

Channel Islands Alzheimer's Institute

Mission Statement

The Channel Islands Alzheimer's Institute (CI-AI) provides interdisciplinary experiential learning opportunities in the area of Alzheimer's disease drug discovery for CSU Channel Islands faculty and undergraduate and graduate students.

Overview of the Channel Islands Alzheimer's Institute

With the full and enthusiastic support of the CSU Channel Islands' Biology and Chemistry programs, a **self-supporting academic research institute**, the Channel Islands Alzheimer's Institute (CI-AI), is proposed to be created on campus. The Alzheimer's Institute (AI) will conduct interdisciplinary research projects with CSUCI faculty and students that involve hands-on, collaborative research, which cross the traditional disciplines of biology, biochemistry, biotechnology, chemistry, and medicinal chemistry. Funding for CI-AI will be obtained through directed donations through the CSUCI Foundation and/or through grants submitted through the Office of Research and Sponsored Projects.

The Channel Islands Alzheimer's Institute will utilize a drug discovery platform conceived by Dr. Gil Rishton, formerly a medicinal chemist at Amgen and currently an adjunct professor in the Chemistry Program, which involves the extraction and chemical treatment of natural materials ("chemical conditioning", Figure 1) to provide novel drug-like compounds for biological testing. The research conducted at CI-AI will focus on early-stage drug discovery projects intended to discover new drug candidates for the treatment and prevention of Alzheimer's disease (AD) as well as providing "chemically conditioned" extracts for industrial collaborators. A diagram of the proposed research to be conducted by CI-AI is provided in Figure 1.

Dr. Rishton is currently pursuing private funding for Alzheimer's research as the *Alzheimer's Initiative* (not yet a for-profit or non-profit organization). He has committed matching funds to three CSUCI faculty members (Wang, Denton, and Hampton) for proposals submitted to the California State University Program for Excellence in Research in Biotechnology (CSUPERB) totaling \$55,000 for collaborative research between these faculty investigators and the *Alzheimer's Initiative*. It is the goal of this proposal to the Committee on Centers and, subsequently to the Academic Senate and the President of CSUCI, to create the Channel Islands Alzheimer's Institute as a self-supporting research institute on the CSUCI campus. Once CI-AI is created, Dr. Rishton will pursue directed donations to the CSUCI Foundation in the name of the Channel Islands Alzheimer's Institute which will be used to renovate research space, hire staff and student researchers, and to hire a director for the institute. In addition, funding will be pursued from federal sources to obtain equipment for the institute that could be utilized in the campus' instructional mission.

The process of "chemical conditioning" is potentially patentable intellectual property. This process involves chemically modifying extracts of terrestrial and ocean plants with chemical reagents and then separating the modified extracts into its components. The separated components will then be placed into 96-well plates and screened for activity against enzymes involved in the onset of Alzheimer's disease and for the ability of the components to induce stem cell differentiation for neuroregeneration, e.g., conversion of stem cells into

nerve cells). Two collaborators, one in China and EpiGenX in Santa Barbara, have been identified who could conduct the stem cell differentiation research. This research could allow the campus to tap into the stem cell research monies (Proposition 71) recently approved by California voters.

Successful lead compounds from this screening would be characterized and developed into potential new drugs through licensing of this intellectual property to a pharmaceutical company. The screening of natural-occurring compounds has been a very successful approach to drug development; however, no one has taken the approach of chemically-modifying the extracts to make them more drug-like and to enable them to be absorbed. This is the approach that the Channel Islands Alzheimer's Institute will take. Collections of the 96-well plates will be archived and saved as a potential drug candidate library. The plates themselves could generate financial support for AI-CI and the University, since companies could pay the University royalties to screen the compounds on the plates in their disease assays, i.e., cancer, diabetes, etc. If a company found a high activity of a compound in one of the wells on a plate, they would need to license the compound in the well through the University to develop the compound as a new pharmaceutical.

Long-Term Objectives

The Long-Term Objectives of the Channel Islands Alzheimer's Institute are the following:

- To develop research excellence in Alzheimer's disease drug discovery.
- To secure CSU system (CSUPERB), state, and federal grant and contract funding to support the research activities performed by AI-CI.
- To develop community relationships facilitating directed donations to CI-AI through the CSUCI Foundation.
- To publish research and patent intellectual property developed by AI-CI.
- To license intellectual property and secure revenues that will benefit AI-CI and CSUCI, in accordance with the CSUCI Intellectual Property policy.

