

- CC recognition program honors four NIH staff for dedication, compassion
- Mysteries of sleep explored with combined MRI, EEG information

Nobel Prize win for Building 10 Senior Scholar for Hepatitis C discovery



Traditionally, Nobel Laureate Dr. Harvey Alter would have traveled to Stockholm, Sweden to receive the prize, but due to the COVID-19 pandemic, the Nobel medal and diploma were presented to him a NIH Dec. 8 by the Swedish Ambassador Karin Olofstoter. At the event, Alter paid tribute to his wife, Diane Dowling, seen here. "I want to thank my main collaborator, the person who has never entered my lab but occupied my heart for the past 36 years. My Noble and Nobel wife, Diane."

It began with an early morning phone call. Instead of a telemarketer or an over-eager candidate jarring him out of bed, the Secretary General of the Nobel Committee in Stockholm, Sweden, was on the line informing Dr. Harvey J. Alter he was a co-winner of the 2020 Nobel Prize in Physiology or Medicine for his contributions to the discovery of the hepatitis C virus (<https://go.usa.gov/x7KWm>).

Alter, a Senior Scholar at the NIH Clinical Center's Department of Transfusion Medicine, has worked with NIH for more than 50 years. His research has focused on ways to enhance the safety of the blood supply.

He shares the award with Michael Houghton, Ph.D., from the University of Alberta in Canada, and Charles M. Rice, Ph.D., from Rockefeller University in New York City (www.nobelprize.org/prizes/medicine/2020). The Nobel committee characterized their work as "seminal discoveries that led to the identification of" the Hepatitis C virus.

Hepatitis C can inflame and damage the liver and can cause chronic liver dis-

ease, cirrhosis, liver failure or liver cancer. It is estimated to impact between two to three million Americans.

Alter's work began in the 1960s in the NIH Clinical Center's Blood Bank, studying transfusion associated hepatitis. Researchers at the time found that the blood of up to 30% of patients tested positive for hepatitis. They were able to identify some of the infections as either hepatitis A or hepatitis B virus, but there was a persistent component of the blood that indicated another, unidentified, pathogen. They called it "non-A, non-B" hepatitis.

Years of testing and experiments allowed Alter and his colleagues to narrow down the components of the disease.

"[W]e knew that the agent was small and lipid encapsulated, that it was blood transmissible, that it could be transmitted by asymptomatic 'silent' carriers, and that it caused persistent hepatitis in the majority of those infected," wrote Alter in *Hepatology* in 2013.

NOBEL PRIZE page 3

Hospital begins journey to earn Magnet accreditation

Led by the Nursing Department, the Clinical Center has started the journey to achieve accreditation from the American Nurses Credentialing Center as a Magnet® hospital. Magnet is the highest and most prestigious distinction that a health-care organization can earn for nursing excellence and innovation. Only 8% of U.S. hospitals and 3% of hospitals worldwide have earned a Magnet certification.

MAGNET page 4

Clinical Center CEO Awards celebrate innovations in 2020

A videocast celebration took place Dec. 18 during the fourth annual Clinical Center CEO awards to honor hospital staff and employees from across the NIH Institutes and Centers. More than 900 individuals were given a "virtual high-five" and heartfelt congratulations for their truly important work that has led to improvements in patient care, exceptional customer service, innovative approaches to crisis prevention and other notable achievements.

There were 74 group awards and 31 individual awards. The awards recognized accomplishments in Administration; Customer Service; Equity, Diversity and Inclusion; Innovation; Making an Impact: COVID-19; Patient Care; Patient Safety; Quality of Worklife/Diversity; Rising Star; Science and Teaching/Mentoring.

In 2020, COVID-19 is on the minds of all, especially those working in and receiving care at the NIH Clinical Center. The following are just a sampling of accomplishments honored in the Making an Impact: COVID-19 category:

- For orchestrating the refocus of lab operations to rapidly implement COVID-19 research in a safe and efficient manner.

