CTTP:
Cancer Therapeutics Training Program

A new CPRIT-funded training program organized under the auspices of the GCC for Innovative Drug Discovery and Development (IDDD) and its core facilities to support drug discovery and development research in Texas

Goal: To prepare postdoctoral scientists for careers in academic and/or commercial cancer therapeutics R&D

Background

- Needs Assessment Survey of > 200 postdocs participating in GCC-IDDD Programs, faculty labs and core facilities - 61 respondents
- 95% identified significant deficits in the training and resources at their individual institutions as impediments to their current cancer therapeutics research.

Training needs identified included:

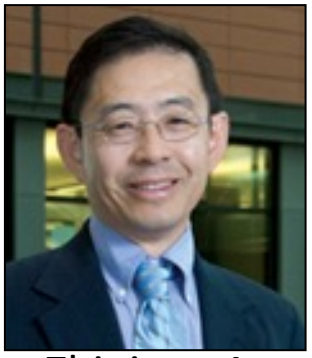
1) Fundamentals of drug discovery and development research
2) Introduction to specialized equipment and technologies
3) Increased opportunities for collaboration and networking
4) Participation in programs to support career development

CPRIT Training Grant Leadership Team

Peter Davies
IBT / TAMU

Wenshe Liu
TAMU

Suzanne Tomlinson
GCC



Zhiqiang An
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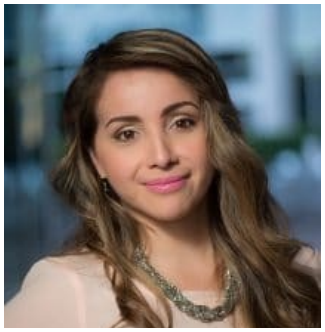

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Steering Committee (IDDD)

Zhiqiang An (UT Health)
Scott Gilbertson (U of H)
Dong Liang (TSU)
Wenshe Liu (TAMU)
Cliff Stephan (IBT/TAMU)
Suzanne Tomlinson (GCC)
Stan Watowich (UTMB)
Damian Young (BCM)

TBN (MDACC)

CTTP Training Program Overview

Guiding Principal: *To provide CTTP Trainees with a broad – based introduction to the principles and practical aspects of cancer therapeutics R&D while minimizing disruption of their post-doctoral research activities.*

1. **Cancer Therapeutics Research Program**
2. **Instructional Curriculum**
3. **Career Development Program**

Training Program

1. Cancer Therapeutics Research Program

- **Co-mentored research project(s) in cancer therapeutics research and/or development**
- **Core Lab Rotation (4 - 8 weeks) - Hands-on training in resources and technologies to support Cancer Therapeutics R&D**

Table I CFSA Drug Discovery and Development Core Laboratories

CFSA Core Facility	PI & Institution	Hands-on Training during Trainee Rotations
Combinatorial Drug Discovery Program *High-throughput library screening services*	**Peter Davies** Texas A&M	Techniques for monolayer, suspension and cancer cell organoid cell culture; high-throughput and high content screening assay development; laboratory automation technologies; endpoint detection assays; statistical analysis of quality control and library screening data.
Preclinical Candidate Discovery Core *DNA-encoded chemistry technologies for preclinical leads*	**Martin Matzuk** BCM	DNA-encoded chemistry technology (DEC-Tec) library synthesis; DNA-compatible chemical reactions; hit to lead medicinal chemistry; application of HPLC, LC-MS and NMR to compound purification, analysis and characterization;
Center for Advanced Microscopy and Image Informatics *Light microscopy imaging and informatics*	**Mike Mancini** Texas A&M & BCM	Application of confocal, deconvolution, high throughput microscopy, super resolution microscopy live imaging to cancer therapeutics research; multiplex single cell analytics using multi-mode detection systems iImage analysis instruction in open source software (Cell Profiler, ImageJ, FIJI).
Center for Comprehensive PK/PD and Formulation *small molecule PK/PD and formulation profiling*	**Dong Liang** TSU	Pre-formulation characterizations including pKa, logP and solubilities; In vitro drug metabolism studies; plasma protein binding studies; in vivo PK studies in animal models. ; bioanalytical method development for quantification of drug concentrations in plasma advanced pharmacokinetics and pharmacodynamic (PK/PD) modeling.
High-throughput Flow Cytometry Core *High-throughput flow cytometry – based library screening*	**M. Moczygemba** Texas A&M–	hHgh-throughput (HT) screening assay development for immuno-oncology assays; analytic flow cytometry; laboratory automation technology; quality control and reproducibility statistics; high-throughput data analysis
Advanced Cancer Antibody Drug Modalities Core Facility *Antibody engineering technologies*	**Zhiqiang An** UTHSC-H	screening of phage-displayed antibody libraries; Affinity maturing antibodies: Humanizing animal antibodies; Engineering bispecific antibodies and antibody-drug conjugates (ADC); Measuring antibody-antigen interactions; automated bacterial colony picking procedures
Texas A&M Drug Discovery and Synthesis Center *phage-displayed cyclic peptide libraries*	**Wenshe Liu** Texas A&M	Use of genetically encoded phage display for peptide library synthesis; Computer-aided drug design; Hit-to-lead medicinal chemistry; HPLC , LC-MS, NMR, flash purification system for compound purification, analysis and characterization; Protein crystallography; flow cytometry.
Business-Driven Accelerator for Cancer Therapeutics *integrated training and resources, to advance cancer therapeutics into clinical trials*	**Tom Luby** TMC	For description of elective Internships in Commercialization Offices and Companies see Training Plan Section XXX

