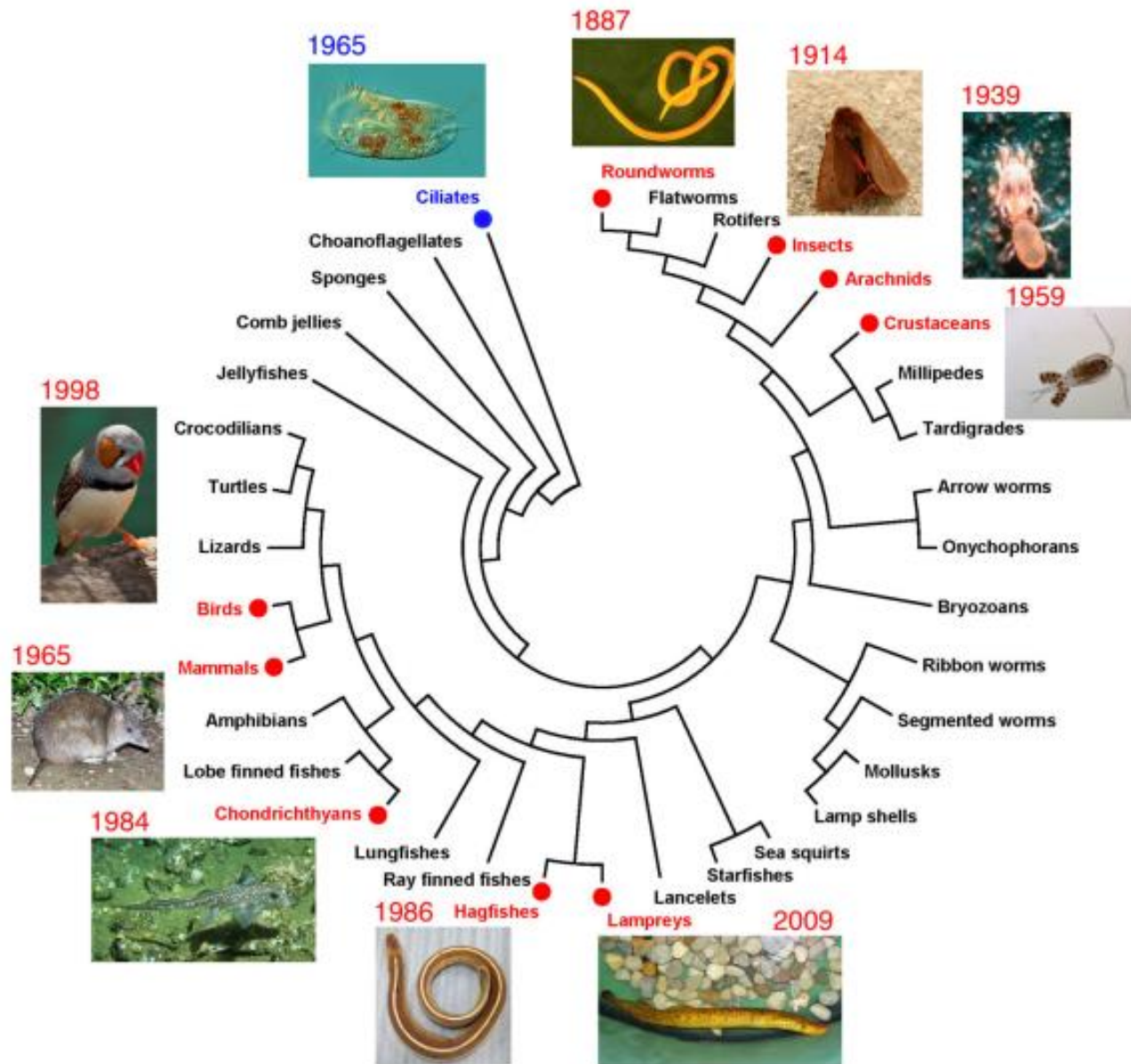


# История ДНК, которой НЕТ в соматических клетках





Wang J, Davis RE. Programmed DNA elimination in multicellular organisms. *Curr Opin Genet Dev.* 2014;27:26-34.