CEO AWARDS page 2

- For leadership and planning in making COVID-19 Convalescent Plasma available for hospital patients.
- In recognition of the work to assist the Vaccine Research Center to conduct a first-in-human COVID-19 vaccine trial, in the face of a global pandemic.
- For pivoting research towards multi-national data and developing a CT scan artificial intelligence tool for detection of COVID-19, and differentiation from flu and other pneumonias.
- In recognition of extraordinary, rapid and sustained efforts to provide SARS-CoV-2 testing to NIH patients and employees by the Department of Laboratory Medicine Team.
- For outstanding collaboration and teamwork to stand up the Intensive Care Unit / Intermediate care unit to support critically ill COVID-19 patients.

View all of the 2020 Clinical Center CEO Awardees and the online ceremony: www.cc.nih.gov/ceoawards/index.html
- Molly Freimuth

Sex and gender in clinical research: breaking barriers, advancing equality in outcomes

Biological gender differences in men and women matter – but historically, women have not received the appropriate study and resulting treatment that underlies this belief. This was the opening message delivered by Dr. Alyson McGregor in the Ground Rounds: Great Teachers videocast Oct. 14 titled “Sex and Gender Based Research: Yesterday’s Neglect, Tomorrow’s Opportunity” (<https://videocast.nih.gov/watch=38786>). McGregor is Associate Professor of Emergency Medicine, at Brown University, serving as Director of Sex and Gender Emergency Medicine.

View more about the lecture online: <https://cc.nih.gov/about/news/newsletter/>
- Robert Burleson

Mysteries of sleep explored with combined MRI, EEG information

Understanding sleep is no snore to researchers at NIH’s National Institute of Neurologic Disorders and Stroke (NINDS) who are studying an intriguing question in sleep science – what changes can we observe in specific regions of the brain in different stages of sleep?

To investigate, a team of researchers is exploring the use of functional magnetic resonance imaging (fMRI) to study brain activity and its changes over time – a different process than the more familiar structural MRI, which simply produces a static image of regions of the brain. fMRI provides three-dimensional, progressive views of activity in the brain in the various stages of sleep.

One of the research team’s members, Dante Picchioni, Ph.D., scientist at NINDS said, “We were reviewing the literature, looking for gaps. We saw that very few studies had been conducted using fMRI that measured changes in brain connectivity across time.”

Earlier sleep studies relied on electroencephalography (EEG), which measures brain waves in sleep stages, including the familiar rapid-eye-movement stage, commonly known as REM sleep.

“We were looking for a parallel avenue of research that would complement what we had learned using EEG”, Picchioni added. “We wanted to see if new research could help further define what sleep actually is and what it does.”

The team first completed a pilot study to show that all-night fMRI studies were feasible, and from that, call attention to what kind of expanded study might be possible. According to Picchioni, one surprising finding was the contribution of the autonomic nervous system (a largely unconscious process that regulates bodily activity enclosing heart and respiratory rate, among



A healthy volunteer prepares to sleep overnight in the MRI scanner at the NIH Clinical Center.

many functions) and associated non-brain related causes of activity seen in fMRI.

Viewing sleep as a human behavior with four characteristics (no physical motion, a specific posture, immediate reversibility and increasing thresholds for awakening associated with sleep stages), the researchers wanted to correlate fMRI with these observable conditions. By studying new fMRI images, the team is assembling a more complete picture of what the brain activity that makes the progressive sleep stages occur truly looks like while it produces the divergent brain waves associated with different stages of sleep.

Could these fMRI and EEG-aided findings about brain activity in sleep lead to next-phase studies? From what is being learned about the hidden processes in all stages of sleep it might be possible in the future to explore and quantify how duration and progression of sleep stages in specific regions of the brain might affect physical activity, mental insight, acuity and memory while awake the next day.

Picchioni states, “This is an ongoing multi-year study – we’re trying to better understand the functions of sleep. Functional MRI, supported by EEG data is helping us in this effort.”