Short-Term Objectives

The Short-Term Objectives of the Channel Islands Alzheimer's Institute are the following:

- To establish Alzheimer's disease research on the campus using "conditioned extracts" obtained through "chemical conditioning" of natural materials (Figure 1).
- To remodel a small research laboratory for use by the Channel Islands Alzheimer's Institute.
- To obtain chemical separation and analysis equipment and biological compound purification equipment for the research lab that could be used both by CI-AI and by university faculty in their Chemistry and Biology courses.
- To develop an archived collection of novel drug-like compounds for biological testing obtained from purified conditioned extracts.
- To allow companies the opportunity to pay royalties to obtain access to the diversity of molecules in the archived 96-well plate extracts for screening in their own assays for the desired biological activity.
- To secure funding from a range of public and private sources to support the research of the Channel Islands Alzheimer's Institute.

Benefits to CSU Channel Islands

The Channel Islands Alzheimer's Institute will benefit CSU Channel Islands by:

- Providing applied research opportunities for students and faculty in Chemistry and Biology at CSUCI,
- Increasing CSUCI's competitiveness for CSU System, State, and Federal funding through the creation of a highly visible research center,
- Enabling fund-raising for research projects by science faculty and students in the form of tax-deductible contributions and grants/ contracts,
- Creating valuable intellectual property for CSUCI which could lead to a substantial revenue stream for the campus, and
- Developing potential new drugs to treat the unmet medical need of Alzheimer's patients.

Organizational Structure

An organizational chart for the Channel Islands Alzheimer's Institute is provided in Figure 2. Once sufficient funding has been obtained through directed donations or grants, a director for the Channel Islands Alzheimer's Institute will be hired as a CSU employee. The Director will report to the Chair of Biology Program (and also the Chair of the Chemistry Program, if such a position is created) for the purposes of coordination of science equipment use and student internships. The direct supervisor of the Director will be the Dean of the Faculty. Dr. Rishton is uniquely qualified to serve as the Director of the Channel Islands Alzheimer's Institute. The Small Business Institute uses a similar model where a lecturer uses grants to buy-out his time as the Director of the Small Business Institute.

Responsibilities of the Director include managing the budget for the Channel Islands Alzheimer's Institute, hiring and supervising staff, securing funding for the remodeling of laboratory facilities, purchasing equipment, and performing research on the "chemical conditioning" approach. Partnerships between the Channel Islands Alzheimer's Institute and collaborating industries/ companies will be established through a memo of understanding with each industry/ company. Any CSUCI faculty member who has research interests that complement the research being conducted by CI-AI can collaborate with CI-AI and submit proposals for collaborative research through the Office of Research and Sponsored Projects.

Sources and Potential Sources of Financial Support

Funding for the Channel Islands Alzheimer's Institute will be obtained from research grants submitted through the Office of Research and Sponsored Projects and from directed tax-deductible donations administered by the CSU Channel Islands Foundation. The Director of Channel Islands Alzheimer's Institute will either be a "soft-money" position or a buy-out of the teaching load of a person hired as a CSUCI lecturer. The latter funding model has precedence in the Small Business Institute. Dr. Rishton will work with the CSUCI Foundation to solicit donations for the Channel Islands Alzheimer's Institute through the CSUCI Foundation in advance of the hiring of a Director of CI-AI. The Director's salary will be paid entirely from grants, contracts, or donations from private sources.

Impact on CSU Channel Islands Programs

The Channel Islands Alzheimer's Institute will provide CSUCI undergraduate and graduate students with the opportunity to gain first-hand exposure to modern techniques and

instrumentation. Work conducted by CI-AI will generate scientific publications, a vital component in the training of students as research scientists and a component of the review of faculty members under the RTP policy. Intellectual property developed by the Center will benefit the University by providing a revenue stream from the licensing of the intellectual property/ patents. The Institute will provide CSUCI with a visible commitment of the campus to applied research in drug discovery which could facilitate donations from major pharmaceutical or biotechnology companies, i.e., Amgen, Baxter, etc.

Physical Resources Required

Several start-up companies on campus have already agreed to let Dr. Rishton and the *Alzheimer's Initiative* to use space that they are currently leasing from CSUCI. As soon as funding is available through directed donations and grants/ contracts to the Channel Islands Alzheimer's Institute, a combined organic chemistry laboratory and biological laboratory facility that has space for up to ten research staff members (1500 sq ft, and air handling for chemical fume hoods) will need to be remodeled. The cost for the renovation of this space will be covered completely through grants, contracts, or directed donations. The Channel Islands Alzheimer's Institute shall have access to laboratories and instrumentation maintained by the Biology and Chemistry Programs, provided that the use of these facilities and instrumentation does not impact instructional activities in these programs. Instrumentation purchased by the Channel Islands Alzheimer's Institute through grants, contracts, or private donation may be used in courses in the Biology and Chemistry Programs, provided that the use of this instrumentation does not adversely impact the research activities being conducted by the Center.

