Contents

1. Mission and Vision
2. 2012 Leadership
3. President’s Letter
4. 2012 Research News
5. Current Partnering Organizations
6. Current Partnering Research Institutions
7. Financials
Cures Within Reach (formerly Partnership for Cures) has been helping patients since 2005 by repurposing drugs and devices to quickly deliver safe and affordable treatments and cures for both common and rare disorders without currently effective treatments.

Through this work, Cures has emerged as a leader in the Repurposing Revolution, working to transform patient lives through research that looks backward in order to move forward. While patients with catastrophic diseases are suffering, we know that there are immediately usable medical solutions going unnoticed: familiar drugs and devices that have new uses and can improve length and quality of life today. By finding and funding clinical trials with this approach, Cures is creating a powerful new leg of pharmaceutical development, a unique innovation pathway to solve unmet medical needs via repurposing.

Our broad vision at Cures Within Reach is of a world in which the success of medical research is measured by how it has reduced patient suffering; a world in which existing drugs and devices are mined for all utilizations, creating maximum benefit for patients in need.

We are happy to report our progress in 2012 and send a thank you to all individuals and organizations that have joined with us to create results!

Leadership

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Andrew Maniotis, Ph.D.
Medical/Science Consultant
A Letter from the President

2012 was a year of success and transition for Partnership for Cures/Cures Within Reach! The Patient Impact Initiative research pipeline continued to deliver us a creative, high impact, low cost research portfolio that we are able to match with diverse funders.

Our Partner Research Institutions generate 125-250 new Rediscovery Research proposals each year and our Science Advisors and Executive Board rank and select 20 projects for our PII Portfolio. We solicit patient support groups, foundations and philanthropists to fund these proof of concept trials that cost $100,000-$300,000 over a 12-36 month period. These projects can include:

1) Repurposing FDA approved drugs, devices and nutriceuticals to treat “off label” diseases
2) Testing Pharma and other shelved compounds for new indications
3) Combining drug and non-drug treatment
4) Modifying current treatment protocols to make them work better and help more patients
5) Testing clinical observations from integrative medicine or from other parts of the world

Through this research sourcing process and our partnerships with smaller, disease specific organizations, we were able to initiate six new research projects, one of which has already completed; receive final results on two past projects; and continue to watch others unfold. Read more about our research progress in the next section.

2012 also brought with it the first meeting of our Business Advisory Board, a record-breaking fundraising year for the Longest Day of Golf, an expansion of our staff and a name change to greater reflect our commitment to patient impact.

Come join us!

Dr. Bruce E. Bloom
President and Chief Science Officer
Research: Completed, Initiated and Ongoing in 2012

Completed in 2012
Two past prostate cancer projects funded through the Longest Day of Golf wrapped up this year with positive results, making a difference for patients today and directly leading to much larger clinical trials. We funded, initiated and wrapped up our first project with BioVista, a corporate partner, who has developed technology to extensively search existing data and find cross relations indicating the best possible repurposing candidates in a particular disease area. See summaries below and on our website.

Safe and Specific Laser Treatment for Prostate Cancer
Drs. Scott Eggener and Oto Aytekin, University of Chicago, $50,000  Completed: 02/2012
Drs. Eggener and Oto at the University of Chicago are eradicating prostate cancer in its earlier stages using a laser that heats and kills just the cancer cells. The treatment takes just a few hours, is done under a mild sedation, and because the whole process is done under MRI observation, the system reduces the chances of injuring surrounding tissue to nearly zero!
After the treatment, patients walk away with a small Band-Aid and resume their normal activities. The laser device was originally designed for use on breast cancer and brain cancer. Drs. Oto and Eggener approached Cures Within Reach to see if our funders would be interested in supporting the first repurposing of this device for prostate cancer. We contacted one of our funding groups, the organizers of our Longest Day of Golf, and they agreed to raise the $50,000 to cover the costs of the clinical trial over the two year period. In less than 9 months after the initial inquiry from Drs. Oto and Eggener, 9 patients were experiencing the impact of this promising new treatment with excellent initial results and years later, they are continuing to thrive! This pilot clinical trial helped patients directly, and led to the application for a larger clinical trial funded by $500,000 from the NIH. Final Report available on our website.

