Purpose: The purpose of the one-week Institute is to provide an overview of translational research methods and research career development opportunities supported by Dartmouth SYNERGY: The Dartmouth Clinical and Translational Science Institute. The program is intended to function as a “springboard” for early career investigators to acquire a basic understanding of the fundamentals of translational research and career development strategies that will help them to launch a successful translational research career. The curriculum is based on summer research institutes for early career investigators that have resulted in increased rates of achieving funding for K awards or first R01 grants. The Institute format combines didactic lectures, panels, small group breakout sessions, and individual presentations.

Objectives: Institute participants will learn about core areas and methods in translational research; establish new collaborations and potential mentoring relationships; learn about SYNERGY resources and programs designed to support early career research development; receive individualized feedback on a developing pilot study proposal, early career investigator proposal, or other research project plan; and receive guidance on strategies and local resources for early career research development.

Faculty will foster translational collaborations and mentoring relationships; help investigators develop a peer-reviewed translational research grant proposal; circulate examples of all pieces of a grant proposal as a model; build a support network to foster recruitment/retention of early career investigators.

Outcomes: Anticipated outcomes include: (1) identification of early career investigators at Dartmouth who have an interest in translational research; (2) identification of mentors, and facilitating matching with a mentor for those in need; (3) future successful applications by graduates of the Institute for internal early career development awards (e.g., SYNERGY Translational Pilot Awards or Hitchcock Scholar Awards or Pilot Grants); and (4) future applications from graduates of the Institute resulting in externally funded career development (K) or research project (R) awards.

Requirements for Program Attendance

- Nominee must be an early career investigator (MD, DO, PhD, or DNP). Postdoctoral fellows are not eligible.
- Nomination by a Department or Center Chair (each Department or Center to nominate 1–4 participants).
- Commitment of Support (one-week release time for participant) by Department or Center Director.
- Application documenting nominee’s interest in leading a translational research study.
- Outline of a topic of interest or draft of a proposal for a future translational grant application.

Structure

Morning: Translational Research Methods

- Format: large lecture.
- Topics: research methods and related resources for translational research at Dartmouth.
- Presentations: didactic with investigator research as examples.
Late Morning: Grantsmanship for Translational Research and Career Development

- Format: large lecture and workshop
- Focus: early career development, grant development, and mentoring

Lunch (provided by SYNERGY): Scientific Autobiography or Networking

- Format: large group lecture and discussion presented by a leading translational researcher at Dartmouth.

Afternoon: 1:00–4:00: Individualized Workshops in Translational Science Grantsmanship

- Format: Break out into small groups of 4-6 students with a senior faculty leader. Groups assigned according to research interest stated in application. Early career investigators will present their developing ideas for K awards or first R grants in a small group format that includes feedback from leaders and peers. The intent of this component is to provide individualized assistance in helping each participant to start the process of clearly formulating a research question, hypothesis, and basic approach.
**DAY 1**

**Day 1 Learning Objectives/Morning**
1. To learn about SYNERGY resources and award mechanisms.
2. To establish a common translational research vocabulary, including major study designs, data types, and T1–T4 research methods.
3. To develop an understanding of T2 translational research and large randomized clinical trials.
4. To develop skills in scientific writing and grantsmanship, focusing on the Hypothesis and Specific Aims sections.
5. To develop skills in self-presentation and learn about fellow students.

**Schedule for Day 1**

**8:00-8:15 Introduction to SYNERGY**
- Training program, resources
- Internal career development award mechanisms: SYNERGY Scholars and Hitchcock Scholars programs

**8:15-9:15 Career Development**
- Developing yourself as a Candidate
  - Where have you been?
  - What are your goals and how does research project fit?
  - **Introduction of Students and Research Foci**—you and your topic of research interest

**9:15-9:30 Break**

**9:30-10:00 Statistical Methods and Approaches**
- Accessing the SYNERGY Statistician Core
- Sample size / power calculations—preliminary data needed, budgetary constraints
- Describing statistical content in grants and papers

**10:00-11:00 T2 Translational Methods Introduction**— (Translation to Large Groups of Patients, Large Surgical Intervention Studies)

**11:00-11:15 Break**

**11:15-12:00 Grantsmanship: Hypothesis Development, Specific Aims**
- Developing your hypotheses and research questions
- Specific Aims and Impact Grant Opportunities at NIH
- What is “Significance”?
- What is “Innovation”?  

