

This document provides:

- (1) Brief statements about some recent and ongoing activities, including NIH grants and other projects in process, mainly through a few excerpts from abstracts of papers/books in progress.
- (2) A summary of capabilities and interests with respect to a professional working situation.
- (3) A listing of a few colleagues and prior clients who can provide references and recommendations.

## 1. Current and Recent Activities

### 1.1 Clinical Trials and Field Testing

Protocol for antimicrobial preventive treatment and monitoring against HA and CA MRSA and related resistant infectious diseases. Incorporates the application of organo-silane polymers (currently in wide use) within and on high-contact, high-exchange surfaces and materials, a regimen of monitoring and retesting, plus a population informatics and education methodology. Planning is well underway.

### 1.2 The “MRSA-Plus” Book

Pertaining to infectious diseases and the changing dynamics of public lifestyles and health patterns. Designed to serve multiple audiences of readers in different levels; principally for the educated general reader who is also in some type of administrative, decision-making profession that relates to health care or the management of programs that involve health care, such as for schools, offices, sports, transportation carriers, factories, and other facilities.

### 1.3 Rapid, Non-invasive, Portable, Field-Ready Hydration Monitoring

For Dept. of Defense and also sports medicine and general community public health usage. Focused upon an innovative saliva-based sampling method.

### 1.4 A Mechanism for Detecting Trigger Points and Irreversibility Thresholds in Shock and Trauma for Catastrophic Events

**Abstract.** We investigate the model of unstable recurrent patterns that emerge within chaotic and highly turbulent systems as a possible avenue for linking shifts in clinical parameters that can be indicators of nonlinear and irreversible transitions leading to mortality. The argument presented is that in the case of mass injury and trauma events from natural or intentional causes, large numbers of people may be in situations where clinical testing infrastructures have been disabled or destroyed, further reducing the ability of medical caregivers to accurately notice indicators and signals of impending critical and irreversible conditions. Identification of a reduced set of observables that can be linked with unstable yet recurrent patterns may provide a means for improved monitoring and life support under such adverse conditions.

### 1.5 Cell membrane and cytoplasmic signaling, communications and epigenetics

A model is presented as the basis for answering some questions pertaining to the instantiation and triggering of epigenetic actions including histone-binding regulation of DNA. The model is based upon the hypothesis that cellular surface actions analogous to massively parallel systolic computations (“surface computing”) effect and modulate communications via actin and intermediary filaments, including mechanotransduction effects, to the microtubulin-based cytoskeleton and that the structure dynamics of the cytoskeleton act as both a molecular memory bank or accumulator, modifying over time as a result of continued signaling from such cell surface processes and changes in cytoplasmic chemical balances and constituency as a result of

the influx of molecular agents through the membrane. Thus the cytoskeleton is viewed as an intermediary active process in the “computation” (akin to summation and weighting of a simple feed-forward network, as in the calculation of local minima and maxima) that translates cellular membrane measurement events pertaining to the presence or absence of neighboring cells, antigen interaction, and the presence or absence of nutrients and other factors relevant to cell equilibrium, into discrete signals that result in epigenetic actions within the chromosomal bodies that in turn translate into genetic switching. In the simplest formulation, the model suggests that (a) epigenetic actions are influenced and triggered by boundary measurements initiating with the cell membrane acting as a massive sensor of extracellular and cell-entrant events, (b) that the accumulative interactions of the cell membrane with its surface neighborhood, including penetrating agents such as antigens and viral bodies, are communicated into dynamic conformational changes in the cytoskeleton, and (c) that these conformations regulate the activity of epigenetic agents affecting histone binding and methylation which are the mechanisms for controlling the transcription of specific genes.

### **1.6 CUBIT™**

CUBIT is an architecture for systems that will mitigate epidemic-scale disease transmissions emerging from the introduction of new or unexpected pathogens into a population. A system designed and built according to CUBIT principles incorporates sensors and data collectors (using the Nomad Eyes™ architecture as the design substrate), human observers and monitors, an informational framework of autonomous cooperating software agents, bioprotectant and/or decontamination procedures, compact and rapid-turnaround diagnostic tests, population control protocols, and clinical treatment plans. A CUBIT system is designed to be employed as a preventive and responsive component that can be embedded within larger public health, emergency management and homeland security operations for specifically addressing the emergence of particular biothreats...