Biomarker analysis on circulating prostate tumor cells using a novel microcapture device
Dr. Russell Szmulewitz, University of Chicago, $50,000  Completed: 08/2012
The goal of Dr. Szmulewitz’s research was to find markers on prostate cancer cells circulating in the blood of hormone resistant prostate cancer patients that can be used to find new drugs and then to determine how well those drugs work. Finding markers on cells floating in the blood will make it much easier, safer and less expensive to take samples from patients. If you can't find these cells in the blood, you have to find them by taking a biopsy from inside the body.
This positive data from this small and affordable trial have generated the following exciting results:

1) A fully funded clinical trial at U of Chicago using the techniques developed during this research. This clinical trial is testing two markers for prostate cancer on cancer cells in the blood that are specific targets for a new and exciting prostate cancer therapy.

2) A second clinical trial is waiting to begin, but has been accepted for Federal funding, using the same testing procedure but a different set of markers, in the context of a clinical trial testing a novel combination of prostate cancer therapies.

3) 9 grants have been submitted based on the success of this project-3 government grants and 6 private foundation grants. The total amount of these grants is over $2,000,000. In addition to the two funded trials mentioned above, an additional two grants have been awarded from private foundations totaling ~$100,000, and one government grant ($450,000) is still under review. These grants incorporate the patient oriented research tools developed during the initial project.

4) The original grant was using a micro filtration system to try to extract the cancer cells from the blood. It was clear early on that this procedure was not successful. Dr. Szmulewitz was able to find a different method of extracting the cancer cells that was far simpler and more effective. A manuscript on that procedure and the outcomes of the initial project has been submitted for publication.
Systematic Drug Repositioning for Finding Therapies to Treat Early or Zero Stage CLL
Dr. Aris Persidis, BioVista, Inc.  Completed: 11/2012
This project, carried out by the biotech company BioVista, Inc., was designed to do the following:

1) Present promising repurposing candidates for early/zero stage Chronic Lymphocytic Leukemia (CLL) that may synergize mechanistically with currently available drugs

2) Examine how these repurposing candidates can fit into specific treatment plans

The project uncovered 16 existing drugs and nutriceutical compounds for which there is significant scientific evidence of a potential positive effect on zero/early stage CLL.

Initiated in 2012
Five new projects began in 2012, spanning breast cancer, juvenile diabetes, melanoma, and batten disease. Funding sources included our batten disease organizational partners, the Lloyd Kupferberg Cancer Research Fund, and Petco. See summaries below and on our website. The pediatric brain cancer project funded through the Longest Day of Golf is experiencing institutional delays and we anticipate it starting in May of 2013.

Increasing the Effectiveness of Radiation in Breast Cancer Treatment
Dr. Ralph R. Weichselbaum, University of Chicago, 2 years, $100,000  Start Date: 04/2012
Due to important advances in detection and treatment of breast cancer, the majority of patients are diagnosed with early stage cancer, and many are cured. However, too many patients are still diagnosed after their cancer has spread out of the primary site and adjacent lymph nodes to form metastatic tumors in the lung, bone, brain or other sites. For many such patients, even if only one metastasis is detected, their disease will be ultimately fatal despite aggressive treatment with chemotherapy, conventional radiation therapy and/or targeted agents. An effort to discover a cure for metastatic disease offers tremendous potential for impact on the most lethal kinds of cancer.

This research group studied the benefits of directly targeting up to five metastases using a high dose hypofractionated therapy only three times and at two week intervals. When they used the highest tolerated radiation doses on each tumor, nearly all patients benefitted, many survived much longer than expected and a remarkable number appear to have been cured.

They found that treating cancer cells with high radiation doses causes irreversible chromosomal damage, instantly aging the cells so they can no longer grow or reproduce. They think that the combination of inflammation and near dead cells in the irradiated tumor may stimulate the patient's immune system, and the resulting anti-tumor reaction clears the body of cancer.

However, hypofractionated radiation therapy incurs considerable risks due to high individual doses. This limits its use to a few tumor sites and to tissues that tolerate high doses, excluding many patients from treatment. The researchers hypothesize that it may be possible to reduce the radiation doses if they can induce accelerated aging of tumor cells with benign drugs plus lower doses of radiation. Through drug screening they have already discovered nearly 100 candidate radiation enhancers that have the potential to fulfill the key criteria of ready availability, low toxicity and strong enhancement of radiation-induced accelerated cell aging.

They propose to advance several of these leads by testing these drugs in combination with radiation on breast cancer cells and begin the process of qualifying the most promising radiation sensitizing drugs for human clinical studies in breast cancer patients toward achieving high efficacy with lower doses in hypofractionated radiotherapy.