**12:00-12:15 Break**

**12:15-1:00 Lunch and Scientific Autobiography**
1:00-4:00 Small Group Breakout Session: Hypothesis Development and Specific Aims

**Learning Objective:** To engage with clinical and research faculty conducting translational research and gain feedback on an individual grant or K award, including the research question, hypothesis, and approach. Each breakout session will have no more than 6 participants. Participants will present their developing ideas for K awards or first R01 grants in a small group format that includes feedback from leaders and peers. Each student will prepare a 10-minute PowerPoint slide presentation and be prepared to introduce the grant and today’s specified elements (hypothesis development and specific aims) followed by 20 minutes of discussion and feedback from senior leader and peers for each student.

**Homework:** Revise grant proposal pieces and presentation.
Day 2 Learning Objectives / Morning
1. To develop an understanding of T1 translational research—i.e., to learn methods of moving basic science observations into primary human populations and tissues.
2. Learn the components of the significance, innovation, and environment sections of a grant.
3. Understand intellectual property issues pertaining to your research ideas.
4. To learn statistical analytic approaches for the development of an effective statistical analysis section tied to the specific aims and hypotheses.

Schedule for Day 2
8:00-8:05 T1 & T2 Research Orientation

8:05-9:00 T1 Translational Methods Introduction – (Translation to Humans)
9:00-9:15 Break

9:15-9:45 Selling the Significance and Innovation of Your Research to Reviewers
   • Writing your Approach section
   • Pitfalls and alternative approaches

9:45-10:15 Intellectual Property
   • How much should I share?
   • When do I file?

10:15-10:30 Break

10:30-11:00 Introduction to the Translational Research Continuum
   • T1: translating basic science -> Phase I and Phase II small clinical trials (<100 patients).
   • T2: Phase III/IV large clinical trials, observational studies with new markers.
   • T3: Apply to real world—evaluate in clinical practice, implement behavior change. Observational studies of clinically used markers.
   • T4: Implement and evaluate new nationwide/global policies—how to promote and evaluate use to improve health of populations.

11:00-11:30 Institution and Environment
   • Negotiating and demonstrating institutional support
   • Components of the “Environment” statement
   • “Resource Sharing” statement

11:30-12:00 Non-traditional funding sources: Foundations and Societies

12:10-1:00 Lunch and Networking

1:00-4:00 Small Group Breakout Session: Significance and Innovation of Your Research
**Learning Objective:** To engage with clinical and research faculty conducting translational research and gain feedback on an individual grant or K award research question, hypothesis, and approach. Each breakout session will have no more than 6 participants: Participants will present their developing ideas for K awards or first R grants in a small group format that includes feedback from leaders and peers. Each student will prepare a 10-minute PowerPoint slides to introduce the grant and today’s specified elements (significance and innovation of your research) followed by 20 minutes of discussion and feedback from senior leader and peers for each student.

**Homework:** Revise grant proposal pieces and presentation.
DAY 3

Day 3 Learning Objectives/Morning

1. To develop an understanding of T3 translational research—i.e., to learn how to evaluate and transmit evidence-based guidelines in real world health practice, through delivery, dissemination, and diffusion research.
2. To identify ways to implement novel methods and refine the approach to translational research projects.
3. To develop the skills for scientific writing and grantsmanship.

