Summer Research Scholars Program
The Lillehei Heart Institute is proud to announce its annual summer research scholarships in cardiovascular medicine. These highly competitive, prestigious scholarships are designed to expose highly qualified students to several disciplines within cardiovascular medicine. The major focus will be intensive basic or clinical research as each scholar will be assigned a laboratory and a faculty mentor. In addition, scholars will be introduced to clinical, industrial, and academic medicine through a variety of field trips, seminars and hands on experiences. Weekly seminars by faculty and industry leaders will be given to offer the scholar a window into career opportunities in cardiovascular science and medicine. The goal of these scholarships is to encourage medical and scientific careers in Cardiovascular Medicine.
2 PROGRAM MENTORS & LECTURERS

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The summer research program at the Lillehei Heart Institute completely opened my eyes to the vast world of cardiac research. Specific to my experience, I had a full and meaningful experience in clinical research; from choosing my project, creating a plan, constructing the tools to measure my data, and working in the clinic to see my patient population first hand. My internship has inspired and motivated me to continue the meaningful work LHI has prepared me to do.

- Siri Freeh, Scholar 2013
**Michael Kyba, PhD**
Director, Lillehei Heart Institute Summer Research Scholars Program
Professor, Division of Pediatric Blood & Marrow Transplantation
Carrie Ramey/Children’s Cancer Research Fund Endowed Professor
Lillehei Heart Institute

**Samuel C. Dudley, MD, PhD**
Fred C. and Katherine B. Andersen Chair - Adult Cardiology
Professor and Chief, Division of Cardiology
Director, Lillehei Heart Institute

**Daniel J. Garry, MD, PhD**
Professor of Medicine
St. Jude Medical Endowed Chair in Cardiovascular Sciences
Director, Regenerative Medicine & Sciences Program
Director, Paul & Sheila Wellstone Muscular Dystrophy Center
Mary G. Garry, PhD
Associate Professor
Cardiovascular Division
Lillehei Heart Institute

Rita Perlingeiro, PhD
Professor of Medicine
Lillehei Professor in Stem Cell &
Regenerative Cardiovascular Medicine
Lillehei Heart Institute

Dawn A. Lowe, PhD
Associate Professor, Program in Physical Therapy
Department of Physical Medicine & Rehabilitation

Joseph Metzger, PhD
Professor and Chair
Department of Integrative Biology & Physiology (IBP)
Maurice B. Visscher Endowed Chair in Physiology

Rita Perlingeiro, PhD
Professor of Medicine
Lillehei Professor in Stem Cell &
Regenerative Cardiovascular Medicine
Lillehei Heart Institute
“Working with my LHI Scholar (Keshav) was like working with uncontainable enthusiasm and a knowledge sponge - I just connected him and moved out of the way - it is what I hope for in every researcher in my lab!”

Dr. Robert TRANQUILLO, Mentor

DeWayne Townsend, DVM, PhD
Associate Professor
Department of Integrative Biology & Physiology (IBP)

Robert Tranquillo, PhD
Distinguished McKnight University Professor
Department Head, Department of Biomedical Engineering

Jop van Berlo, MD, PhD
Lois and Richard King Assistant Professor
Lillehei Endowed Scholar
Lillehei Heart Institute
The Lillehei Heart Institute Summer Research Scholars program was a truly rewarding experience that immersed me in the process of scientific discovery and inspired me to pursue a future in cardiovascular medicine. The program presented invaluable opportunities for me to perform research on muscular dystrophy under the guidance of an experienced mentor and also interact with medical professionals to learn about various career paths. By the end of the summer, I had not only strengthened my independent critical thinking skills and professionally presented my work at a poster session but also made great connections and friends that I hope will persist for a long time.

