



# Insights into the evolution of B and Rfp-Y - Two genetically independent Mhc gene clusters in the chicken

Marielle Afanassieff, Rima Zoorob, Marcia M. Miller, Françoise Coudert,  
Charles Auffray

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Marielle Afanassieff, Rima Zoorob, Marcia M. Miller, Françoise Coudert, Charles Auffray. Insights into the evolution of B and Rfp-Y - Two genetically independent Mhc gene clusters in the chicken. 35th Midwinter conference of immunologists, Jan 1996, Pacific Grove, United States. 1996. hal-02839759

**HAL Id: hal-02839759**

**<https://hal.inrae.fr/hal-02839759>**

Submitted on 7 Jun 2020

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# THE THIRTY-FIFTH MIDWINTER CONFERENCE OF IMMUNOLOGISTS

January 27-30, 1996  
Asilomar Conference Center  
Pacific Grove, California

Christel Uittenbogaart, Executive Director

Roberta Meyers-Elliott, Treasurer

## REGULATION OF ANTIGEN-SPECIFIC IMMUNITY

Chairpersons: Mitchell Kronenberg and Susan Swain

The Dan H. Campbell Memorial Lecture  
Saturday, January 27th, 8:00 PM

**John Kappler**

National Jewish Center  
Immunology and Respiratory Medicine  
Denver, Colorado

"T-Cell Receptor Ligand Interactions"

### Council Members

Edward Clark  
William Clark  
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# CONFERENCE SCHEDULE

## *Saturday, January 27th*

8:00 PM

The Dan H. Campbell Memorial Lecture (Merrill Hall)

9:00 PM

Reception - (Nautilus and Triton Rooms)

## *Sunday, January 28th*

8:30-12:00 Noon

SESSION I - Antigen/antigen receptor interactions

4:00- 6:00 PM

Poster Session and informal discussion groups (Firelight and Kiln Rooms)

7:30-10:00 PM

SESSION II - Antigen presentation

Reception - (Firelight and Kiln Rooms)

## *Monday, January 29th*

8:30-12:00 Noon

SESSION III - Development of memory cells

4:00- 6:00 PM

Poster Session and informal discussion groups (Firelight and Kiln Rooms)

7:30-10:00 PM

SESSION IV - Lymphocyte trafficking and homing

Reception - (Firelight and Kiln Rooms)

## *Tuesday, January 30th*

8:30-12:00 Noon

SESSION V - How pathogens modify the immune response

# CONFERENCE PROGRAM

## **SESSION I**

*Sunday Morning*

8:30-12:00 Noon

*Speakers:*

### ***ANTIGEN/ANTIGEN RECEPTOR INTERACTIONS***

*Chairperson: MARK DAVIS*

**Lewis Lanier**

DNAX Research Institute, Palo Alto, California

"Recognition of MHC class I by human NK and T cells"

**Wayne Yokoyama**

Washington University, St. Louis, Missouri

"The specificity of murine natural killer cells"

**Mark Davis**

Stanford University, Palo Alto, California

"T cell receptor biochemistry, repertoire selection and structure"

**Stephen Jameson**

University of Minnesota, Minneapolis, Minnesota

"T cell receptor interactions with antagonist ligands"

# MIDWINTER CONFERENCE OF IMMUNOLOGISTS

## POSTER ABSTRACT

(Briefly summarize theme below)

NAME: AFANASSIEFF Marielle TELEPHONE: (818) 301 8264  
ADDRESS: Beckman Research Institute of City of Hope; Duarte; CA 91010

### Insights into the evolution of *B* and *Rfp-Y* - Two genetically independent *Mhc* gene clusters in the chicken.

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<sup>1</sup>Beckman Research Institute, City of Hope, Duarte, CA 91010, USA; <sup>2</sup>CNRS UPR 420, BP 8, 94801 Villejuif Cedex, France; <sup>3</sup>INRA-Tours, Station de PAP, 37380 Nouzilly, France.

The chicken major histocompatibility complex (*Mhc*) genes are organized in two genetically independent systems, designated *B* and *Rfp-Y* (1), corresponding to cosmid clusters I and II/III/IV, respectively, on the molecular map of chicken *Mhc* (2, 3, Miller *et al.* submitted). *B* and *Rfp-Y* each contain both class I $\alpha$  and class II $\beta$  genes. This organization of *Mhc* genes into two systems might be of functional significance in chickens and perhaps represents an evolutionary important alternative way of organizing *Mhc* genes. To gain insight into the relationship between the *Rfp-Y* and *B* systems, we have sequenced and analysed the two class I $\alpha$  genes of *Rfp-Y* and the remaining class I $\alpha$  gene of *B*. Previously, only one of the two class I genes in the *B* system was sequenced (4). The class I genes of *B* and *Rfp-Y* are structurally dissimilar. While the two genes present within each system are highly similar to each other (about 94% homology in the coding sequence and 90% homology in the predicted protein sequence), comparisons across the systems show that the genes in each system are structurally distinct (about 76% homology in the coding sequence and 62% homology in the predicted protein sequence across the two systems). Hence, the class I $\alpha$  genes in *B* and *Rfp-Y* can be classified as members of two different gene families. The class II $\beta$  genes in *B* and *Rfp-Y* were shown earlier to also be members of two different gene families (5). These data indicate that *B* and *Rfp-Y* may have arisen by duplication and translocation of an entire gene region, followed by an additional duplication of individual class I and class II genes. We are currently analysing the expression of *B* and *Rfp-Y* class I $\alpha$  genes in several tissues of adult chickens by RT-PCR to determine if the organizational and structural separation of the two system is associated with a functional specialization as well. The first results show that the two class I genes of *B* system and at least one of the two class I gene of the *Rfp-Y* system are expressed.

(1) Briles *et al.* (1993) *Immunogenetics* 37: 408-414.

(2) Guillemot *et al.* (1988) *EMBO J.* 7:2775-2785.

(3) Miller *et al.* (1994) *PNAS* 91:4397-4401.

(4) Kroemer *et al.* (1990) *Immunogenetics* 31:405-409.

(5) Zoorob *et al.* (1993) *Eur. J. Immunol.* 23:1139-1145.

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(Recommended poster size, 3'x4' maximum)