Intellectual Property

Although there is currently no intellectual property policy in place on the CSUCI campus, an interim policy has been drafted by the Office of Research and Sponsored Projects Advisory Committee (ORSPAC) and this policy will be submitted to the Executive Committee by the April 19, 2005 deadline for consideration by the Academic Senate. A copy of this policy has been provided with this revised proposal. The Channel Islands Alzheimer's Institute will abide by the interim policy and a future permanent Intellectual Property policy to be created by ORSPAC, including the distribution of any net income resulting from the successful commercialization of a discovery or invention developed by CI-AI. Donors through the CSUCI Foundation would be required to release any rights to Intellectual Property developed by CI-AI. Specific granting agencies have their own policies regarding Intellectual Property developed using funding provided by the agency. At the time of application for a grant, both the Office of Research and Sponsored Projects and Finance and Administration review proposals and approve the terms of the proposals.

Financing Requirements

No CSUCI funding will be requested for the salaries of the Director, staff, or staff researchers involved in the Channel Islands Alzheimer's Institute. Faculty collaborators, however, may receive support for collaborative research through start-up funds, mini-grants, or program funds provided by CSU Channel Islands. Matching funds may be needed in the future for research grants to be submitted to the National Science Foundation and the National Institutes of Health for joint-use equipment that will benefit the Center and undergraduate and graduate instruction at CSUCI.

Center Timeline

- July 2005: Opening of the Channel Islands Alzheimer's Institute and hiring of the Director of the Channel Islands Alzheimer's Institute
- Fall 2005: First student researchers hired to perform research associated with the Channel Islands Alzheimer's Institute
- Dec. 2005: Funding (Grant/ Contract/ Directed Donations) secured for renovation of research space for the Channel Islands Alzheimer's Institute