- Courtney Connolly, Scholar 2013

**ACTIVITIES**

8 FIELD TRIPS

11 GUIDED DISSECTION

12 LUNCH & LEARN

CARDIOVASCULAR RESEARCH RETREAT
The Advanced Preclinical Imaging Center (APIC) is a state-of-the-art innovative research facility within the Lillehei Heart Institute (LHI) of the University of Minnesota. It serves as a core translational laboratory and training facility to stimulate discovery and advancement in the fields of cardiovascular and neurological science, interventional radiology, and biomedical engineering. The APIC inspires and facilitates interdepartmental relationships and novel scientific achievements that fully advance LHI’s mission to serve as the world’s premiere campus for education and research dedicated to cardiovascular health.
The Visible Heart® allows for visualization of the inner workings and anatomical features of a beating heart through the use of a clear blood-like solution and an isolated heart apparatus. The creation of internal images is only one facet of this multidisciplinary project. The Visible Heart® lab has published in peer-reviewed scientific journals on the merits of using an isolated large mammalian heart maintained with a clear perfusate. The preparation can function in modes appropriate for research in cardiac anesthesiology, cardiology, electrophysiology, and cardiac surgery. Additionally, this large mammalian isolated working heart also serves as a model for evaluating therapies targeted at improving cardiac performance following acute myocardial infarction, bypass and/or transplant procedures.
Lunch and Learn

A weekly lunchtime lecture series, Lunch & Learn, provides an opportunity to learn about career options in the fields of Medicine and Research. The series cover a wide range of topics including the History of the Lillehei Heart Institute, tips on how to function in a lab, advice for getting into medical school, and talks from Lillehei Heart Institute faculty about personal experiences within a chosen field.

Program Lecturers

Cyprian Weaver, PhD, PhD
Associate Professor of Medicine,
Cardiovascular Division
Lillehei Heart Institute

Ranjit John, PhD
Assistant Professor,
Division of Cardiothoracic Surgery
Surgical Co-Director,
Ventricular Assist Device Program
Guided Dissection

A guided heart dissection provides each scholar with an up-close and personal view of the heart. St. Jude Medical provides each scholar with a porcine heart and individual work stations. St. Jude staff discuss each step of the dissection, providing an integral, hands-on view of the anatomy of the heart and differences between the porcine and human heart.
Cardiopalooza
Cardiovascular Research Retreat

Cardiopalooza is the Lillehei Heart Institute’s annual research retreat, usually held in July. The retreat includes a poster session, talks by U of M researchers, faculty breakout sessions and a BBQ. It is a great opportunity for collaboration and networking in a relaxed environment. The purpose is to inspire new ideas and promote cross-disciplinary collaboration. The Cardiopalooza poster session is a judged presentation, Scholars compete against their peers and other undergraduate researchers at the Lillehei Heart Institute.

2012 Winner: Monica Knaack
mentor: Dave Thomas

2013 Winner: Courtney Connolly
mentor: James Ervasti

2014 Winner: Jared Matzke
mentor: Dave Thomas

2015 Winner: Pa Nhia Moua
mentor: Joe Metzger

2016 Winner: Hyun Cho
mentor: David Thomas

2017 Winner: Karena Lin
mentor: Rita Perlingeiro

Though the poster session is also open to undergraduate college students outside the Scholars program, four years in a row students from the LHI Scholars Program - three of them high school seniors - have won the event.
Fun in the Twin Cities!

Team Building through R&R

We recognize that our scholars sometimes need a break from their busy schedules to relax and have fun as a group. There are lots of opportunities on and off-campus for a little recreation.

Besides providing some much-needed stress relief, these fun group activities also teach valuable networking skills needed for success in the sciences. Sometimes the best solutions come from collaboration with new colleagues who lend a fresh perspective. These collaborations happen more often in a social context, rather than while holed up in the lab. Positive social interactions also foster trust and cooperation within a team, important components of efficient and effective lab research.
The LHI Summer Research Program is a wonderful, holistic program that gave us not only the opportunity to carry out meaningful research, but also to interact with some of the best scientists and doctors in cardiovascular research. We gained practical lab experience and valuable connections in the field. I experienced things as diverse as preparing and presenting my research in poster form, visiting the Visible Heart Lab to see a heart reanimation and watching an open heart surgery. The Summer Scholars Program convinced me that a career in medicine is what I want to do.