нематоды

насекомые

МИКСИНЫ

МИНОГИ



1887

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1914

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1984

1986

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2019

ЦИКЛОПЫ

млекопитающие

рыбы

ПТИЦЫ



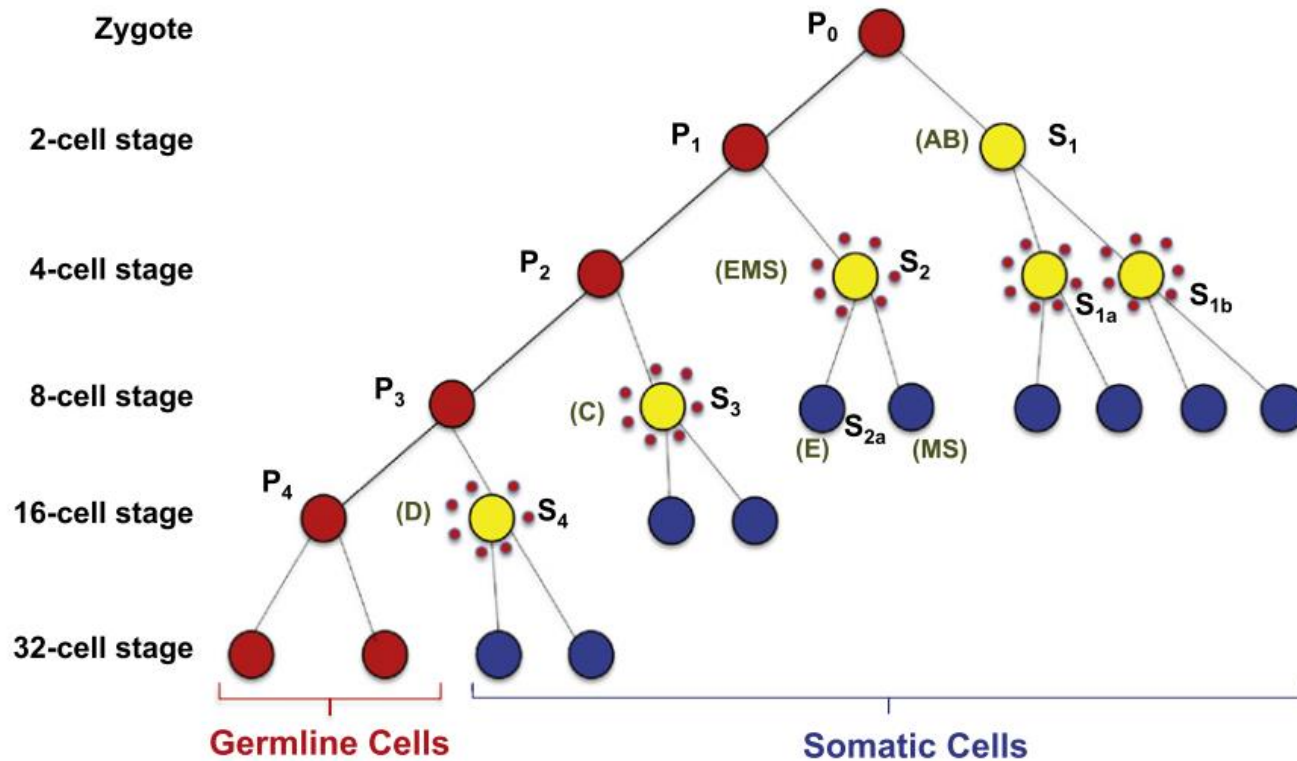
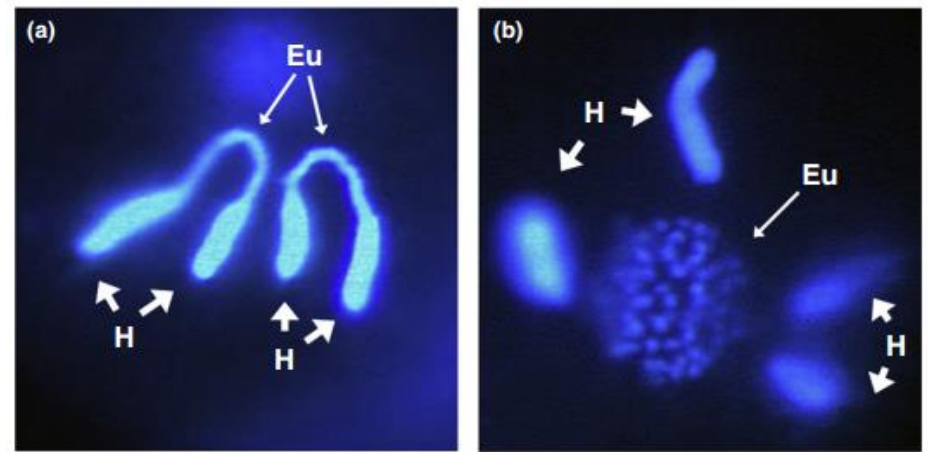


Theodor Boveri  
(1862-1915)



Marcella (O'Grady) Boveri  
(1863-1950)

Streit A, Wang J, Kang Y, Davis RE. Gene silencing and sex determination by programmed DNA elimination in parasitic nematodes. *Curr Opin Microbiol.* 2016;32:120-127.

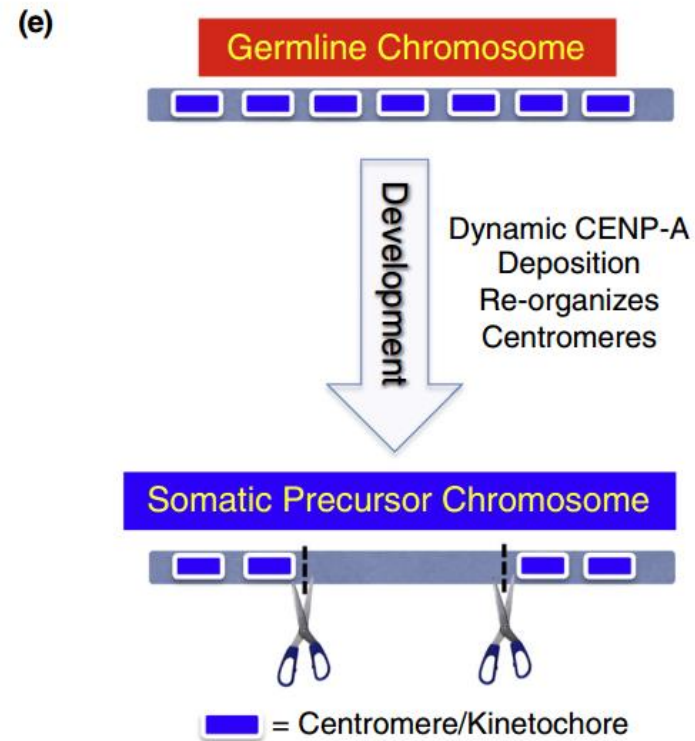
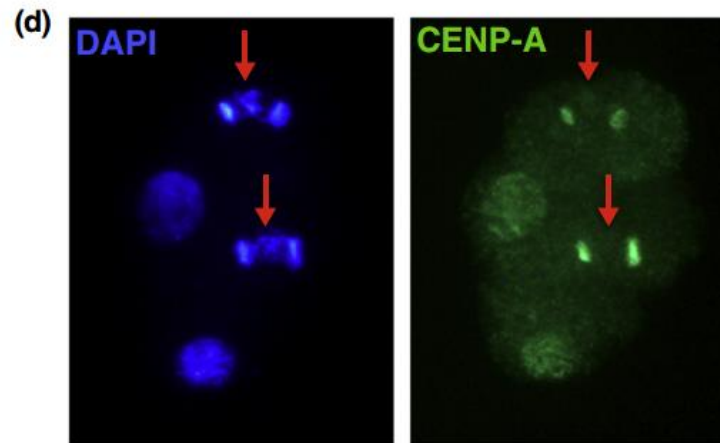
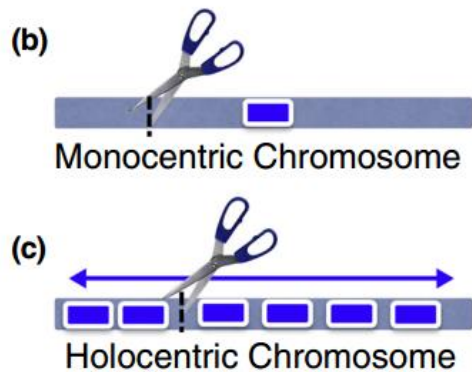
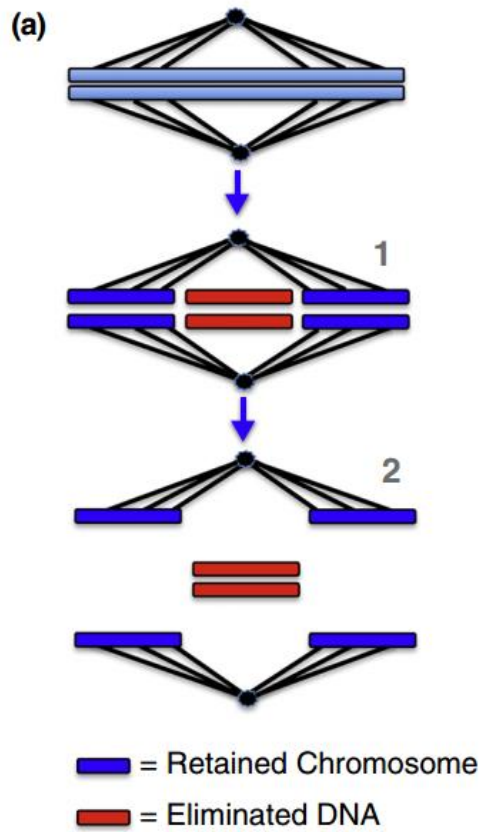