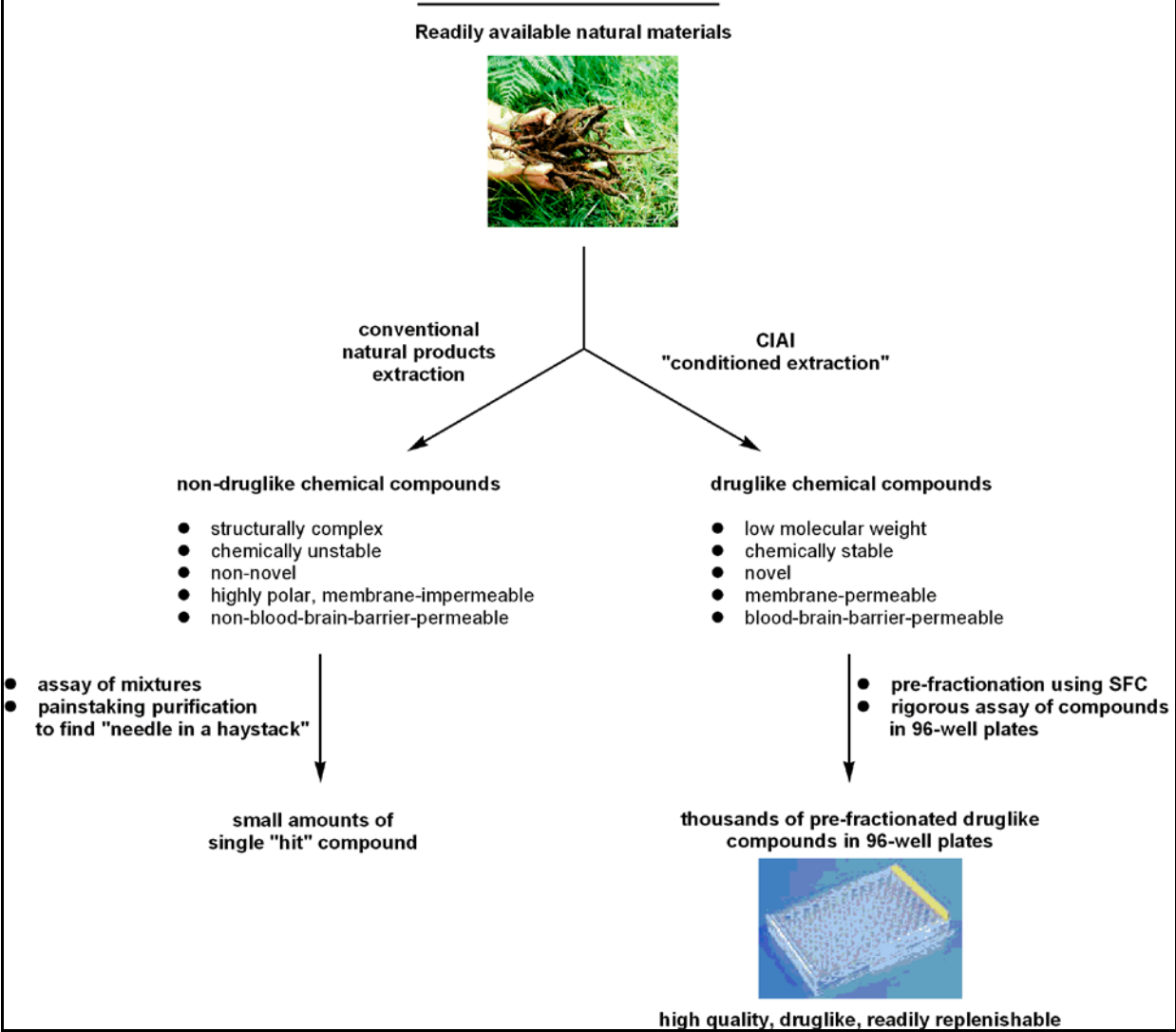


Figure 1. Conventional Extraction vs. CIAI "Conditioned Extraction"

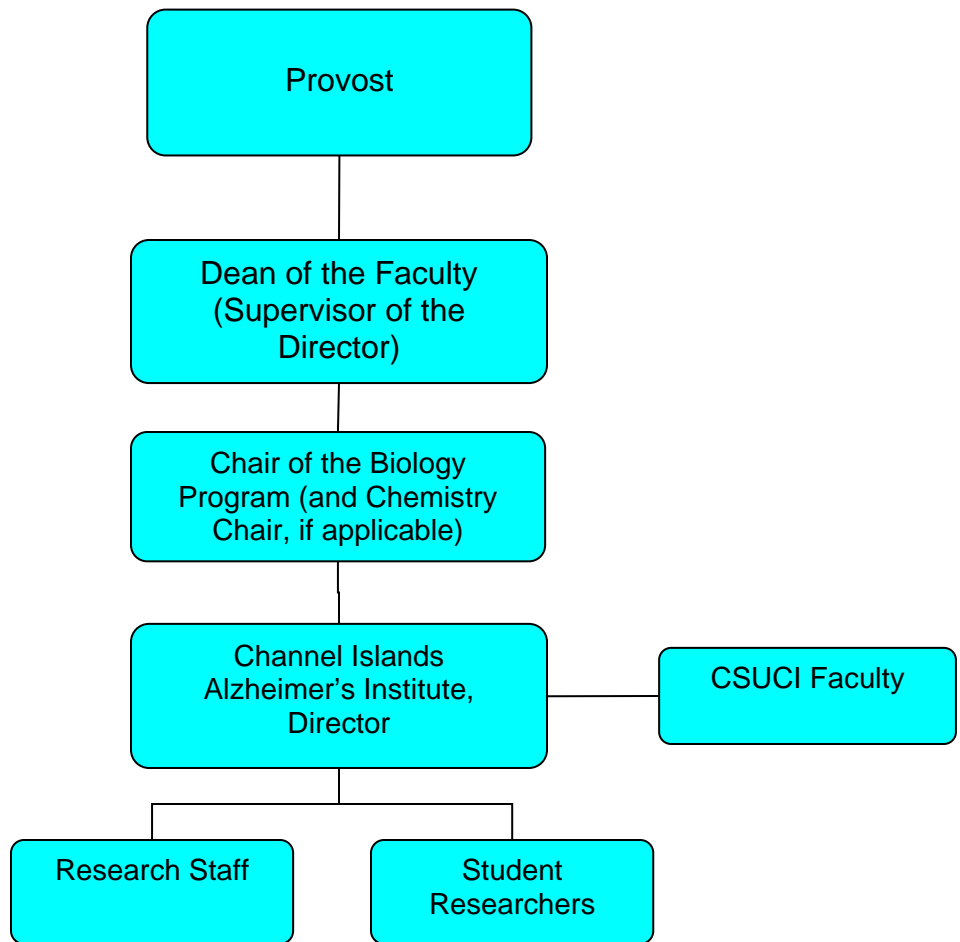


Figure 2. Organizational Chart for the Channel Islands Alzheimer's Institute