- Emily Anne Kvasnicka, Scholar 2013

Application Information
Applying to the Summer Research Scholars Program

Applications are accepted from December 15 through February 15 each calendar year. The program normally begins on the first Monday in June.

Application

Applicants should submit the following list of items:

- Curriculum Vitae
- Copy of school transcript (official or unofficial)
- 2 letters of faculty recommendation
- Statement of interest in the LHI SRSP (paragraph)
- Brief statement of short term and long term goals

Eligibility

- Scholarships are open to high school students (ages 16 years or older, must be Junior or Senior and U.S. citizen) and undergraduate students enrolled in an accredited degree program in a health care related field.
- Scholarships are full time (40 hr/week, unless special arrangements have been requested and approved by the Director) and last 10 weeks in duration.

Compensation/Benefits

- Scholars will receive a stipend ($3000 for high school students and $4000 for undergraduate students).

Housing & Meals

- The SRSP does not provide meals or housing for participants.
- For applicants 18 years of age and older, accommodations in University of Minnesota residence halls are available at an extra cost. Contact the U of M Office of Housing and Residential Life for more info: University of Minnesota Housing and Residential Life website.
- For applicants under the age of 18, an adult chaperone is required for accommodation in University housing. The adult chaperone must live with the applicant and pay an additional cost. Alternatively, minor age applicants may make off-campus housing arrangements with family or friends in the area.

The LHI Summer Research Scholars Program provided me with great opportunities to learn advanced research techniques and share cutting-edge discoveries with my mentors.

-Yu Zhang, Scholar 2013
Instructions for Online Application

**z.umn.edu/lhischolarsapply**

Before you start the online application, you must have ALL of the following materials and information prepared:

- Your curriculum vitae (in MS Word or Adobe .pdf format)
- Your statement of purpose (in MS Word or Adobe .pdf format)
- Your statement of short- and long-term goals (in MS Word or Adobe .pdf format)
- Contact info for instructors submitting letters of reference

These required items may be submitted online:

- Your high school or university/college transcript (see section I, below)
- One or both letters of reference (see section II, below) in MS Word or Adobe .pdf format

**Additional Instructions**

I. If your school prefers to send transcripts directly, one may be sent:

- by email: lhi@umn.edu
- by fax: 612.301.8298
- by snail or express mail:
  LHI - SRSP
  2231 6th St SE, 4-165 CCRB
  Minneapolis, MN 55455

II. If one or both of your instructors prefer to submit a letter of reference directly, letters may be submitted:

- online: z.umn.edu/lhischolarsletters (instructors only)
- by email: lhi@umn.edu
- by fax: 612.301.8298
- by snail or express mail:
  LHI - SRSP
  2231 6th St SE, 4-165 CCRB
  Minneapolis, MN 55455

“The Lillehei Summer Scholars program took all the science I had learned in textbooks and lectures and put it into my hands. The knowledge and experience I acquired with my summer at Lillehei has given me appropriate and often essential background understanding for every science lecture and laboratory I have been in since the summer I spent there.”

- Matthew Schreier, Scholar 2012
I was accepted into the summer scholars program for the summer of 2011, where I worked under Dr. James Ervasti studying Duchenne muscular dystrophy. My specific project worked with the protein dystrophin, looking at how to create smaller constructs that could improve the livelihood of patients with this disease. This summer program not only gave me hands on experience in a molecular biology lab where I was able to complete my own project, but also allowed me to increase my networking skills by meeting several professionals in research and medical fields. To any student who is interested in science, research or a future in the medical field, I highly recommend applying for the summer scholars program because there is just no other program quite like this one.

-Vanessa Adamson, Scholar 2011
Is the program available to students who are not U.S. citizens?