[Dev Cell.](#) 2012 Nov 13;23(5):1072-80. doi: 10.1016/j.devcel.2012.09.020. Epub 2012 Nov 1.

**Silencing of germline-expressed genes by DNA elimination in somatic cells.**

[Wang J<sup>1</sup>](#), [Mitrevva M](#), [Berriman M](#), [Thorne A](#), [Magrini V](#), [Koutsovoulos G](#), [Kumar S](#), [Blaxter ML](#), [Davis RE](#).





Streit A, Wang J, Kang Y, Davis RE. Gene silencing and sex determination by programmed DNA elimination in parasitic nematodes. *Curr Opin Microbiol.* 2016;32:120-127.

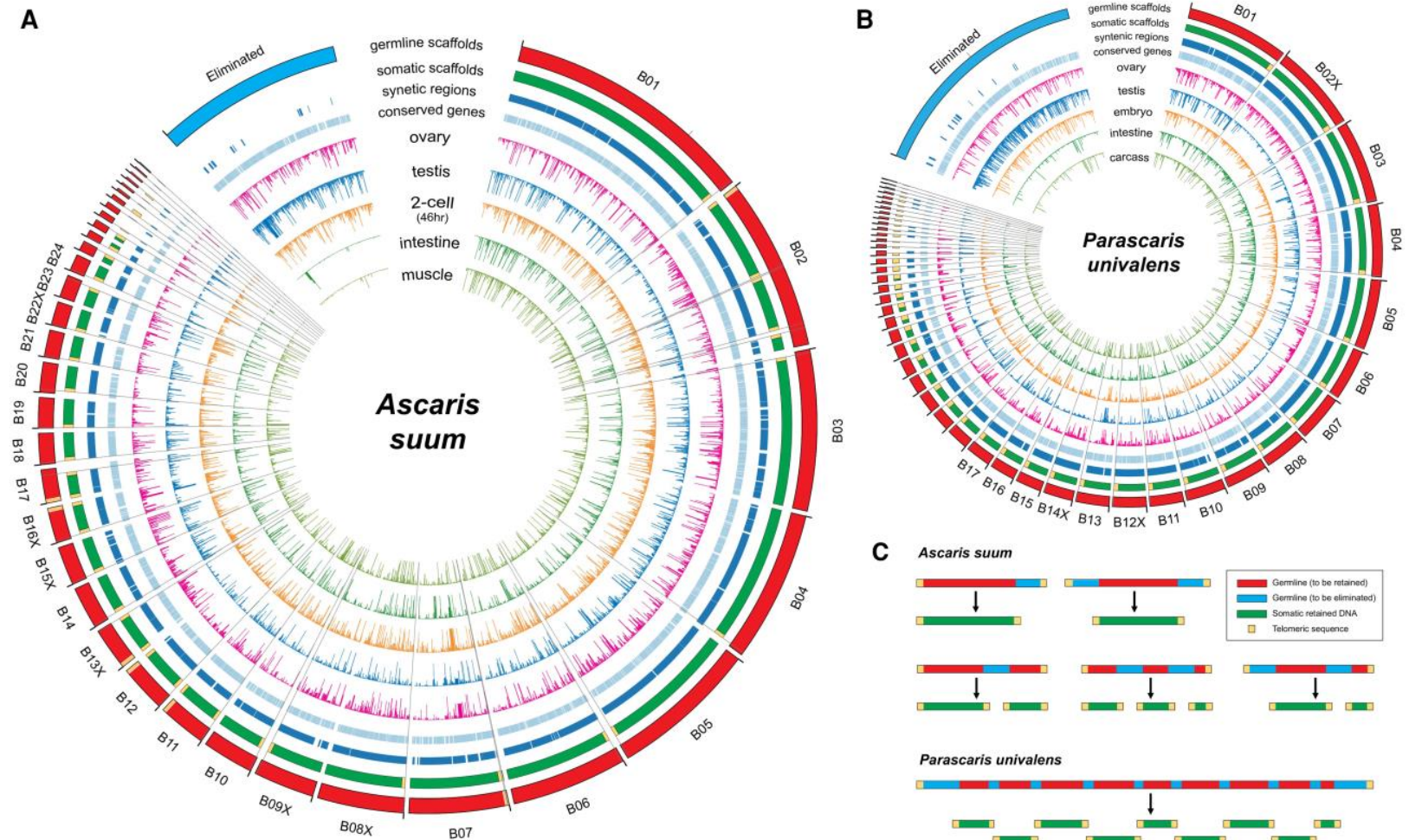
## Silencing of germline-expressed genes by DNA elimination in somatic cells.

