

ABSTRACT: 2013 ELAM Institutional Action Project Poster Symposium

Title: Enhancing the UC Davis Phase I Cancer Clinical Trials Program

Fellow: Karen Kelly, MD - UC Davis Health System, Sacramento, California

Collaborators: Ralph W. deVere White, MD, Ted Wun, MD, Frederick J. Meyers, MD, Kit Lam, MD, PhD, Jeanine Stiles, CAO, Cinda Lyon, RN, BSN and Daniel Redline, BA, CCRP

Opportunity: It is projected that cancer deaths will double by 2030. This alarming statistic is due to an increase in the aging population, who is at the highest risk for cancer, and the lack of effective drugs to treat the majority of patients who will develop advanced cancer. Significant progress has been made in our understanding of the molecular biology of cancer that can be exploited to develop more effective and personalized therapies. Molecularly targeted drugs have already proven highly successful in a handful of tumor types. Precision medicine, however, will require the discovery, development and evaluation of hundreds of agents. There is an urgent need to hasten this process. UC Davis' culture of integrated and multidisciplinary research, coupled with our unique attributes, is well positioned to create a successful program.

Objective: To develop a strategic plan that will outline the goals, expectations and resources needed to execute our vision to build a world class, one-of-a-kind Phase I Cancer Clinical Trials Program that will lead to life saving cancer therapies.

Methods: Stakeholders from the Cancer Center, Division of Hematology and Oncology, Department of Biochemistry and Molecular Medicine, and the Director of the IRB were involved in the planning process. Each stakeholder offered their leadership views and vision for defining the goals and objectives of an optimal phase I program that would align with the mission of the health system. A SWOT analysis, needs assessment and budget projections were completed to determine if a phase I cancer clinical trials expansion was viable and sustainable. A summary document was prepared, reviewed and finalized by the stakeholders.

Outcome: The stakeholders recommended approval to expand the Phase I cancer clinical trials program. There was a consensus that expansion will provide a substantial opportunity to broaden team science across campus and create new external partnerships around a common and increasingly unmet need for better therapies for cancer patients. Furthermore, it will address the demand by our patients to offer cutting edge treatments, provides philanthropic prospects and has potential to generate revenue. The plan has been submitted to the UC Davis Health System leadership for review.

BACKGROUND

It is projected that cancer deaths will double by 2030. This alarming statistic is due to an increase in the aging population, who is at the highest risk for cancer, and the lack of effective drugs to treat the majority of patients who will develop advanced cancer. Significant progress has been made in our understanding of the molecular biology of cancer that can be exploited to develop more effective and personalized therapies. Molecularly targeted drugs have already proven highly successful in a handful of tumor types. Precision medicine, however, will require the discovery, development and evaluation of hundreds of agents. There is an urgent need to hasten this process. The UC Davis culture of integrated and multidisciplinary research, coupled with our unique attributes, is well positioned to create a successful program.

OBJECTIVE

To develop a strategic plan that will outline the goals, expectations and resources needed to execute our vision to build a world class, one-of-a-kind Phase I Cancer Clinical Trials Program that will lead to life saving cancer therapies.

METHODS

Stakeholders from the Cancer Center Leadership, Executive Associate Dean, Cancer Therapeutics Program, Division of Hematology and Oncology, Department of Biochemistry and Molecular Medicine, and the Director of the IRB were involved in the planning process. Each stakeholder offered their leadership views and vision for defining the goals and objectives of an optimal Phase I program that would align with the mission of the health system. A SWOT analysis, needs assessment and budget projections were completed to determine if a Phase I cancer clinical trials expansion was viable and sustainable. Input from a nationally recognized Phase I expert was obtained.

OUTCOMES

VISION

The clinical evaluation of molecularly targeted agents however, is a highly complex process. Phase I clinical trials have evolved from the traditional determinations of drug dose, schedule and toxicity assessment to include 1) the identification of potential molecular predictive and prognostic markers for patient selection, 2) the molecular mechanism of action, and 3) the molecular mechanism of resistance. Our vision is to transform the Phase I program into a dynamic system where bench to bedside research continually revolves around one another to address these requirements (Figure 1).