- Robert Burleson

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- Traumatic brain injury can now be diagnosed by a blood test
- 34 CC staff earn NIH Director's Awards
- Laboratory Medicine staff celebrate four decades of service

Clinical Center News

Editor: Molly Freimuth

Staff: Debbie Accame, Justin Baker, Lester Davis, Cindy Fisher, Mickey Hanlon, Donovan Kuehn, Maria Maslennikov, Daniel Silber

National Institutes of Health Clinical Center
10 Center Drive, Room 6-2551
Bethesda, MD 20892-1504

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Contact: 301-594-5789
Molly.Freimuth@nih.gov



While unable to definitely identify “non-A, non-B” hepatitis, the research by Alter and NIH colleagues led to many advances in blood screening and the reduction of transfusion associated hepatitis. By changing the sources and increasing the screening of blood products, the NIH Blood Bank was able to reduce the occurrence of the virus into patients who received transfusions.

These new approaches didn’t just remain at the Clinical Center. They were assessed in a multicenter, prospective study sponsored by the National Heart, Lung and Blood Institute which demonstrated the power of blood screening in preventing blood-borne infections. Based on this research, screening for hepatitis B was implemented nationally for U.S. blood banks in 1987, saving thousands from debilitating infections.

The “non-A, non-B” hepatitis was later identified as hepatitis C when an assay was developed by co-Nobel winner Michael Houghton.

Hepatitis C testing was introduced for blood donor screening in 1990 and had a dramatic effect. Research conducted by Alter’s team found that within three years of implementing the new procedures the incidence of hepatitis had dropped by 75%. After testing improvements, inci-

dents of transfusion associated hepatitis soon dropped to virtually zero.

“[T]he risk of HCV transmission is now estimated to be about one case in every two million transfusions,” said Alter. “This is about the same risk as being hit by lightning; personally, I would rather be transfused.”

Alter had focused on viral hepatitis even before his work on hepatitis C. In the 1960s, he co-discovered the Australia antigen, a key to detecting hepatitis B virus.

Alter has received many accolades aside from the Nobel prize. In 2013, he was honored with the distinguished Canada Gairdner International Award to recognize outstanding discoveries or contributions to medical science. In 2002, he became the first Clinical Center scientist elected to the National Academy of Sciences, and in that same year he was elected to the Institute of Medicine. And in 2000, Alter was awarded the prestigious Clinical Lasker Award which recognizes people who have made major advances in the understanding, diagnosis, treatment, cure or prevention of disease.

View Alters lecture, presented in the CC: <https://go.usa.gov/xACxa>

- Donovan Kuehn

After the whirlwind of calls, photos, and outreach of congratulations following the announcement of the Nobel, CC News checked in with Alter and asked if he could describe what it’s been like since that early October morning.

With his trademark humor and humility, he said, “winning the Nobel is indescribable and I am still sifting through its ramifications. Hard to know how to react. You must realize, I have never won one before. Since winning, life as I know it, is not as I know it. I think I used to be a reasonable man, but now I am unhinged. The elation that comes with the Nobel is short-lived, but the emails are forever. I now have typer’s cramp from responding. However, this has also been the best part as I have heard from almost everyone I ever knew, including many who are deceased.”

So, what’s next? What do you do after you win a Nobel, we asked.

Alter answered, “ironically, the same day I won the Nobel I was rehired to the Clinical Center. So after the Nobel I’ll be doing what I was doing before the Nobel. Unfortunately, I can’t remember what that was.”

Staff clinician, physician’s assistant, administrators of the year recognized for dedication, compassion

Dr. Stephanie Goff, with the National Cancer Institute, was named Staff Clinician of the Year, Theresa Jerussi, with the Clinical Center, was named Physician Assistant of the Year and Patricia Coffey and Bernard Harper, both also with the Clinical Center, were co-named for Administrators of the Year in the Clinical Center Recognition Program.

Dr. Francis Collins, the director of the NIH, announced the awardees during the Clinical Center Town Hall (NIH staff only) Oct. 6: <https://go.usa.gov/x7KZq>

“Nominations were made at the height of pandemic restrictions, yet despite how busy nominators were, they went to great lengths to nominate these individuals who were in turn

busy making their own invaluable contributions to the pandemic response,” said Collins during the town hall. “Congratulations to the four awardees. My thanks to you and your dedication and to all those whose hard work, compassion and excellence make the NIH Clinical Center what patients refer to it as the House of Hope.”