Training Program

2. Instructional Curriculum

- **Foundations of Cancer Therapeutics Research - Crash Course**
  - 2 weeks (Aug. 16 - 27)
- **Advanced Courses (Elective) - to audit as needed**
- **IDDD Roundtable Workshops**
  - Monthly (2 hrs) –Workshops on latest advances in therapeutics R&D

Representative Therapeutics Workshops - 2019 – 2020 (Total =12)
Focus on the End Game: Developing a Valuable Target Product Profile (TPP) Brett Cornwell, Ex. Dir., TAMU Technology Commercialization & Phil Jones, Head, Inst. Applied Cancer Science (IACS) at MD Anderson
High Throughput Screening (HTS): A discussion of HTS resources, applications, and best practices Douglas Auld, Sr. Investigator, Novartis Institutes for Biomed. Res. & Cliff Stephan, Director GCC Combinatorial Drug Disc. Program
Emerging Screening Technologies: DNA-encoded libraries and fragment-based approaches for screening Lisa Marcaurelle, Dir. Chemistry, GlaxoSmithKline & Damian Young, Center for Drug Discovery, Baylor College of Med.
Computational Drug Discovery and Lead Optimization: use of with transformative physics and machine learning-based computational modeling Matt Repasky, VP Life Sciences Products, Schrödinger & Jason Cross, Structural Chemistry Lead, IACS
Therapeutic Antibody Drug Discovery and Development: challenges and opportunities Ross Chambers, VP of Antibody Discovery, Integral Molecular & Zhiqiang An, Dir. Texas Therapeutics Institute
Medicinal Chemistry in Lead Optimization: Targeted protein degradation and glutaminase addition in cancer: development of a GLS1 inhibitor Andy Phillips, Pres. & CEO, C4 Therapeutics & Michael Soth, Institute Group Leader in Medicinal Chem., IACS
Starting a Biotech Company: a discussion of successes and challenges with academics and local entrepreneurs Brittany Barreto, Capital Factory; Bala Raja, Luminostics; Donna Chang, Hope Biosciences; Shautong Song, Icell Kealex; and Magnus Hook, TAMU IBT
Lessons in Biotech Leadership: Challenges of translating therapeutics from an academic setting to industry, Peter Hoang, President & CEO, Marker Therapeutics & Gaylen Paulson, As. Dean and Dir. TX Exec. Education, McCombs School of Business, UT Austin

Training Program

2. Instructional Curriculum - Core Competencies

- **Responsible Conduct of Research Certification (if needed)**

- **Rigor & Reproducibility Workshop**
  - 1 day GCC workshop offered 2x per year

- **Diversity, Disparities and Community Engagement Workshop**
  - New 1 day workshop offered 2x per year being developed by GCC/TSU/UofH

Training Program

3. Career Development Program

- **IDDD Careers Roundtables (monthly) –** Networking sessions
- **CTTP trainee meetings (monthly)**
- **Career/skills building workshops at trainee institutions (elective)**
- **Research presentations at local and national conferences**