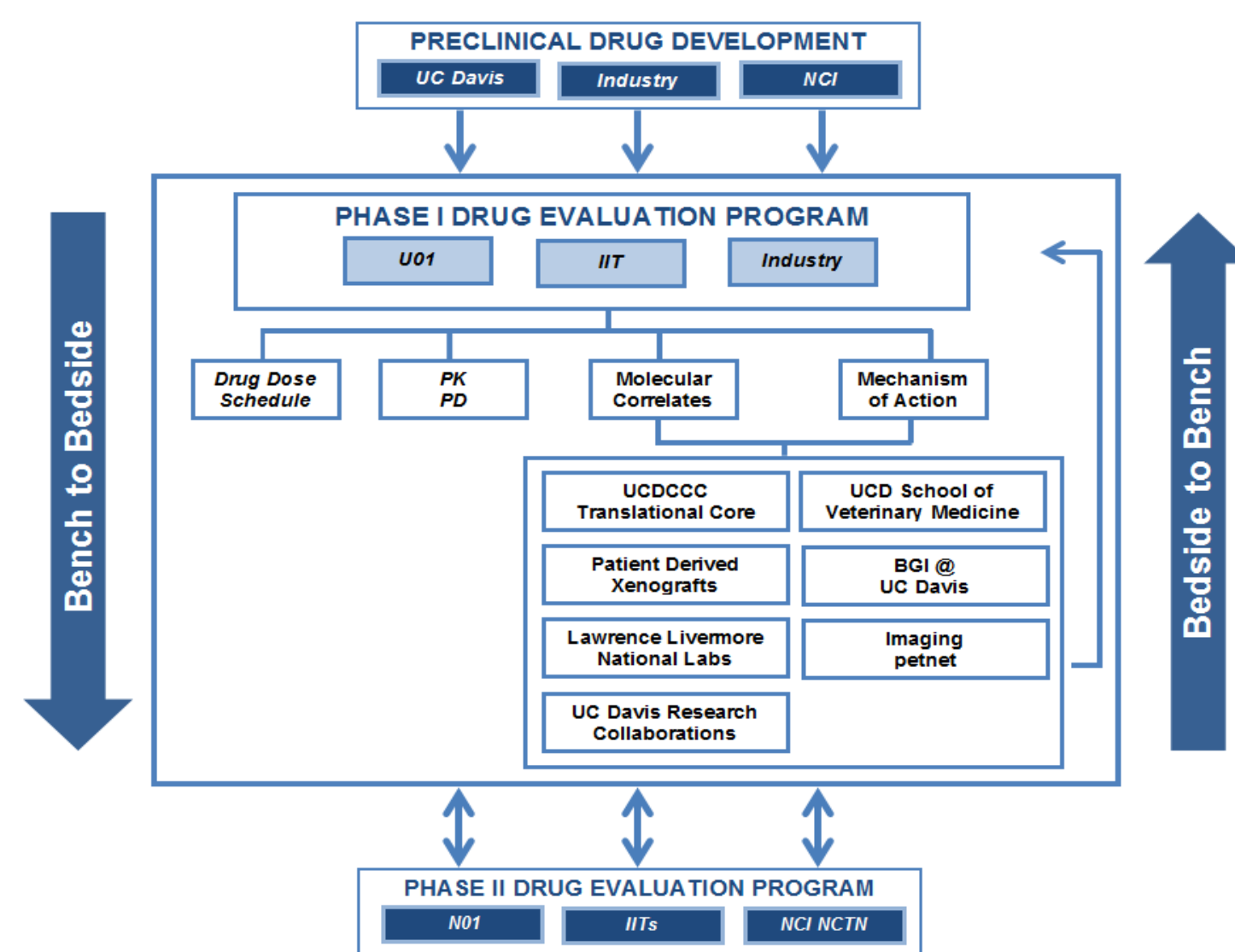


Figure 1. Bench to Bedside Research

SCIENTIFIC STRENGTH

We identified unique attributes of our campus. As illustrated in Figure 2, there are very few NCI Designated Cancer Centers that have a Good Manufacturing Practices (GMP) Facility and even fewer who hold NCI contracts for Phase I (U01) and Phase II (N01) clinical trials. We are fortunate to have strong scientific collaborators with our NIH top-ranked Vet School, a US National laboratory (Lawrence-Livermore) and the NCI Designated basic science cancer center, the Jackson Laboratory satellite facility in Sacramento. The UC Davis Health System is also the new US home for the Beijing Genome Institute and a world class molecular imaging facility.

