

The International Cotton Genome Initiative (ICGI): Its Origin, Mission, and Development

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Origin and Purpose

In February 2000, a small group of cotton scientists and industry representatives from Australia, France, and U.S. met in Canberra, Australia, for a Symposium on Molecular Markers in Cotton. The question presented to the group was “How can we use molecular markers to greater effect in cotton breeding?” The meeting had two components. The first day featured a series of talks detailing progress in molecular marker development in cotton. These presentations provided a framework for the discussions the following day. The clear consensus of those discussions was the need for improved communication and collaboration among researchers. The lack of a formal mechanism for collaborating and exchanging information was identified as a key limitation to molecular marker development in cotton, and the workshop participants all agreed that the long-term solution was to instigate an international organization that would facilitate communication and collaboration among cotton researchers. In seeking to achieve this goal, four key considerations were identified:

1. A consensus map should be constructed by the analytical amalgamation of current maps using framework PCR-based DNA markers.
2. A physical map should be constructed using a single large-insert library.
3. The bioinformatic tools for securely storing, analyzing, and disseminating data must be developed.
4. This must be a collaborative effort, open to all interested parties internationally.

Although the workshop participants recognized that they could not represent the whole international cotton genomics community, it was also recognized that such an effort must start with a nucleus of people willing to devote their time to broadcasting the idea, developing a structure, recruiting broader participation, and organizing ever more inclusive meetings. To this end, the workshop participants commissioned five researchers as a Steering Committee, representing Australia, France, and USA, charged with guiding the idea of an International Cotton Genome Initiative (ICGI) to a formal reality with the support and cooperation of the other workshop participants. The Steering Committee comprised of Curt Brubaker (Australia), Roy Cantrell (USA), Marc Giband (France), Bruce Lyon (Australia), and Thea Wilkins (USA), and they were charged with:

- Coordinating communication among the participating scientists, distributing information, and developing an electronic forum for discussion;

- Developing a set of by-laws for consideration at the next international meeting; and
- Organizing a second international meeting.

The first action of the ICGI Steering Committee was an open letter to the cotton genomics community published in the *JOURNAL OF COTTON SCIENCE* 4: 149-151 (2000): (<http://www.jcotsci.org//2000/issue02/toc.html>).

The ICGI became a formal reality a year later at the ICGI 2001 workshop hosted by CIRAD in Montpellier (France), when thirty-one researchers from six countries (representing public and private cotton research) developed a mission statement and a preliminary structure for the ICGI.

The meeting consisted of a review of public research activities; a review of some models for international collaboration; and an effort to establish an operational structure for ICGI.

A critical outcome was the organization of an expanded Steering Committee charged with maintaining the current momentum and with guiding this emerging organization forward. First developed was a mission statement for ICGI.

Mission Statement

To increase knowledge of the structure and function of the cotton genome for the benefit of the global community, and to facilitate:

- Global communication, collaboration, and education
- Knowledge and resource integration
- Technology and resource development
- Coordinated research planning

The mission statement was followed with the establishment of a tentative structure through which the mission could be implemented.

ICGI Structure

Steering Committee Membership:

Until a formal structure for the ICGI is approved by the entire membership, the existing Steering Committee (Roy Cantrell, Curt Brubaker, Bruce Lyon, Thea Wilkins, and Marc Giband) was asked to continue. However to spread the workload, Russ Kohel, Andy Paterson, Jean-Marc Lacape, Lloyd May, Damian Gessler, Liz Dennis, Sukumar Saha, Bill Hugie, and Siva Kumpatla were asked to join the steering committee. This interim Steering Committee would serve until a formal election by the ICGI membership could take place. While the ex-

panded Steering Committee was clearly more inclusive than the original, all the supporters of the ICGI were aware that the entire cotton genomics community had yet to be involved in this initiative. But for precisely this reason, the need still existed for a small nucleus of individuals to drive the idea of an International Cotton Genome Initiative forward. The only way a small group of individuals can promote the idea of an International Cotton Genome Initiative open to all interested parties is to do so as openly as possible.

Because of the increased size of the Steering Committee membership, it was agreed that a chairperson was necessary. Bruce Lyon oversaw the election by the other members of the committee. Three individuals were nominated, namely Marc Giband, Curt Brubaker, and Roy Cantrell. Marc Giband subsequently declined the nomination. Roy Cantrell received nine primary votes and Curt Brubaker received four. Ten members agreed with the suggestion that the runner-up be offered the position of co-chair. Roy Cantrell was duly pronounced chair and Curt Brubaker co-chair of the interim Steering Committee on July 10, 2001.

Although no clear consensus was reached during the meeting, the following proposed ICGI structural model represented a starting point for the next business meeting. The ICGI will be comprised of five functional workgroups that will represent the primary functional units of the organization:

- Structural Genomics
- Functional Genomics
- Germplasm and Genetic Stocks
- Bioinformatics
- Evolutionary and Comparative Genomics

The workgroups were charged with:

- Executing the ICGI guiding principles of the mission statement
- Defining specific research and collaborative goals
- Identifying common shared resources
- Reporting activities to the ICGI as a whole
- Organizing symposia
- Formulating long-term research collaborations

Participants of the Montpellier workshop determined that: the workgroups will be overseen by the Steering Committee and guided by an Advisory Committee; a Steering Committee will be formed that will be comprised of representatives elected by the workgroups and representation will be proportional to workgroup size; the Steering Committee will elect a Chair internally; and in addition, a Membership Coordinator, a Website Coordinator, and an Administrative Manager will assist the Steering Committee. The Advisory Committee structure was to be determined by the ICGI membership.