IDDD Annual Conferences 2015 -2020 (Total =6)
Recent Advances in the Development of Combinatorial Therapies for Cancer Peter Davies and Clifford Stephan, Institute of Biosciences and Technology - Texas A&M Health Science Center (IBT/TAMU)
Fragment-Based Drug Discovery Philip Jones, MD Anderson; Damian Young, Baylor College of Medicine (BCM); and Kevin Dalby, UT Austin
Imaging-based Single Cell Analytics: Applications for Cancer Cell Biology and Therapeutics Michael Mancini, BCM; David Andrews, University of Toronto; Peter Davies, IBT/TAMU, Fabio Stossi, BCM
Innovations in Drug Discovery and Development Philip Jones, MD Anderson; Suzanne Tomlinson, GCC; Stan Watowich, UTMB

CTTP Trainees

- **For Year 1, goal is to enroll up to 12 Postdoctoral trainees**

- **Eligibility:**
  - **Must be enrolled in a GCC member institution** (Texas A&M/IBT, Rice Univ, MD Anderson Cancer Center, Univ of Houston, UTMB, UT-Health; Baylor College of Medicine) or **one of the CTTP partner institutions** (Texas A&M Univ, Texas Southern Univ)
  - **Must have completed their doctoral degree and be engaged in post-doctoral training (1st, 2nd or 3rd year of training)**
  - **May be US Citizens, Permanent Resident or a Foreign National** with a current visa that allows for postdoctoral training
  - **Must be engaged in some aspect of cancer therapeutics research and/or development**

CPRIT CTTP Fellowship Awards

- CPRIT CTTP Training Grant Award provides funding for up to 8 post-doctoral fellowships per year (4 in year 1; 8 in years 2-5)

- CPRIT Fellowship Awards are limited to CTTP Trainees working with faculty in the 4 CTTP "Partner" Institutions
  - Texas A&M Univ and Texas A&M/IBT
  - Texas Southern Univ
  - Baylor College of Medicine
  - UT Health – Houston

- CPRIT Fellowship Awards provide NRSA-level postdoctoral fellowship salary support for 1 year and are renewable for a 2nd year based on research progress and adherence to CTTP requirements

Application Timeline

How to Apply

Information and training application form will be posted on **GCC CTTP website**

Call for applications	June 10
Letter of Intent due	June 20
Applications due	July 8
Selection of CTTP Trainees announced	July 14
Applicants for CPRIT Fellowships notified about interview	July 14
Interviews for CPRIT fellowships	July 23
Selection of CPRIT fellows announced	July 25
CTTP Start Date	**August 1**

Application and Selection Process for CTTP Trainees and Fellows

PART 1 – all CTTP Trainee Applicants will provide:

- Project Description
- Mentoring Plan
- Career Goals
- CV, Resume (Trainee and Mentor(s))
- List of Publications (Trainee and Mentor(s))
- Recommendation letters from primary mentor and co-mentor

PART 2 - Additional information for CPRIT CTTP Fellowship Award Applicants

- 2 additional recommendation letters
- For non-US citizens, documentation of work visa status

Application review

- **CTTP Steering Committee will review CTTP Trainee and Fellowship Applications**
  - Up to 12 CTTP Trainees will be selected from applications
  - Qualified CTTP Trainees applying for Fellowship awards will be selected for interview
  - For Year 1 up to 4 qualified Fellowship applicants will be selected for CPRIT CTTP Fellowship Awards

Questions?

Leadership Team

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Application Questions:

Vanessa Herrera, vch3@rice.edu

Figure 5 Hypothetical Timetable for CTTP Trainee Activities	
Year 1	**Year 2**
Year Round Activities ***Mentored Research Project (Full time)*** ***(Monthly) IDDD Therapeutics Workshop; CTTP careers Roundtable; "Post-doc" Only Meeting***	
Summer 1 ***Fundamentals of Cancer Therapeutics (2 weeks)*** ***Research Conference 1 (2 day)***	**Summer 2** ***Rigor and Reproducibility Workshop (1 day)*** ***Research Conference 2 (2 day)***
Semester 1 ***Elective Graduate Course 1 (3hrs/week, 3 months)*** ***Skill Building Workshp 1 (2 day)***	**Semester 3** ***Elective Graduate Course 2 (3hrs/week, 3 months)*** ***Diversity Workshop (1 day)***
Semester 2 ***Rotation / Internship 1 (1/2 time, 4-8 weeks)***	**Semester 4** ***Rotation / Internship 2 (1/2 time, 4-8 weeks)*** ***Skill Building Workshp / Grants 101***