Wang J<sup>1</sup>, Mitreva M, Berriman M, Thorne A, Magrini V, Koutsovoulos G, Kumar S, Blaxter ML, Davis RE.

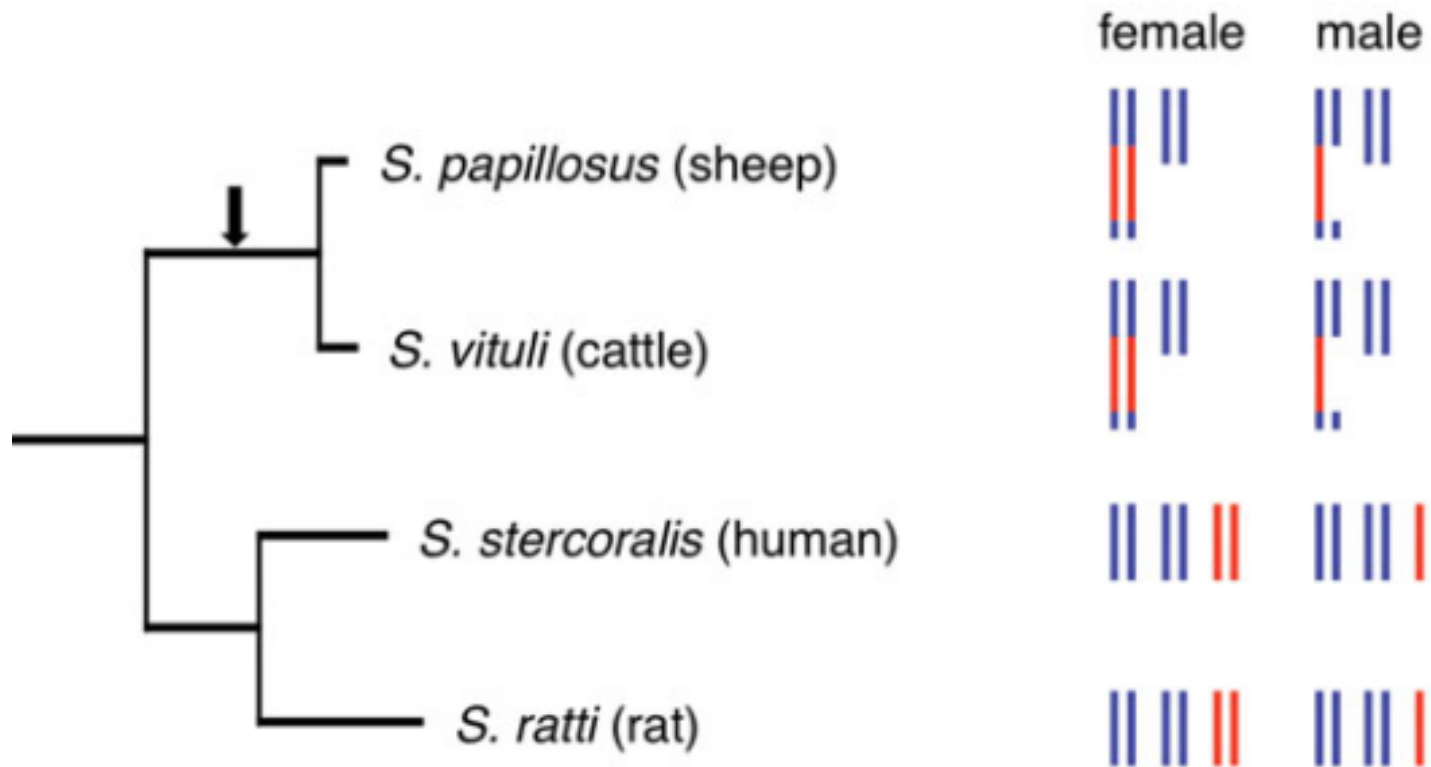
Genome Res. 2017 Dec;27(12):2001-2014. doi: 10.1101/gr.225730.117. Epub 2017 Nov 8.

## Comparative genome analysis of programmed DNA elimination in nematodes.

Wang J<sup>1</sup>, Gao S<sup>1,2</sup>, Mostovoy Y<sup>3</sup>, Kang Y<sup>1</sup>, Zagoskin M<sup>1</sup>, Sun Y<sup>2</sup>, Zhang B<sup>2</sup>, White LK<sup>1</sup>, Easton A<sup>4</sup>, Nutman TB<sup>4</sup>, Kwok PY<sup>3</sup>, Hu S<sup>2</sup>, Nielsen MK<sup>5</sup>, Davis RE<sup>1</sup>.







Kulkarni A, Dyka A, Nemetschke L, Grant WN, Streit A. *Parastrongyloides trichosuri* suggests that XX/XO sex determination is ancestral in Strongyloididae (Nematoda). *Parasitology*. 2013;140:1822-30.