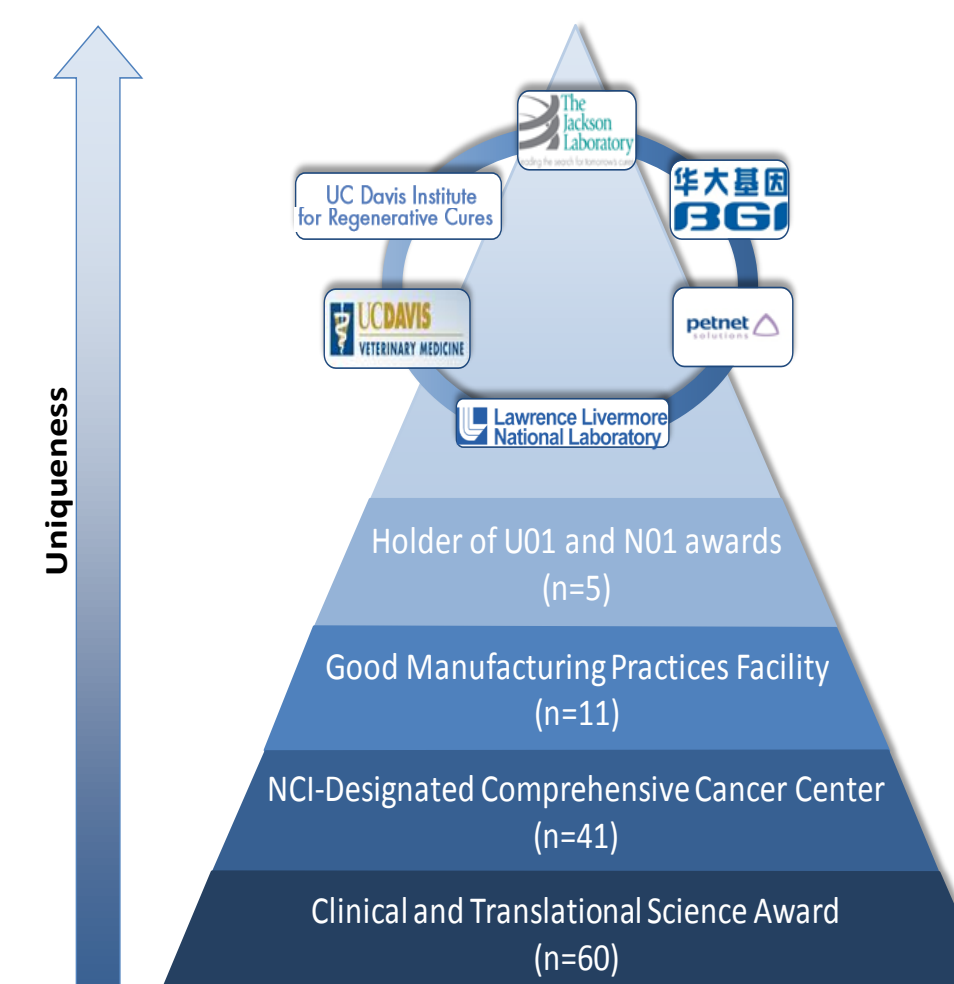


Figure 2. UC Davis unique attributes (parentheses indicate the number of academic institutions with those attributes).

FACULTY

A superb group of clinical faculty make up the Phase I team. A total of 6 clinicians are dedicated to phase I clinical research in solid tumors including the recent recruitment of two junior faculty members, one from the University of Michigan and the other from Stanford University. Additionally, our Phase I team is fortunate to have a hematologist who is conducting phase I trials in hematologic malignancies. Overall, the faculty have over 35 years experience conducting phase I trials across all cancer types.

INFRASTRUCTURE

Limited infrastructure exists to support the current program. The following essential elements are needed to enhance the program.

- A dedicated Phase I research team that can support the rapid pace of Phase I trials will need to be expanded from 4 to 14
- Institutional commitment to expedited processing through the IRB, budgets and contracts within 90 days from protocol submission (a key characteristic of all Phase I programs is fast trial activation times).
- Dedicated infusion space and nurses with the capacity for 12 hour days and a weekend schedule
- Expansion of the specimen processing lab
- PK/PD core facility

METRICS

The primary metric will be to increase the number of Phase I clinical trials to >25 trials always activated and an accrual goal of ≥ 150 patients/year. Additional metrics include increasing the number of publications and grants funded.

OUTSIDE CONSULTATION

A formal evaluation of our program was conducted by a Phase I clinical trial expert who stated that UC Davis has the potential to be a major player in the Phase I field.

RESOURCE COSTS

This table shows the additional resources needed.

	2013/14	2014/15	2015/16
Clinical Research Staff	\$745,093	\$1,046,018	\$1,112,804
Operational Expenses	\$27,750	\$14,020	\$11,299
Institutional Staff (IRB & Contracts)	\$51,800	\$54,482	\$57,257
PK/PD Director and Staff	\$120,950	\$120,950	\$120,950
PK/PD Operating Expenses	\$659,000	\$26,000	\$26,000

REVENUE PROJECTIONS

	2013	2014	2015
Phase I Industry Trials ^a	\$520,000 (N=40)	\$803,400 (N=60)	\$1,071,200 (N=80)
Phase I Investigator Initiated Trials Industry Supported ^a	\$220,000 (N=40)	\$226,600 (N=60)	\$233,398 (N=80)
Patient Payments ^b	\$1,959,300 (N=100)	\$2,449,125 (N=125)	\$2,938,950 (N=150)

^aBased on median per patient budgets from 4 phase I trials.

^bThese projections are based on several assumptions:

1. Patients entering phase I trials have exhausted all standard of care treatment options therefore any additional treatment and evaluation generates revenue.
2. Payments and charges were obtained on 2 patients that represent typical phase I trials treated between 2011-2012 to ensure all payments were collected.
3. The first patient with Medicare received three cycles of treatment and the second patient with private insurance received six cycles of treatment.
4. The net revenue, which includes hospital and professional fees, was \$17,506 for Patient #1 and \$21,692 for Patient #2. The average was \$19,533.

SUMMARY

A strategic planning document was prepared, edited and reviewed by stakeholders. The recommendation from the stakeholders is for approval and resources for expansion. In May, the plan will be presented to the UC Davis Leadership (Figure 3).

Meanwhile, the Phase I Program continues to focus on increasing the number of phase I trials conducted, identifying new opportunities for collaboration.



Figure 3. Strategic Plan