Impact of Pet Ownership on Blood Sugar Control in Youth with Type 1 Diabetes Mellitus
Dr. Olga Gupta, University of Texas Southwestern, 12 months, $11,430  Start Date: 08/2012
The researchers aim to discover inexpensive and feasible strategies to improve blood glucose levels in children and teens with type 1 diabetes, a chronic disease of the pancreas that requires vigilant monitoring of blood glucose levels and insulin management. A number of other studies have found that social factors can help
in diabetes control. The researchers theorize that the positive effects of owning and caring for a pet, specifically the responsibilities involved in pet care, will also have beneficial results for diabetes management.

This Rediscovery Research project will measure how caring for a pet fish impacts diabetes management in children. The patients will be randomized into two groups, those receiving a fish and all items necessary to care for it, and a control group that receives a photo of a fish. It is hypothesized that the fish care-takers will have fewer hospital/emergency room visits related to diabetes, and that they will show significantly improved control of blood sugar levels.

A large version of this research trial has recently been funded by the NIH and so the funds from Cures Within Reach will enable an additional outcome measure (Quality of Life assessment) to the NIH proposal for patients with Type 1 diabetes mellitus.

Exome and Next Generation Sequencing to Identify RARS-specific Targetable Defects
Dr. Arza Raza & Naomi Galili, Columbia University, 36 months, $1,000,000 Start Date: 08/2012

This research will complete a comprehensive step-wise study of myelodysplastic syndrome (MDS) RARS patients in a two pronged approach. The research team will start by sequencing the genomic DNA of a recent patient, and simultaneously sequence 10 RARS patients from their Tissue Repository. In addition, they will perform RNA and methylation sequencing as well as specific mitochondrial DNA sequencing in order to correlate results from all four sources (exome, RNA, methylation and mitochondrial) to generate a comprehensive molecular portrait of this specific subtype of MDS.

They expect that these results will provide insights into potential therapeutic targets which can be used to develop novel therapies rapidly. Many non-toxic small molecules have already been identified that can block multiple such targets or their pathways including one developed in-house. Such drugs have been routinely discovered through high throughput small molecule screening. If initial analysis does not yield a definitive target, they will proceed to the next 10 RARS patients and so on until a total of 100 have been studied. However, all potential defects identified in the genome of Patient One will be confirmed and a mouse model will be developed for those which seem to be biologically relevant to her disease.

Training Physicians to Perform Opportunistic Screening for Melanoma
Dr. June Robinson, Northwestern University, 24 months, $30,000 Start Date: 12/2012

Age-adjusted incidence of melanoma among whites has risen from 7.5 to 21.9 cases per 100,000 representing an increase of nearly 200% over 30 years. Survival is improved with early detection of melanoma and surgical treatment. An estimated 16% of all melanomas are discovered by physicians. With approximately half of all US physician office visits to the patient’s primary care physician, primary care physicians have the opportunity to detect melanoma.

In contrast to other cancers (i.e. colorectal, prostate, cervical), melanoma is detected by non-interventional visual skin. Lack of primary care physician training and low confidence in their examination skills are consistent obstacles identified as barriers to better early detection of melanoma. This lack of self-confidence increases the likelihood that newly graduated primary care trainees will not perform opportunistic screening for melanoma.

Two life-size back simulation models of Ecoflex silicone rubber were created to replicate representative clinically suspicious lesions: melanomas, abnormal nevi, benign nevi. The melanoma simulation models and threshold rules for management afford medical students the opportunity to learn visual assessment, management, and counseling skills. The goal is biopsy of 100% of melanomas with 20% of benign lesions either watched for change or referred to a dermatologist for assessment. During the Primary Care Clerkship, 81% of third year medical students achieved the goal of biopsying melanomas and 14% chose to watch the lesions for change in 3 months; however, 50% of benign lesions were watched for change or referred to the dermatologist.

By adding rules for dermoscopic (magnified) evaluation of the pigmented lesions to the skills training process, it is expected that fewer benign lesions will be watched for change or referred to a dermatologist and the detection of melanoma at an earlier phase, melanoma in situ, will improve.

Biomarkers for Rapid Assessment of Experimental Treatments in LINCL Batten Disease
Ronald G. Crystal, MD, Weill Cornell Medical College, 36 months, $47,000 Start Date: 04/2012
Batten Diseases comprise a group of genetic diseases that affect children. Children with these gene defects are missing key enzymes that help to break down waste products in brain cells. These waste products build up, and eventually destroy the brain cells. This causes a loss of function in these children, and eventually death.