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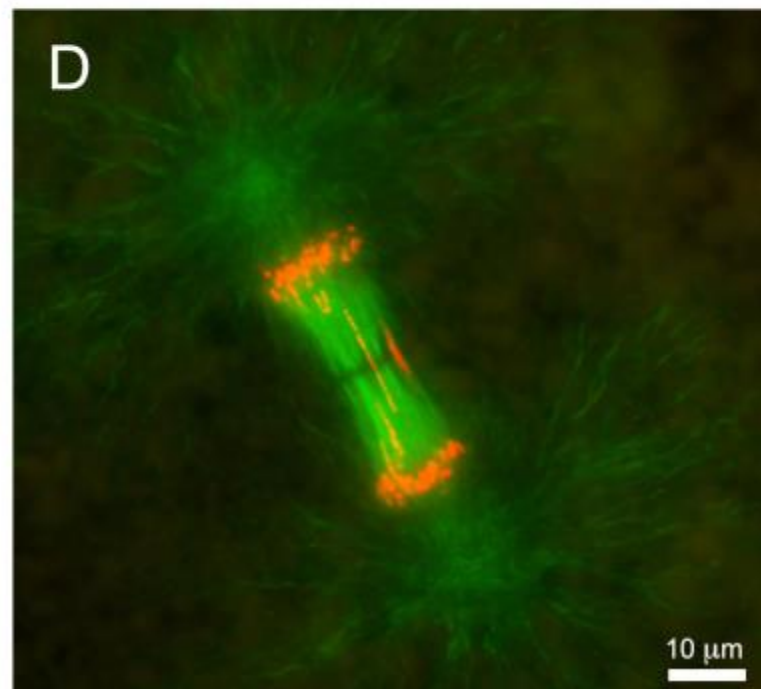
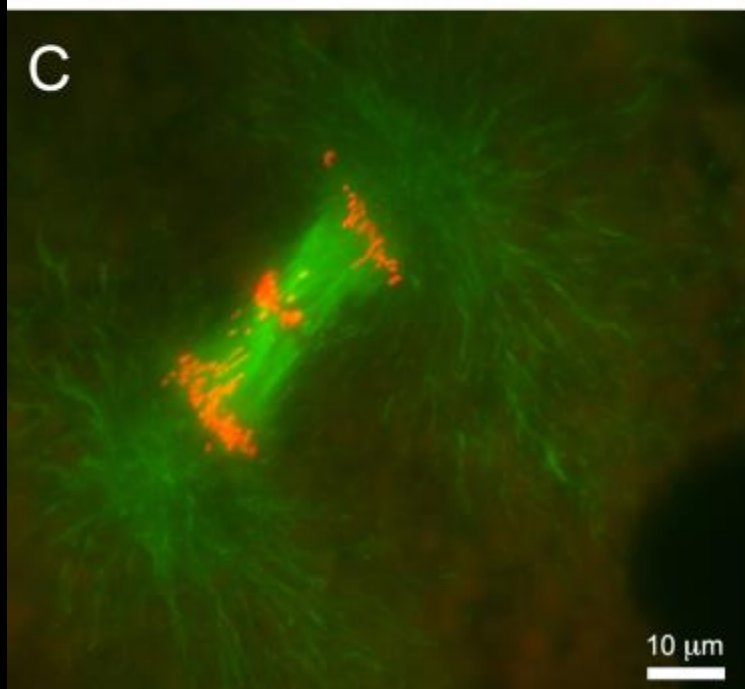
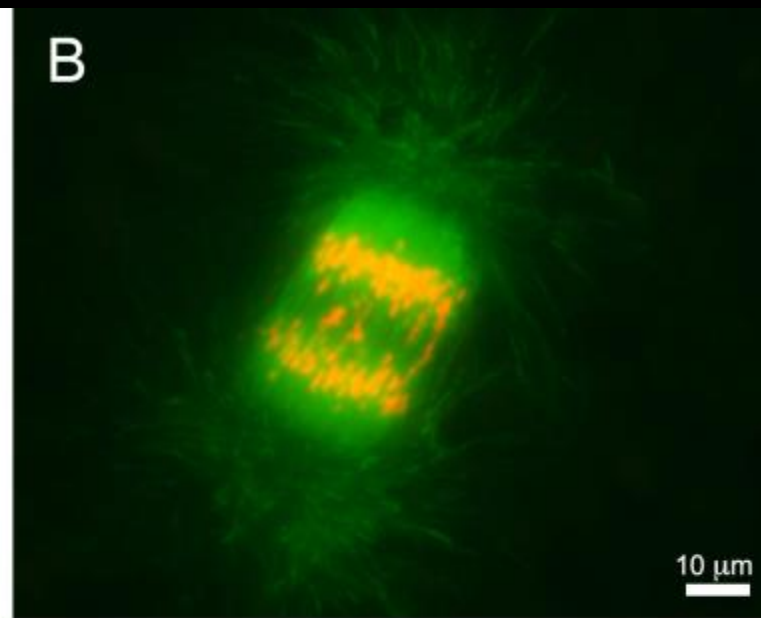
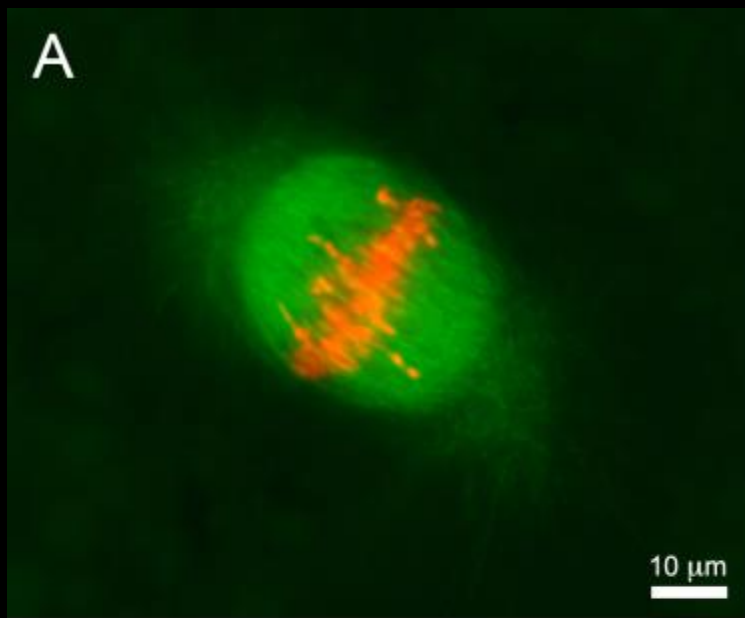
