

Citation for Chemical Breakthrough Award Program Update (Including 2017 Award Year)

Jeffrey I. Seeman
Award Committee Secretary

August 10, 2018

Summary

- Twelve years of awards (2006 –2017) have been completed not including six awards for the 2018 award year
- 61 CCB Awards have been presented to date at 75 sites (due to multiple collaborations and locations) (not including the 2018 award year).
- Status for the 2018 award year: The awards committee has selected the six awardees, these awardees have been notified, drafts of the six plaques have been prepared and provided to the manufacturer for production, and award ceremonies are being planned for all six awards. Five presenters have agreed to participate and a sixth will shortly be invited.
- CCB Awards are plaques only, given to institution from which the research was published
- We provide assistance with and sometimes participation in award ceremonies
- Two award ceremonies were held in the last 12 months
 - National Institute for Medical Research, Mill Hill which became the Francis Crick Institute in 2016 (by Peter Morris)
 - Harvard University (Evan Helper-Smith)
- Photographs and associated text dealing with the award ceremonies are found on the CCB Award's web pages
http://www.scs.illinois.edu/~mainzv/HIST/awards/citations_chem-breakthroughs.php
- The CCB Award program now has many and an increasing number of links on Wikipedia
- The CCB Award program also has a link and a large description of the program on the ACS National Historic Chemical Landmarks Program

The 2017 awards are listed in the graph below, taken from the CCB Award web site that is housed on the HIST website that is designed and maintained by Vera Mainz.

From the HIST website:

http://www.scs.illinois.edu/~mainzv/HIST/awards/citations_chem-breakthroughs.php

Scientists/Inventors	Breakthrough Publication (If text is in color, this is a live link to the plaque.)	Location of Award (If text is in color, this is a live link to photographs and other materials related to the presentation.)
Linus Pauling, Robert B. Corey, and H.R. Branson	"The Structure of Proteins: Two Hydrogen-Bonded Helical Configurations of the Polypeptide Chain," <i>Proceedings of the National Academy of Sciences (USA)</i> 1951, 37, 205-2011	California Institute of Technology
A. T. James and A. J. P. Martin	"Gas-Liquid Chromatography: A Technique for the Analysis and Identification of Volatile Materials," <i>Brit. Med. Bulletin</i> 1954, 10 (3), 170-176	National Institute for Medical Research, Mill Hill which became the Francis Crick Institute in 2016
A. Maxam and W. Gilbert	"A new method for sequencing DNA," <i>Proceedings of the National Academy of Sciences (USA)</i> 1977, 74, 560-564	Harvard University
R. K. Saiki, K. B. Mullis, H. A. Erlich	"Enzymatic Amplification of β-globin Genomic Sequences and Restriction Site Analysis for Diagnosis of Sickle Cell Anemia," <i>Science</i> 1985, 230, 1350-1354	Cetus Corporation sold to Chiron Corporation in 1991. Chiron was acquired by Novartis International in 2006.

The 2017 award plaques are shown at the very end of this report. All plaques are also found on the HIST website under HIST Awards, Citation for Chemical Breakthrough Award.

The blue link in the second column leads the web visitor to that award's plaque. You will note that there is no blue link in the last row, the award for the Mullis et al. achievement. Repeated contacts with Novartis International failed to lead to any desire to receive the award plaque.

The members of the 2016 Award Committee are listed below and also on the HIST website (with the Award Committee members from the first award year).

