



NEWSLETTER

Connecticut Society of Perfusion

August 2016

A One Hundred Year Old Accidental Discovery

Heparin is a drug that we have come to know and rely on in the medical community. We don't even think twice about using it. Most of us probably couldn't imagine how we would treat our patients without it. Sure, there's lepirudin, argatroban and bivalirudin, but let's face it, the thought of using any of them makes us cringe. Who would have thought that this "wonder drug" was discovered purely by accident? It is hard to believe, but it's true. This year (2016) marks the hundredth anniversary since the event that was initially considered as a curious physiological phenomenon, and subsequently became the basis for the evolution of vascular and cardiac surgery, haemodialysis, blood conservation, and prevention and treatment of thrombo-embolic disease; the accidental discovered of heparin.

Jay McLean was born in 1890 in San Francisco, California. It was said that he had a difficult and unfortunate childhood. "I was reared without a father. My stepfather was unsympathetic to my plans for a medical education at Johns Hopkins. The earthquake and fire in San Francisco in 1906 stripped us of all accumulated assets; our house burned, my stepfather's place of employment burned, and outlook was stark. Despite these handicaps, I made the decision to become a physician during my last year at Lowell High School in San Francisco".¹

In 1915 Jay McLean entered medical school at Johns Hopkins University. It was there that he met with the chairman of the Department of Physiology, Dr. William H. Howell. Dr. Howell had a long standing history and experience in blood coagulation research (found a way to isolate thrombin). "I told him of my desire to prepare for an academic career in surgery and that I wished to devote one whole year to physiological research now. I felt that I could never do it after graduation. I told him then that I wanted a problem I could reasonably hope to finish and publish in one academic year entirely by myself. I wanted to determine if I could solve a problem by myself."¹ Dr. Howell gave him the task of determining the value of the thromboplastic substance of the body (which he believed to be Kephalin).¹

Kephalin (otherwise known as cephalin), found in the brain, is a powerful thromboplastic agent. Brain tissue was macerated, spread onto glass panes, dried over a gas flame, and then it was extracted in ether through decanting, concentrating the ether extract and finally by precipitation with alcohol. The result was a thromboplastic substance that Dr. Howell used in his blood clotting experiments. McLean's task was to determine which portion of this crude extract was the active accelerator of the clotting process and to prepare cephalin as *pure* as possible and determine if it alone had thromboplastic action.¹

McLean noted that cephalin could not be crystallized, therefore, one could not be sure of its purity and hence, its function as the thromboplastic substance of the body. It was thought that if the thromboplastic activity of brain extract were due to some other substance, adherent to or absorbed by cephalin, this might not be so in organs which did not contain such a large amount of cephalin as the brain does. It was then determined that it might be profitable to extract the phosphatides from many different organs. In his research, McLean found articles written by Erlandsen and Baskoff in which they described extracts of the heart and liver (cuorin and heparphosphatide) which were secured in a similar manner to that of cephalin from the brain.¹

He needed to prove that an ether-soluble, alcohol-insoluble extract of cephalin would accelerate coagulation of blood and he did. Then, struck by curiosity, McLean became interested in the deterioration of cephalin (an unsaturated fatty acid). He had saved batches of cuorin and heparphosphatide. The more each substance was "purified" (ether extract into hot alcohol) the weaker their thromboplastic power became. He took the purified cuorin and heparphosphatide and tested it in serum plasma. The cephalin from the heart and liver deteriorated and lost its thromboplastic power. Various levels of purified batches were tested to the point of no thromboplastic activity. He then was able to prepare batches that not only lost their thromboplastic action, but actually halted the coagulation of the serum-plasma mixture. It was then determined that the extract from the liver possessed the strongest anticoagulation action after its contained cephalin had lost its thromboplastic action.¹

Once he knew for certain what he had found, he brought his discovery to Dr. Howell, who was nothing short of skeptical. McLean prepared a small beaker, with the blood of a cat, and then stirred in a batch of heparphosphatides, and placed it on Dr. Howell's desk. He asked Dr. Howell to let him know when it clotted. It never did.¹

Unfortunately, Jay McLean never received the credit he deserved for this amazing discovery in 1916. He actually never even realized what he had stumbled upon. It wasn't until 1940 that Dr. McLean uncovered that he had been a major player in a great historical event. Heparin was divulged and studied by Dr. Howell in 1918 and it was licensed for production by C.H. Best, a Canadian physiologist, in 1931. In 1936 it was clinically used for the first time in Canada and Sweden.²

Upcoming Local Meetings:

- August 23, 2016

Hartford Hospital Journal Club Meeting

Sponsored by Grifols, Inc.