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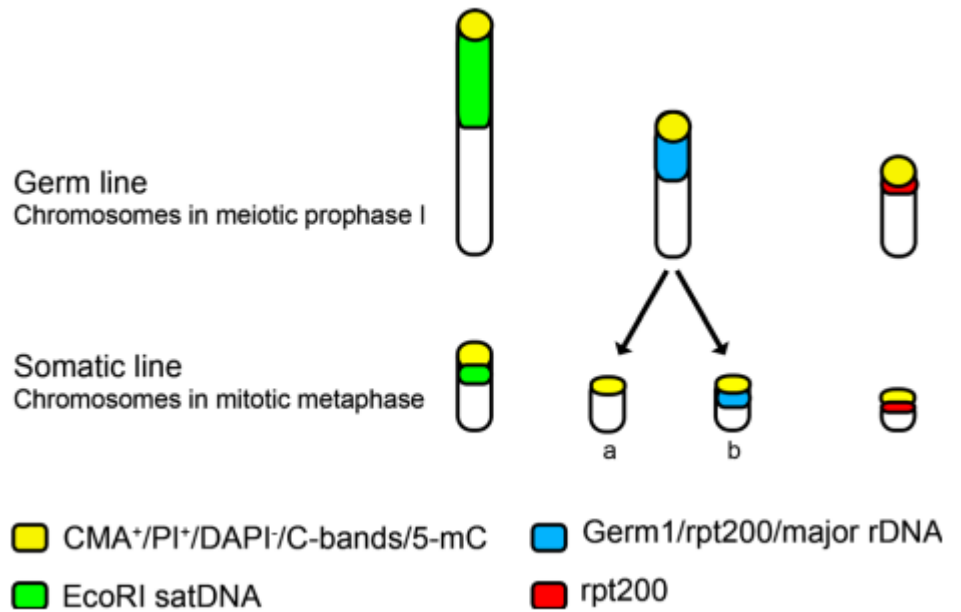
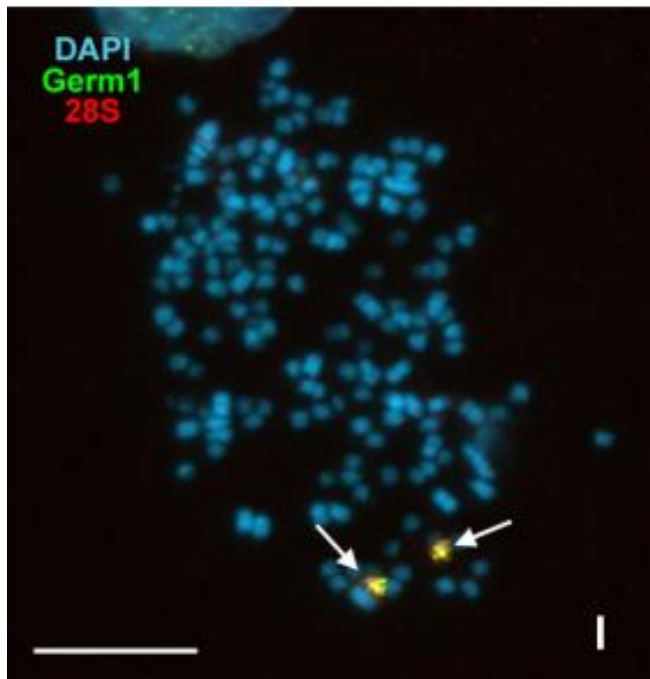
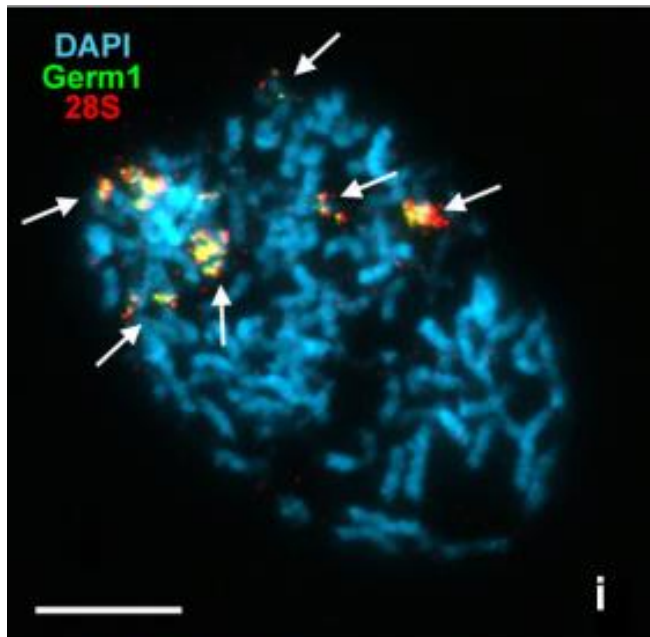