This research team is helping to find Batten Disease biomarkers in the blood and other easily accessed fluids and cells in the human body. Biomarkers are molecules that help researchers and clinicians check to see how a disease is progressing, and if a treatment is working. Having a biomarker to check a disease is like having a water sample to check the chlorine content in a pool—you take a small sample and test it to check the overall status. If this study can find these biomarkers, we will have a powerful tool that will help us find new life saving treatments for children with Batten Disease.

Update 02/2013

This project is screening biomarkers in the cerebrospinal fluids (CSF) of Batten Diseases children compared to CSF from non-Batten children. The techniques used in this study enable the simultaneous detection of thousands of metabolites in a modest quantity of CSF fluid (<5 µL), with an accuracy that enables definite assignment of molecular formulae and quantitative changes in expression levels.

Metabolite profiling was performed on the CSF from 2 groups: (1) normal (7 subjects), and (2) Batten Disease (18 subjects). Five µl of CSF was analyzed from each subject. 1042 distinct metabolites were identified and 60 metabolites were found to have > 2-fold difference between LINCL vs. normal subjects.

This preliminary data is very interesting and supportive of our hypothesis that the CSF of Batten children have different metabolites from non-Batten children.

Screening Drug Libraries for Efficacy in Stimulating Mutated CLN2 Genes (Batten Disease)

David A. Pearce, PhD, Sanford School of Medicine, 12 months, $45,000 Start Date: 04/2012

We propose a project to screen drug libraries for agents that show efficacy in stimulating the activity of mutated CLN2 genes in a defined cell assay.

An outline of this project is:

- We will use standard fibroblasts for screening assays, supplemented by CLN2 affected fibroblasts with the required mutations we received through an MTA with General Hospital Corporation.
- We will set up and optimize the assay in a 96-well plate format. Fluorescent detection will be used to obtain the primary data. The assay is summarized as follows:
  - Cells will be grown in 96 well plates, rinsed and lysed with a triton X-100 lysis buffer. Plates will be incubated in the cold for 1 hour at 4°C on a shaking platform, and then a substrate will be added. The plates will be warmed and the fluorescence read over time on a 96-well plate reader.
- The Sanford Library, supplemented by other approved drugs, will be screened using the cell-based assay. The library will be screened at several drug concentrations, usually 10 mM and 100 mM.
- Drugs that appear to increase LINCL activity will be further studied using conventional dose ranging to determine effective doses and establish the reproducibility of individual drugs and combinations of drugs.
- Any drugs, compounds and combinations that appear to up- or down-regulate the production of TPP-1 will be further studied to provide further insight into mechanisms of the disease and pathways for abrogating the negative effects of the mutation.

Ongoing in 2012

We continue to receive reports on the following projects as they unfold - more information and updates available on our website.

Repurposing a Generic Drug for Pediatric Auto-Immune Diseases

The Use of Drug X for Treatment of Seven Pediatric Autoimmune Diseases

Dr. David Teachey, Children's Hospital of Philadelphia, 36 months, $53,247

Start Date: 09/2011

Therapeutic Potential Of Inhibiting p38 MAP Kinase In RARS

Dr. Amit Verma, Albert Einstein Medical Center, 24 months, $48,000
Start Date: 06/2009

Repurposing BCG as a Low-Cost Treatment for Type 1 Diabetes - Phase II Human Clinical Trial
Denise Faustman, MD, PhD, Harvard and Massachusetts General Hospital, 36 months, $25.6M
Start Date: 01/2011

Stem Cell Transplants for Blood Cancers
Dr. Luis Porrata, Mayo Clinic, $450,000
Start Date: 09/2008

Repurposing Breath Analysis Devices for Early Diagnosis of Lung Cancer
Dr. Peter Mazzone, Cleveland Clinic, 2 years, $45,000
Start Date: 08/2010

Our Organizational Partners

The following groups have partnered with us in 2012 for mutual benefit. We have provided support in the form of 501(c)3 status, donation processing, and helped with sourcing and/or vetting research funding opportunities. Working with multiple Batten Disease groups has helped us to support research progress in a rare, pediatric disease area with so few patients that the research tends to be sparse.

Our Research Institutional Partners
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2011-12 Financial Documents Coming Soon