**Award Committee Members
2017 and 2018**

Anthony G. M. Barrett, F.R.S. (Imperial College of Science, Technology and Medicine)

Michael Bowers (University of California, Santa Barbara)

Carmen Giunta (Le Moyne College)

Harry Gray (Caltech)

Dudley Herschbach (Harvard)

Peter Morris (Science Museum London)

Amos Smith (Penn)

Jeffrey I. Seeman, Committee Secretary (Non-voting) (University of Richmond)

- The program has received excellent responses in the USA and Europe. To date, no awards have been presented to Asia or South America.
- Nominations are open to all.
- Announcements of the call for nominations and of the awardees appear regularly in C&EN and are sent to all HIST members by email.
- The plaque-design process is much more difficult than anticipated. It is often hard to obtain the required high quality scans of original publications from the 19th Century. There have been design issues with the recipient organizations.
- We have received extraordinary cooperation from the plaque manufacturer, Stellar Kent (<http://www.stellarkent.com/index.php>). In fact, in 2014, HIST Certificate of Appreciation Awards were given to Carol Hall, Linda Mason, and the Stellar Kent Corporation for their work on the CCB award program.
- As of 2014, the Linda Hall Library of Science, Engineering and Technology (Kansas City, MO) has donated several high quality images of journal articles, if available, at no charge for the award program

Finances and Donations

- The plaques cost ca. \$350 each including shipping to the USA. Shipping to Europe is another \$75 - \$100 and sometimes considerably more than \$100 depending on location.
- Initial funding
 - \$10K from ACS DAC Innovative Grant
 - \$10K from ACS Corporate Associates
 - \$6K from ACS DAC Innovative Grant for Local Section travel
 - Funds from individual donors (donations continues to this day)
- HIST currently provides 50% matching to one annual donation (individual donor, \$1200/year; HIST, \$600/year).
- Annual costs ca. \$1700 - \$2200/year.
- Annual income ca. \$1800/year.
- As of August 9, 2018, there is \$2049.61 was available for the plaque program (excluding travel, see bullet statement immediately below). As of August 9, 2018, there is \$3075.46 available for the plaque program (excluding travel, see bullet statement immediately below).
- Based on the latest update available for HIST Treasurer Vera Mainz, there is \$4173.16 available for travel support for local section and related representation (ACS Innovative Grant Program).

Website

The HIST website contains high quality images of all the plaques and much supplementary information, including photographs of many awards ceremonies, ceremony agenda, and related materials.

http://www.scs.illinois.edu/~mainzv/HIST/awards/citations_chem-breakthroughs.php

The CCB award program's website is exceptional and expanding, thanks to the continuing excellent work of Vera Mainz. The website is organized by award year. Originally, there was only a table of all award winners for each year (from 2006 when the first awards were presented). From that page, one could and can see the award plaques for each winner as well as the supplementary material associated with that award. In 2014, several new pages were added that provide the visitor with rapid access to the awardees, organized by name OR location OR date of the awardee's publication.

We are fortunate that most of the recipients have provided photographs and other information about their presentation ceremonies, etc. for use on our website.

CCB Award on Wikipedia

In early August 2016, Ron Brashier introduced us to Mary Mark Ockerbloom, Wikipedian in Residence at the Chemical Heritage Foundation. She has volunteered, as part of her outreach role at CHF, to place information about the CCB awards on Wikipedia. She has now placed text on Wikipedia to the CCB award and links on Wikipedia to HIST's website for all the awards presented in 2015 through 2017. For many of these awards, text and links are found in multiple locations due to multiple authors who already have Wikipedia sites. We plan on completing links and text for all CCB awards by 2020.

CCB Award on the ACS Historic National Historic Chemical Landmarks Program Website

On the "About the ACS Historic National Historic Chemical Landmarks Program" web page, <https://www.acs.org/content/acs/en/education/whatischemistry/landmarks/about.html> the following text and link appears:

Citation for Chemical Breakthrough Awards

Since 2006, the Citation for Chemical Breakthrough Award program, administered by the ACS Division of the History of Chemistry, has honored scientific publications, books and patents that have been revolutionary in concept, broad in scope, and which forever changed the face of chemistry.