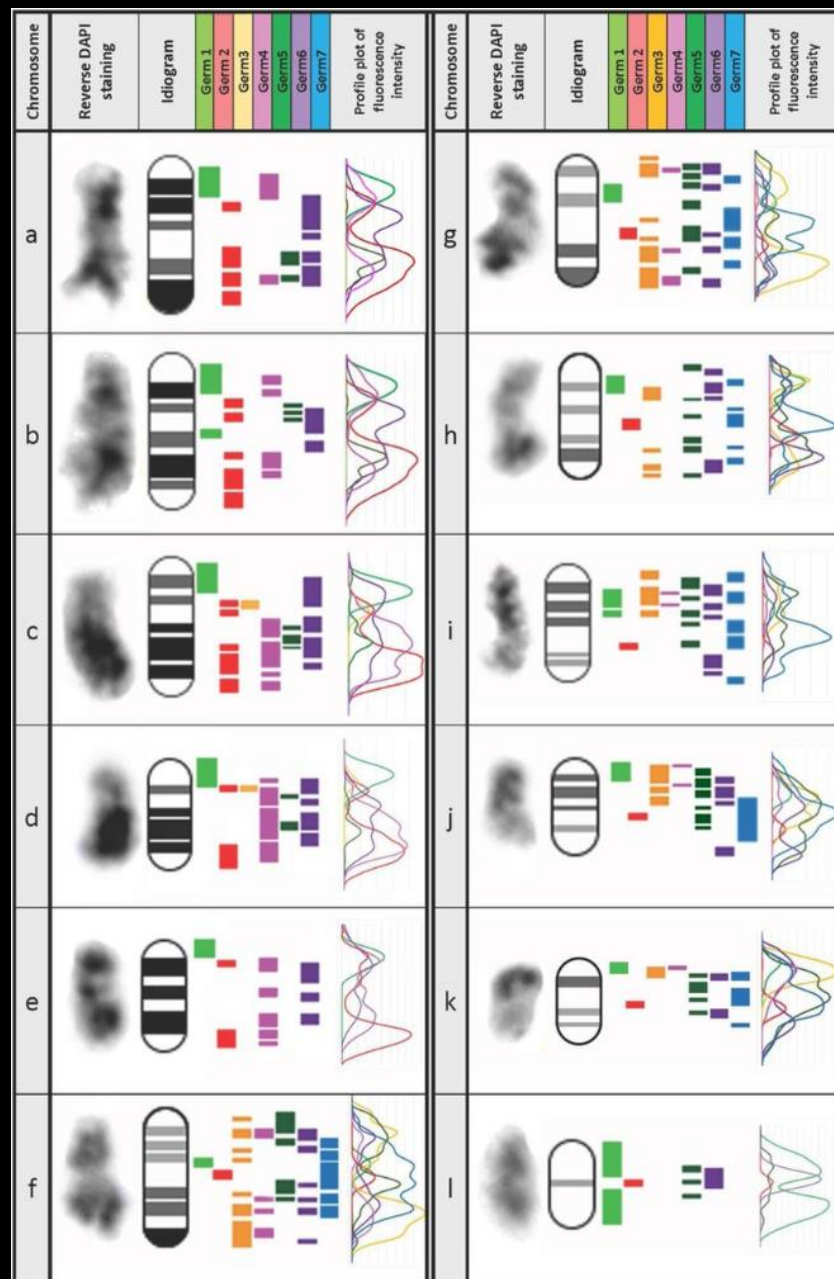
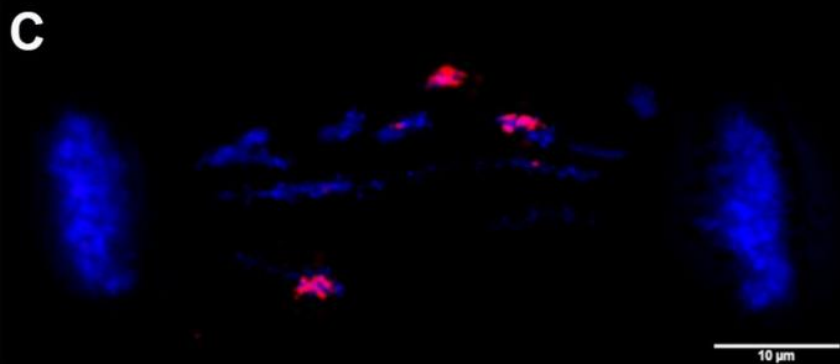
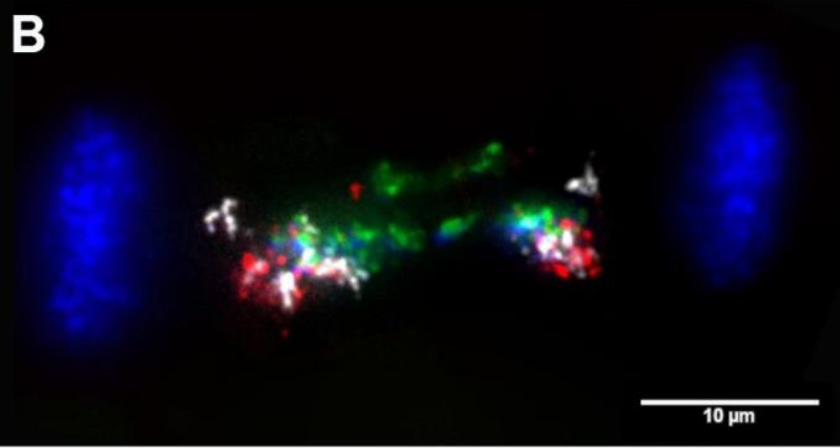
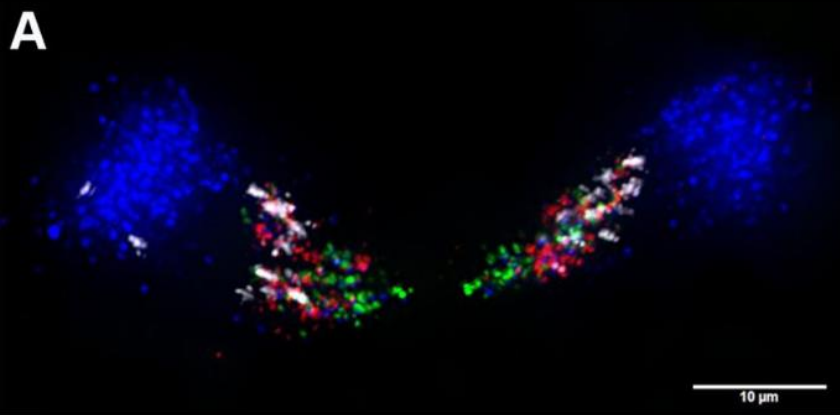