Yes, but to undergraduate college students only. A J-1 visa will be required (at a cost of $600-700 payable by the applicant). Requirements for the J-1 visa include:

1. that the individual be covered by health insurance (purchased at the applicant’s expense through the U of M Office of Student Health Benefits, www.shb.umn.edu)
2. that the individual make a minimum of $1,300 per month.
3. that a letter justifying why the individual is coming to the U.S. be provided.

Contact International Student & Scholar Services [www.isss.umn.edu] for additional information about obtaining a J-1 visa.

What are the program dates?

The program usually runs from the first Monday in June until the first week in August. An orientation is scheduled on the Friday prior to the first Monday in June.

How many applications do you receive?

We typically receive between 150 and 175 applications each year.

How many positions are available?

There are nine undergraduate and three high school positions available.

Some exceptional applicants who do not make the initial cut will be notified of their placement on a waiting list, and may be offered a position at a later date should one become available.

Do you accept recent university graduates?

No, you must be currently enrolled as a junior or senior in high school or as a current undergraduate student (med students are not eligible). Applicants under the age of 18, please see the housing restrictions listed on page 28.

Will I receive confirmation that you have received all of my application materials?

Yes, you will receive a confirmation via email.

When can I expect to hear if I have been accepted?

Notifications of acceptance are sent the first week of March.

I have never before composed a curriculum vitae. Where can I find instructions and/or templates?

There are many examples available online; we do not require a specific format. Feel free to complete a search online for an example of a curriculum vitae. A standard resume is also acceptable.

I will be taking classes this summer. May I attend the SRSP while enrolled in other classes?

No, the Summer Research Scholars Program is a full time endeavor.

What are my options for housing if I’m not from the Twin Cities metro area?

For applicants 18 years and older, accommodations in University of Minnesota residence halls are available at an extra cost. Contact the University of Minnesota Office of Housing and Residential Life for more info: housing.umn.edu.

For applicants under the age of 18, an adult chaperone is required for accommodation in University housing. The adult chaperone must live with the applicant and pay an additional cost. Alternatively, minor age applicants may make off-campus housing arrangements with family or friends in the area.

Questions about the Letters of Reference
Letters of Reference

To whom (what name) should the letters of reference be addressed?
Letters of reference should be addressed to “Admission Committee.”

May I submit a letter of recommendation from a mentor in a research laboratory?
Letters of recommendations from a faculty mentor in a scientific laboratory are acceptable as long as the experience was recent and meaningful.

Can I submit letters of reference online?
Yes, you can either a) submit them with your other materials using the online application [z.umn.edu/lhischolarsapply], or b) have your instructor(s) upload letters via the letter submission form [z.umn.edu/lhischolarsletters].

Can letters of reference be emailed to lhi@umn.edu?
Yes; please attach the letter as a PDF document.

May I send letters of reference already used for other purposes, such as med school admission?
Yes, but keep in mind that these letters should contain pertinent information specific to the LHI Summer Research Scholars Program.

If I am currently an undergraduate, may my letters of reference be from my high school teachers?
No, letters of reference from current teachers are required.

How may an instructor submit a letter of reference to you directly?

- **Online**: z.umn.edu/lhischolarsletters (instructors only)
- **Email**: lhi@umn.edu
- **Fax**: 612-301-8298
- **Mailing address**:
  - LHI - SRSP
  - 2231 6th St SE, 4-165 CCRB
  - Minneapolis MN 55455

My instructor is required to send a hard copy. To what address should it be sent?

- **Mailing address**:
  - LHI - SRSP
  - 2231 6th St SE, 4-165 CCRB
  - Minneapolis MN 55455

The LHI Summer Research Scholars Program really helped me understand many of the career options available to students interested in science and medicine. Through the LHI Summer Research Scholars Program, I learned how to build professional relationships and present information in a clear and concise manner, both of which are important skills in every field.

- Keshav Mengalick, Scholar 2013