In 2017, four awards were made:

- To California Institute of Technology, for the Pauling, Corey and Branson 1951 publication on "The Structure of Proteins"
- To the Francis Crick Institute for the James and Martin 1954 publication on "Gas-Liquid Chromatography"
- To Harvard University for the Maxam and Gilbert 1977 publication on "A New Method for Sequencing DNA"
- To Novartis International for the Saiki, Scharf, Faloona, Mullis, Horn, Erlich and Arnheim publication on "Enzymatic Amplification of Beta-Globin Genomic Sequences" (Polymerase Chain Reaction/PCR)"

More information is available on the HIST Citation Awards webpage.

The three 2017 award plaques are shown on the next pages.

The fourth award, to Novartis for the Mullis, et al. paper (Cetus Corporation) was not accepted and thus was not produced.



Division of the History of Chemistry
American Chemical Society



Citation for Chemical Breakthrough

Proceedings of the National Academy of Sciences 1951 37, 205-211.

THE STRUCTURE OF PROTEINS: TWO HYDROGEN-BONDED HELICAL CONFIGURATIONS OF THE POLYPEPTIDE CHAIN

BY LINUS PAULING, ROBERT B. COREY, AND H. R. BRANSON

GATES AND CRELLIN LABORATORIES OF CHEMISTRY,
CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA, CALIFORNIA



FIGURE 2
The helix with 3.7 residues per turn.



FIGURE 3
The helix with 5.1 residues per turn.

Presented to the California Institute of Technology, 2017



Division of the History of Chemistry
American Chemical Society

Citation for Chemical Breakthrough



British Medical Journal 1954 10, 170-176.

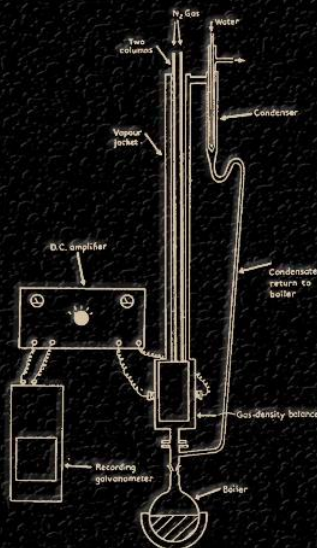
GAS-LIQUID CHROMATOGRAPHY A Technique for the Analysis and Identification of Volatile Materials

A. T. JAMES Ph.D.

A. J. P. MARTIN Ph.D. F.R.S.

*National Institute for Medical Research
Mill Hill, London*

FIG. 8. SCHEMATIC LAY-OUT OF GAS-LIQUID PARTITION CHROMATOGRAPHY APPARATUS, USING A GAS-DENSITY BALANCE FOR DETECTION AND ESTIMATION OF THE ZONES



Presented to The Francis Crick Institute, 2017.



Division of the History of Chemistry
American Chemical Society

Citation for Chemical Breakthrough

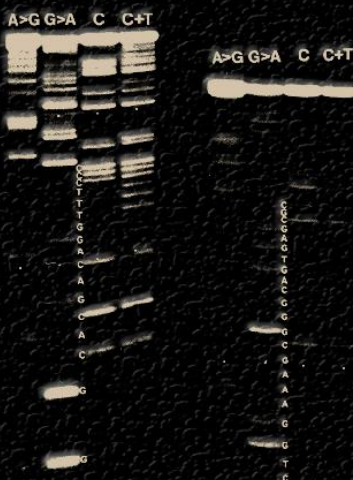


Proceedings of the National Academy of Sciences, USA, 74, 560-564, 1977.

A new method for sequencing DNA

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ABSTRACT DNA can be sequenced by a chemical procedure that breaks a terminally labeled DNA molecule partially at each repetition of a base. The lengths of the labeled fragments then identify the positions of that base. We describe reactions that cleave DNA preferentially at guanines, at adenines, at cytosines and thymines equally, and at cytosines alone. When the products of these four reactions are resolved by size, by electrophoresis on a polyacrylamide gel, the DNA sequence can be read from the pattern of radioactive bands. The technique will permit sequencing of at least 100 bases from the point of labeling.

Presented to the Department of Molecular and Cellular Biology, Harvard University, 2017