992.
- Allen, R.L., Stewart, T.N., Reynolds D.L., Friedman, S.B.: Rapid and Cost-Effective Analysis of 2,3,7,8-TCDD Using The "Dioxin Risc" Test Kit. Submitted.
- Withers, T., Almond, R., Friedman, S., Stewart, T., Allen, R.L.: Benzene Risc: An Immunoassay for Detecting 500 Parts per Billion Benzene in Water. Journal of clinical Ligand Assay, Vol. 18, No. X, pp. 1-5, 1995.
- Jaborek-Hugo, S., von Holst, C., Allen, R., Stewart, T., Willey, J., Anklam, E.: Use of an immunoassay as a means to detect polychlorinated biphenyls in animal fat. Food Additives and Contaminants, Vol. 18, No 2, pp. 121-127, 2001.
- Yu, J., Nestric, T.J., Allen, R.A., Savage, P.E.: Microcontaminants in Pentachlorophenol Synthesis. 1. New Bioassay for Microcontaminant Quantification. Ind. Eng. Chemical Research, Vol 45, No 15, pp. 5199-5204, 2006.
- McAlister, D.R., Fern, M.J., Allen, R.A.: Rapid aryl hydrocarbon receptor based polymerase chain reaction screening assay for polychlorinated dibenzo-p-dioxins and furans in soil and sediment. Talanta, Vol. 74, No. 4, pp. 992-997, 2008.

EDUCATION

1985 - Ph.D.	Biochemistry, Oak Ridge National Laboratory, University of Tennessee Oak Ridge Graduate School of Biomedical Sciences
1981 - M.S.	Pathology, Michigan State University
1979 - B.S.	Zoology, North Carolina State University

POSITIONS

2006 - Cur	**David H. Murdock Research Institute (DHMRI)**
	2008 - Cur. Director of Business Development, DHMRI
	2007 – 2008 Consultant to DHMRI
	2006 – 2007 Consultant to DHMRI; Contractor: Research Triangle Institute (RTI)
1995 – 2007	**Hybrizyme Corp., Raleigh, North Carolina**
	CEO and Chairman of the Board
1989 - 1995	**EnSys Inc., Research Triangle Park, North Carolina**
	1994 – 1995 Director of Product Development, EnSys Inc.
	1991 – 1994 Director of Immunology, EnSys Inc.
	1989 – 1991 Senior Scientist, EnSys Inc.
1985 - 1989	**NIH Senior Staff Fellow**
	Gamete Biology Section, Laboratory of Reproductive and Developmental Toxicology, National Institute of Environmental Health Sciences, NIH, Research Triangle Park, North Carolina
1979 - 1981	**Supervisor, Assay Development and Immunopathology**
	Department of Pathology, Michigan State University
1979 – 1980	**Research Assistant, Immunology**
	Department of Veterinary Medicine, North Carolina State University, Raleigh, North Carolina