Initiated an active program of reaching out to the international community:

- PAG, WCRC, posters at the WCRC, Beltwide Meetings, PAG, and personal contacts
- Even developed a logo
- Identified and targeted unrepresented key cotton growing countries
- Identified the need to have an Advisory Committee made up of the private industry

Made the activities open and available to the international community on the web by:

- Coordinating communication among the participating scientists, distributing information, and developing an electronic forum for discussion
- Developing a set of by-laws for consideration at the next international meeting; and
- Organizing a subsequent international meeting.

Proposed goals of ICGI were to:

- Reduce redundancy of research efforts and maximized rate of progress in research to understand the cotton genome.
- Foster tool development to begin integrating genetic and physical maps.
- Accelerate development of a portable cotton linkage map.
- Foster rapid application of new genomic tools to cotton improvement.
- Develop a comprehensive forum for exchange and communication within the cotton scientific community and with the Arabidopsis model genome community.
- Develop standardized nomenclature for DNA markers, maps and etc.

This workshop could not have been held without financial support from the industry. To fund this meeting, Roy Cantrell approached cotton breeding, genetics, and biotechnology stakeholders for modest support. Because we hoped to invite key researchers, we needed funds to pay for their travel. The following organizations generously provide financial support: Aventis, Monsanto, Stoneville Pedigreed Seed, Cotton Foundation (USA), Delta & Pineland Co., Syngenta, Cotton Incorporated (USA), and Dow AgroSciences.

The history, mission, and structure of the ICGI are summarized in the ICGI 2001 Workshop report, "Developing the International Cotton Genome Initiative" available at (<http://icgi.tamu.edu>).

ICGI Research Conference 2002

The mission of the ICGI was realized at the ICGI Research

Conference 2002 hosted by Nanjing Agricultural University in Nanjing, China. Over 90 researchers from 14 countries contributed 105 oral and poster presentations in what was the first of biennial ICGI research conferences. Abstracts of these are found at (<http://icgi.tamu.edu/nanjing/done.html>).

Annual ICGI Workshops at Plant and Animal Genome Conferences

To foster interactions between the cotton community with the other plant genome communities, the ICGI community realized a need of its annual workshop at the Plant and Animal Genome Conference in San Diego, California. With an approval from both the ICGI Steering Committee and the PAG organizers, the ICGI workshop has become the only workshop to represent the global cotton community in PAG Conferences.

ICGI Research Conference 2004

The second ICGI Research Conference 2004 hosted by the Indian Society for Cotton Improvement and the Government of Indian in Hyderabad, India. Over 100 researchers from 14 countries contributed 109 oral and poster presentations. Abstracts of these are found at (<http://icgi.tamu.edu/meeting/2004/>).

Establish Constitution and By-Laws and Elected Officers

Following the 2004 meeting, ICGI established a committee to develop a Constitution and By-Laws. These were ratified by the membership.

2005 - 2007 ICGI Officers/Steering Committee:

Following ratification of the Constitution and By-Laws, an election was held for those positions defined in the C&BLs.

ICGI

Chairperson
Russell Kohel

Co-Chair
John Yu

Workgroups

	Chairperson	Co-Chair
Bioinformatics	Jun Zhu	Brian Scheffler
Evolutionary & Comparative Genomics	Andy Paterson	David Stelly
Functional Genomics	Norma Trolinder	Xiao-Ya Chen
Germplasm & Genetic Stocks	Richard Percy	Sukumar Saha
Structural Genomics	Tianzhen Zhang	Jean-Marc Lacape

Subsequently, ICGI advisory committee and coordinators were appointed.

Advisory Committee

Roy Cantrell
David Fang
Siva Kumpatla
Vidya Sagar
Jinhua Xiao

Membership and Website Coordinator

Russell Kohel

Treasurer and Secretary

Peng Chee

ICGI Research Conference 2006

The ICGI Research Conference 2006 was held in Brasilia, DF, Brazil, Sept. 18 - 20, 2006.

ICGI supports the cooperation and coordination of genomic research in the international cotton community through:

Biennial Research Conferences

Annual Workshop at PAG Conferences

Does not provide funds for research

Does solicit donations of funds to support the conduct of Research Conferences

ICGI is a young organization. It has been very successful in establishing an international dialogue among cotton researchers. The primary venue for this exchange of information and dialogue has been the Research Conferences and the PAG Workshops. ICGI interacts with its membership through its website (<http://icgi.tamu.edu>) and email contacts. As a formative organization, ICGI is still seeking opportunities to serve the international cotton research community and to foster and strengthen interactions among the various countries and institutions that make up this community.