Dr. Manny Lopes Fontes—

Chief of Anesthesia, YNNH

Hereditary Antithrombin Deficiency

and the use of Thrombate/

Role of Thrombate During Cardiac

Surgery and ECMO

Fleming's Steakhouse-

West Hartford, CT 6:30 PM

Registration is Required—Space is Limited

Contact: Michael.Arciszewski@hhchealth.org

- September 22, 2016

Hartford Hospital's Annual Interdisciplinary Transplant Symposium

7:45AM-4PM

Sheraton Hartford South Hotel

100 Capitol Blvd

Rocky Hill, CT

Registration is Required—\$100.00

cpcservicesweb.coniferhealth.com

- October 5, 2016

Hartford Hospital's 32nd Annual Cardiovascular Symposium

Connecticut Convention Center

Hartford, CT 7:30 AM—3:30 PM

Registration is Required—\$75.00

[www.hartfordhospital.org classes & events](http://www.hartfordhospital.org/classes&events)

- November 4, 2016

Hartford Hospital/ ERC and Simulation Lab

2nd Annual Patient Blood

Management Symposium

Hartford Hospital—ERC

[www.hartfordhospital.org classes & events](http://www.hartfordhospital.org/classes&events)

- April 29– May 2, 2017

AmSECT 55th International Conference

Hynes Convention Center

Boston, MA

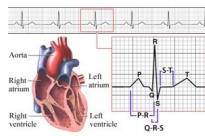
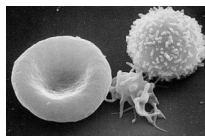
- Fall 2017

3rd Annual New England Perfusion Symposium

Location TBD

Fun Facts

- ◆ 2600 BC The Egyptian Imhotep describes the diagnosis and treatment of 200 diseases
- ◆ 500 BC Alcmaeon of Croton distinguished veins from arteries
- ◆ 460 BC Scientific study of medicine and prescription of a form of aspirin
- ◆ 1628 William Harvey publishes *An Anatomical Study of the Motion of the Heart and of the Blood in Animals* which forms the basis for future research on blood vessels, arteries and the heart
- ◆ 1656 Sir Christopher Wren experiments with canine blood transfusions
- ◆ 1670 Anton van Leeuwenhoek discovers blood cells
- ◆ 1740 The Paris Academy of Sciences officially recommended mouth-to-mouth resuscitation for drowning victims
- ◆ 1818 James Blundell performs the first successful human blood transfusion
- ◆ 1891 Dr. Friedrich Maass performed the first equivocally documented chest compression in humans
- ◆ 1899 Felix Hoffman develops aspirin
- ◆ 1901 Karl Landsteiner introduces the system to classify blood into A, B, AB and O groups
- ◆ 1903 Dr. George Crile reported the first successful use of external chest compressions in human resuscitation
- ◆ 1913 Dr. Paul Dudley White Pioneers the use of the ECG
- ◆ 1937 Bernard Fantus pioneers the use of the first blood bank in Chicago, IL
- ◆ 1950 John Hopps invented the first cardiac pace maker
- ◆ 1952 Paul Zoll develops the first cardiac pacemaker
- ◆ 1960 CPR was developed by the American Heart Association
- ◆ 1963 Thomas Fogarty invented the balloon embolic tomy catheter
- ◆ 1967 Dr. Christian Barnard performs the first human heart transplant
- ◆ 1979 ACLS is developed
- ◆ 1983 CPR and ECC guidelines for pediatric and neonatal patients



EMPLOYMENT

OPPORTUNITIES

Connecticut Children's Medical Center:

Per Diem Positions:

Request for per diem support of our Pediatric ECMO program at CCMC.

Please contact:

David J Rosinski MS CCP

Director of Cardiovascular Perfusion
UConn Health & Connecticut Childrens
Medical Center, The Heart Center of
Greater Waterbury
Office 860-679-1059 ; Cell 860-299-6835

Hartford Hospital:

Per Diem Positions:

Hartford Hospital is seeking highly motivated candidates to join a Perfusion team of 10 full time perfusionists and other per diem perfusionists to cover a growing ECMO/ Cardiovascular program. Must be able to operate devices required for the cardiopulmonary and circulatory support of patients in the Operating Room and Intensive Care Unit. Reports to the Chief Perfusionist.

Full Time Position:

Hartford Hospital is seeking a full time perfusionist to join our growing team. Required to operate devices required for the cardiopulmonary and circulatory support of patients in the Operating Room and Intensive Care Unit for the appropriate indicated patient outcome. Reports to the Chief Perfusionist.

Please contact:

Allison M. Conelius, CCP, LP

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Hartford HealthCare
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We Want to Hear From **YOU!**

We value your knowledge, thoughts, ideas and suggestions. If you would like to submit an article, research information, news about an upcoming meeting, or any other valuable information pertinent to the perfusion community, please contact the CSP at :

WWW.CTPERF.COM

and click on the tab labeled CONTACT US. Your entry will be featured in our next monthly newsletter.

The CSP Newsletter will be emailed on a monthly basis to those on the CSP mailing list, and it will also be featured on our website.



ABCP CERTIFICATION/EXAMS

Fall Exam Dates: October 19-22, 2016