This is the third year for the awards. Usually the Clinical Recognition Committee selects only one Administrator of the Year but there was a tie this year. Read more: <https://cc.nih.gov/about/news/news-letter/2020/fall/story-05.html>

- Cindy Fisher



Awardees, Dr. Stephanie Goff and Theresa Jerussi (top row), Patricia Coffey and Bernard Harper (bottom row).

Magnet organizations receive more than a green seal of approval, they become the most optimal workplace for nurses and empower their nurses to be highly skilled, high-functioning innovators.

As a result, the tangible benefits that Magnet organizations experience include attracting and retaining top nursing talent; exponential improvements in patient care, safety and satisfaction; an enhanced culture of cross-disciplinary collaboration; advancements in nursing standards and practice; and achievement of nursing department and organizational goals. Leadership and staff at the Clinical Center are putting in the hard work necessary to join this elite group.

"While achieving Magnet status will directly benefit our nurses, the evidence is clear that Magnet hospitals also produce better outcomes for patients," Dr. James K. Gilman, CEO of the NIH Clinical Center, said at a Patient Advisory Group meeting in 2019. "Our efforts with the Nursing Department and across our interdisciplinary teams to achieve this accreditation are fully supported by me and by the Clinical Center Research Hospital Board as the next step in our evolution to high reliability and patient safety."

The Magnet accreditation process creates a framework for nursing excellence, research and measurement of outcomes. Through this framework, the American Nurses Credentialing Center evaluates applicants across a number of components including the quality of nursing leadership, coordination and collaboration across specialties and the quality and delivery of patient care. To achieve and maintain Magnet accreditation, the Nursing Department must create and implement action plans developed and powered by qualitative and quantitative data which demonstrate that they have created the vision, systems and environment to transform their department and the Clinical Center.

The Nursing Department must also show that nurses are trained and empowered to contribute new knowledge and improvements to patient care, the workforce, the Clinical Center and the nursing profession. This very rigorous certification process, which can take from 2 to 4 years to complete, includes on-site evaluations by the American Nurses Credentialing Center and a time of public comment for patients and staff to share their experiences and opinions of the nursing department and the Magnet journey.

"This process will give us a good hard look at the many things that we can do better for our nurses and for our patients. Our goal is to give the best patient care possible and create the best patient experience within the context of a very robust and professional nursing department," added Dr. Gwenyth R. Wallen, Chief Nursing Officer at the hospital. "We will need everyone's support across the institutes and the Clinical Center to achieve this."

Rachel Coumes, the nursing program director leading the Magnet accreditation effort, hosted two virtual events, a Magnet invitational in August and a Magnet kick-off in October for Clinical Center staff to learn about Magnet, share their enthusiasm for the journey and the benefits. Coumes has selected Magnet Ambassadors from the nursing department to enhance communication between nurses in their work areas and the Magnet core team. Microsoft Teams and the Clinical Center's intranet are used as platforms for Magnet information and resources. Coumes is planning a special interest virtual event in early 2021 to address questions and provide updates on the application process.

Coumes emphasized, "While I want to grow the momentum of pride and excitement for our Magnet journey, I want to make sure that we are completely transparent about our process behind the scenes to earn our acceptance into the program."

- Lester Davis

Magnet-recognized organizations exhibit:

Nurses

- Positive work environment
- High nursing satisfaction
- Effective nursing recruitment and retention
- Autonomy in practice
- Professional development opportunities
- Nurses at Magnet hospitals experienced higher levels of empowerment and job satisfaction compared to nurses at non-Magnet hospitals.



Patients

- Improved clinical outcomes
- High patient satisfaction scores
- Engaged, educated and expert nurses
- Lower mortality rates; failure-to-rescue; patient fall rates; nosocomial infections; hospital-acquired pressure ulcer rates; and central line-associated bloodstream infection rates



Quality & Safety

- Higher adoption of National Quality Forum safe practices
- Lower overall missed nursing care
- Higher support for evidence-based practice implementation
- Higher nurse-perceived quality of care
- Higher patient ratings of their hospital experience