### **1.7 HealthNVest™**

A web-based application content management (portal) product, developed originally in support of disease management efforts at a major US healthcare company. Oriented toward serving a diversified population of healthcare clients, both those faced with chronic DM conditions as well as those maintaining and advancing wellness programs for their individual and family lives.

## **2. Paint-a-Position**

A recruiter asked me recently to describe an ideal job description, in terms of what I could provide, in this case, to a biotech-related or bio-tech-interested company. This comes close.

Title: TBD (flexible)

Responsibilities:

(main) Assess and evaluate emerging, especially “disruptive” technology trends, markets, needs, and capabilities in biomedical diagnostics and/or therapeutics, focusing upon resistant infectious diseases and/or cancer and/or immune-related diseases. Plan and manage R&D initiatives and coordination among current/new projects to deliver both short-term and long-term product solutions in one or more of these areas. Develop strategies and technical approaches to emerging transitions and critical/threat factors in (public) health including epidemiology, cancer, and the effects of malnutrition and poor diet (including oxidative stress, hormone imbalance, poor hydration, poor hygiene) in extensive populations. Address the emerging needs and market opportunities for a world population that is increasing in vulnerability and susceptibility while

decreasing in environmental, energy and financial resources. Apply natural skills and talents to technical and business synergy, “symbiosis” and synthesis methods with the objective of producing rapidly-deliverable, competitive, realistic solutions deriving from immunology, epigenetics, proteomics, nanomedicine and advances in antigen/epitope sensing.

(also) Lead as Principal Investigator a continuing project relating to the above (my main track of personal scientific research; already defined), the scope and budget for which will be determined by external grants as well as in-house planning.

Speak frequently in scientific, industry and agency conferences and workshops, serve on industry/technical committees and panels (particularly within industry/govt. consortia), organize and/or participate in tutorials, and produce publications.

Not (for the most part) focused only upon: cardiology, GI, urology, Alzheimer’s, muscular-skeletal, Ob/Gyn, respiratory, aging, or health care IT, admin, regulations, marketing, sales

Main “people” interactions:

(In-house) Research, business development, financial planning, marketing

(External) Research (universities, institutes, small companies, consortia members), NIH, DHHS, UN, international health agency counterparts

Travel: Probably 45% - 70%

Base (residence): Flexible. Can relocate and operate in and from multiple locations. Very comfortable with international and multinational environments.

### 3. Reference Pool (partial)

#### ***Companies and Clients***

- Biosafe, Inc., Pittsburgh, PA  
Technical consulting on antimicrobial polymers for biodefense, pandemic prevention, decontamination and public health
- Boeing Company, Huntsville, AL  
Consulting services 2004-2005 on radiation threat countermeasures, biomed focus
- Cyclone Power, Pompano Beach, FL
- Intel Corporation, Santa Clara, CA  
Consulting [post-fulltime-employment] on nanoscale computing and multi-core computing
- Solutia, Inc., Worcester, MA  
Technical consulting on smart polymers and advanced integration of nanoscale materials

#### ***Individual Contacts – collaborators, employers, clients, colleagues***

Robert Ashley, US Navy, Naval Surface Weapons Center

Michael Chandler, Inst. for Defence and Strategic Studies, former MI5, SAS (ret.)

Henry Chu, PhD, Senior Scientist, Idaho Nat'l Laboratory

Richard Freer, PhD, VCU Biomedical Engineering Dept. (Chmn);CEO, Commonwealth Biotech

Frank Geberich, VP for Business Development and Polymer Film Technology, Solutia, Inc. (ret.),

Gerry Getman, PhD, CEO, Biosafe, Inc.

Richard Satava, MD, Univ. of Washington, DARPA program manager

Dorothy Small, Senior Scientist, Shaw Group

Paul Werbos, PhD, Program Manager, National Science Foundation

Col. Paul Wharton, US Army SOCOM; National Guard (ret.)