LIST OF AWARD RECIPIENTS
UB 2020 RESEARCH AND DEVELOPMENT ACTIVITIES FUND (IRDF)

Principal Investigators
and Co-Investigators
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"Intermedia Performance Studio"

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Project Description

The Intermedia Performance Studio (IPS) will be an interactive space designed to bring media artists, computer scientists, and performers together in performance-based collaborations. The immediate project will create a proof-of-concept studio to solicit external funding for a permanent IPS that will serve as a local and regional resource. Emerging from on-going activities in virtual and simulated performances, this new studio will support projects that explore the integration of real and computer-controlled characters, and the collective impact of performances as both an embodied experience—a live audience watching live actors perform—and as a virtual performance—a remote audience watching computer-manipulated actors and human-manipulated avatars on screens. The IPS will further support flexible, mobile audience configurations. For example, audiences may shape the action of the drama by virtually controlling elements of the performance—characters, scenery, obstacles—or, they may simply move through physical space to select a favorite viewing position.

More than any one project, the IPS will be a Western New York regional facility that supports ongoing and simultaneous creative experiments and research projects in many areas: the uses of motion capture for virtual performers and computer performers; the development of actor-agents; virtual acting for film; and machinima—filmmaking in a real time, 3D virtual environment; as well as many others. Unique among similar media centers, the IPS will be primarily devoted to performance research, including notions of avatars as puppets, power dynamics in interactive drama, and the role of the audience in virtual reality.

“Drug War Casualties Come Home”

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Project Description

The period from 1985 to 1995 saw a massive increase in the number of people incarcerated for drug law violations. According to the US Department of Justice, nearly 650,000 incarcerated individuals, many of whom are drug offenders, each year are released back into communities nationwide. This project will investigate how formerly incarcerated individuals develop effective pathways out of drug use, drug addiction and drug trafficking. From our findings we will develop an intervention strategy for the healthy reintegration of offenders back into their communities. The goals of this project include:

1. Conduct qualitative interviews of formerly incarcerated drug offenders in the Buffalo/Niagara region.
2. Identify protective factors and risk factors associated with formerly incarcerated drug offenders who are successful in remaining drug free and in abstaining from drug trafficking.
3. Understand the role of community (family, social agencies, block clubs, churches, and employers) in assisting formerly incarcerated drug offenders to remain drug free.
4. Develop a short pilot documentary film examining our subjects’ strategies for success and sheds light on the struggles these individuals confront daily in their efforts to exit from drug use.
5. Develop our baseline data as a foundation to apply for additional funds to develop an effective intervention strategy designed to promote the reintegration of formerly incarcerated drug offenders back into society.
6. Use the documentary pilot film to raise funds for the production of documentary and short teaching films that will serve as an intervention designed to reduce recidivism among formerly incarcerated drug offenders.

"A Systems Biology Approach in High-Value Chemical Biosynthesis"

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Project Description

Microbial biosynthesis of specialty and commodity chemicals offers significant advantages overconventional chemical methods including lower energy requirements, lower CO2 emissions, less toxic waste, simpler purification schemes, renewable feed stocks such as corn or soybeans, and the general ability of enzymes to perform chiral synthesis. The critical problem to be overcome now is making microbial synthesis cost- competitive by increasing the specific productivity.

To increase the yield of product, we will employ a systems biology approach using a comprehensive mathematical model of all of the known biochemical processes in *Escherichia coli* (a commonly used industrial microorganism), to select those pathways whose elimination will enhance carbon flow into high-value chemicals while preserving the cell's ability to grow. Initially, a heuristic approach will be employed to identify primary and secondary knock-out mutants, while at the same time new algorithms will be developed based on Linear Optimization approaches in order to identify higher order mutations. *E. coli* knock-out mutants will then be prepared for the most promising genes, according to standard homologous recombination techniques and productivity increases will be assessed by measuring the intended end-product. The design of such optimal cellular genotypes and phenotypes will be tested towards the biosynthesis of natural products with pharmaceutical and nutraceutical applications.

Overall success in this project will result in a systems-biology approach that can be applied towards the biosynthesis of a vast array of promising compounds at commercially reasonable levels. It will put into practice a new discipline that can be applied to many other biosynthetic problems.

"The Health Buzz: A Spatio-Temporal Analysis of Food Consumption"

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Project Description

Of increasing concern to the public are issues related to health and disease and this is reflected in the market place in several ways. Some consumers are far more careful in terms of the food they purchase--decisions are often made based on the evaluation of nutrition contents. In turn, manufacturers are responding to these concerns by selling a variety of products which are healthy. Finally, several interest groups, such as insurance companies, pharmaceutical companies, health professionals, and consumer groups, send out messages about sustaining a good quality of life. Nevertheless, most general health indicators have shown a steady deterioration over the last 20 years. The critical issue, then, is to understand and explain consumer response to such messages. Are consumers responding? If they are, what is the impact of such health-related concerns on consumer shopping behavior? In a metropolitan area, socioeconomic and demographic characteristics of the consumers vary from one part to another based on the clustering of racial/ethnic and income groups. Do these characteristics affect the pattern of healthy food consumption across a metropolitan area? Using purchasing data from a grocery chain, the objectives of this study are to evaluate geographic patterns of healthy food consumption over the past 3-4 years in the Buffalo metro area and to analyze the relationship of such consumption with socio-demographic and economic characteristics of the neighborhoods. Policy implications pertaining to the link among health consciousness, marketing trends of food companies and grocers, and the resultant consumer behavior are also explored in this study.