Schedule for Day 3

8:00-8:05  T3 Research Orientation

8:05-9:00  T3 Translational Methods Introduction

9:00-9:15  Break

9:15-10:15 Community Engagement

10:15-10:30 Break

10:30-11:45  Writing: Style Suggestions from an Editor
  Writing style and tense
  What elements are out of place?
  Workshop: share and edit grant sections, focus on style

11:45-12:15 Break

12:15-1:00 Lunch and Scientific Autobiography

1:00-4:00 Small Group Breakout Session: Writing Your Research Approach

Learning Objective: To engage with clinical and research faculty conducting translational research and gain feedback on an individual grant or K award research question, hypothesis, and approach. Each breakout session will have no more than 6 participants: Participants will present their developing ideas for K awards or first R grants in a small group format that includes feedback from leaders and peers. Each student will prepare a 10-minute PowerPoint slides to introduce the grant and today’s specified element (research approach) followed by 20 minutes of discussion and feedback from senior leader and peers for each student.

Homework: Revise grant proposal pieces and presentation.
DAY 4

Day 4 Learning Objectives /Morning
1. To learn about implementation research and see examples from Dartmouth investigators.
2. To learn about ethics and applying to the Committee for Protection of Human Subjects at Dartmouth. To understand how to write an IRB application for your grantidea.
3. To learn about creating, your CV, biosketch, budget and budget justification.
4. To learn how to design a research database and use electronic health records in translational research.

Schedule for Day 4

8:00-8:05 T4 Research Orientation

8:05-9:00 Innovation Implementation and Applied Healthcare Delivery Science

9:00-9:15 Break

9:15-9:45 Ethics/IRB (CPHS)
   - Ethical and Regulatory Aspects of Clinical Research
     ■ Purpose and function of IRBs
     ■ Study types—local examples and IRB requirements
     ■ Informed consent and special populations

9:45-10:15 Preparing your CV and NIH biosketch
   - Writing the Personal Statement for your biosketch
   - Choosing and presenting your Contributions to Science
   - What should go into your CV?

10:15-10:30 Break

10:30-11:00 Budget Calculations and Justification

11:00-11:45 Research Partnerships with Industry

11:45-12:00 Break

12:00-1:00 Lunch Lecture: Designing Research Databases and Working with Electronic Health Records

1:00-4:00 Small Group Breakout Session: Final Presentations

Learning Objective: To engage with clinical and research faculty conducting translational research and gain feedback on an individual grant or K award research question, hypothesis, and approach. Each breakout session will have no more than 6 participants. Participants will present a 10-minute PowerPoint summary of their polished grant (specific aims, hypotheses, significance, innovation, and approach) with 20 minutes of discussion and feedback from senior leader and peers for each student.
Day 5 Learning Objectives
1. To learn characteristics of effective mentors and managing the relationship.
2. To develop an understanding for critical appraisal of scientific grants through observation of a mock NIH study section, which will provide a realistic perspective on an actual NIH or NSF grant study section.
3. To develop an understanding of T4 translational research—i.e., to learn methods to promote and evaluate policy and population-level health outcomes.
4. To share experiences of other investigators who have recently launched their research careers.
5. To learn about the editorial process for journals and manuscripts.

Schedule for Day 5
8:00-9:00 Mentoring—Office of Research Mentoring
   • Choosing and working with a mentor; managing the relationship

9:00-10:15 Mock Study Section
   • Comments on choosing study sections

10:15-10:30 Break

10:30-11:00 T4 Translational Methods Introduction

11:00-12:00 Finding the balance two discussion groups:
   • Clinician researchers
     o Negotiating research time; funding early research; life-work balance
   • PhD researchers
     o Teaching, grants, committee work; life-work balance

12:00-1:00 SYNERGY Networking Lunch—for all faculty and student participants of the Certificate Program

1:00-1:45 “The Editor is In”: Questions and answers on the editorial process

1:45-2:00 Program Feedback

2:00 Presentation of Certificate Awards