Timoshevskiy VA, Herdy JR, Keinath MC, Smith JJ (2016) Cellular and molecular features of developmentally programmed genome rearrangement in a vertebrate (sea lamprey: *Petromyzon marinus*). *PLoS Genet* 12(6)





Covelo-Soto L, Moran P, Pasantes JJ, Perez-Garcis C. Cytogenetic evidences of genome rearrangement and differential epigenetic chromatin modification in the sea lamprey (*Petromyzon marinus*). *Genetica*. 2014;142:545-554.



# The sea lamprey germline genome provides insights into programmed genome rearrangement and vertebrate evolution

Jeramiah J. Smith <sup>1\*</sup>, Nataliya Timoshevskaya <sup>1,16</sup>, Chengxi Ye <sup>2,16</sup>, Carson Holt<sup>3,16</sup>, Melissa C. Keinath<sup>1,16</sup>, Hugo J. Parker <sup>4,16</sup>, Malcolm E. Cook<sup>4</sup>, Jon E. Hess <sup>5</sup>, Shawn R. Narum <sup>5</sup>, Francesco Lamanna <sup>6</sup>, Henrik Kaessmann<sup>6</sup>, Vladimir A. Timoshevskiy<sup>1</sup>, Courtney K. M. Waterbury<sup>1</sup>, Cody Saraceno<sup>1</sup>, Leanne M. Wiedemann <sup>4,7</sup>, Sofia M. C. Robb<sup>4,8</sup>, Carl Baker<sup>9</sup>, Evan E. Eichler <sup>9,10</sup>, Dorit Hockman<sup>11,14</sup>, Tatjana Sauka-Spengler<sup>11</sup>, Mark Yandell<sup>3</sup>, Robb Krumlauf<sup>4,16</sup>, Greg Elgar<sup>12,16</sup> and Chris T. Amemiya<sup>13,15,16</sup>



нематоды

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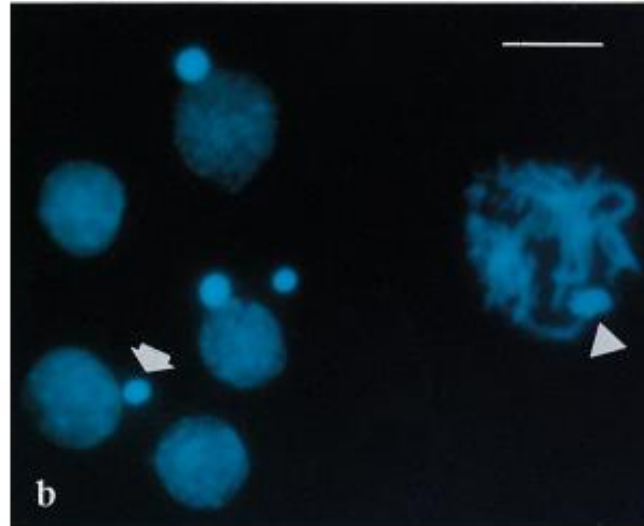
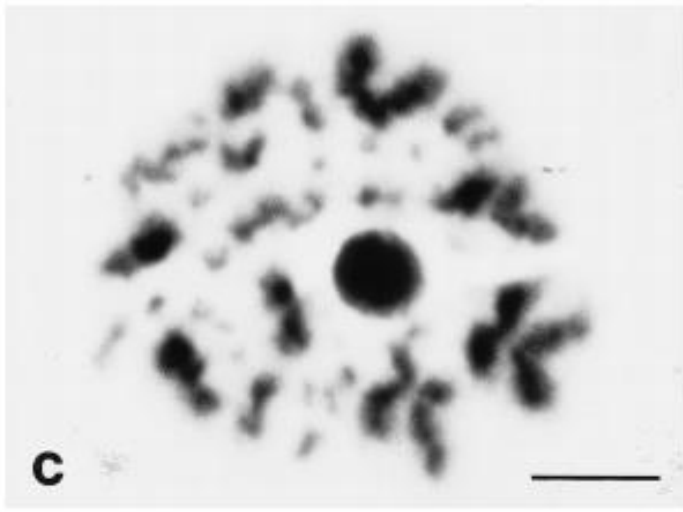
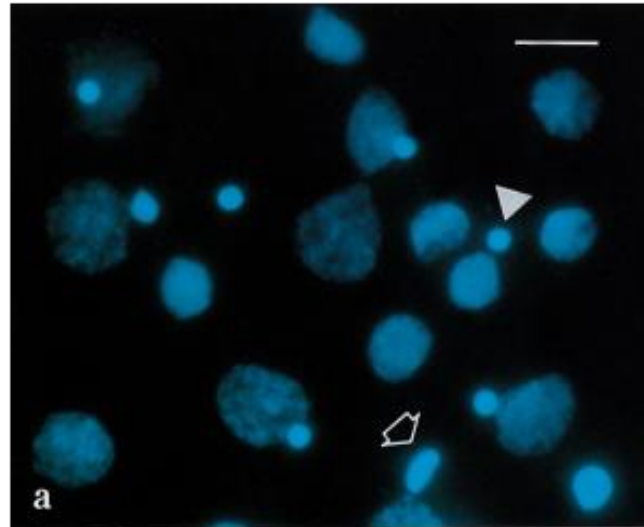
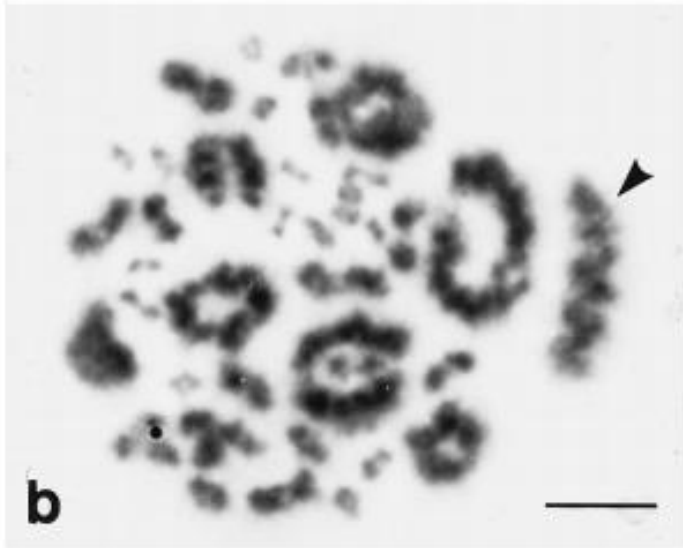
ПТИЦЫ



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Pigozzi MI, Solari AJ. Germ cell restriction and regular transmission of an accessory chromosome that mimics a sex body in the zebra finch, *Taeniopygia guttata*. *Chromosome research*. 1998;62:105-113.

## The germ-line-restricted chromosome in the zebra finch: recombination in females and elimination in males.

Pigozzi MI<sup>1</sup> Chromosoma (2010) 119:325–336  
DOI 10.1007/s00412-010-0260-2

RESEARCH ARTICLE

## Heterochromatin and histone modifications in the germline undergoing elimination

Chromosoma  
DOI 10.1007/s00412-010-0258-9

RESEARCH ARTICLE

Clara Goday · María Inés I

## Meiotic silencing and fragmentation of the male germline restricted chromosome in zebra finch

Sam Schoenmakers · Evelyne Wassenaar ·  
Joop S. F. ...  
Willy N

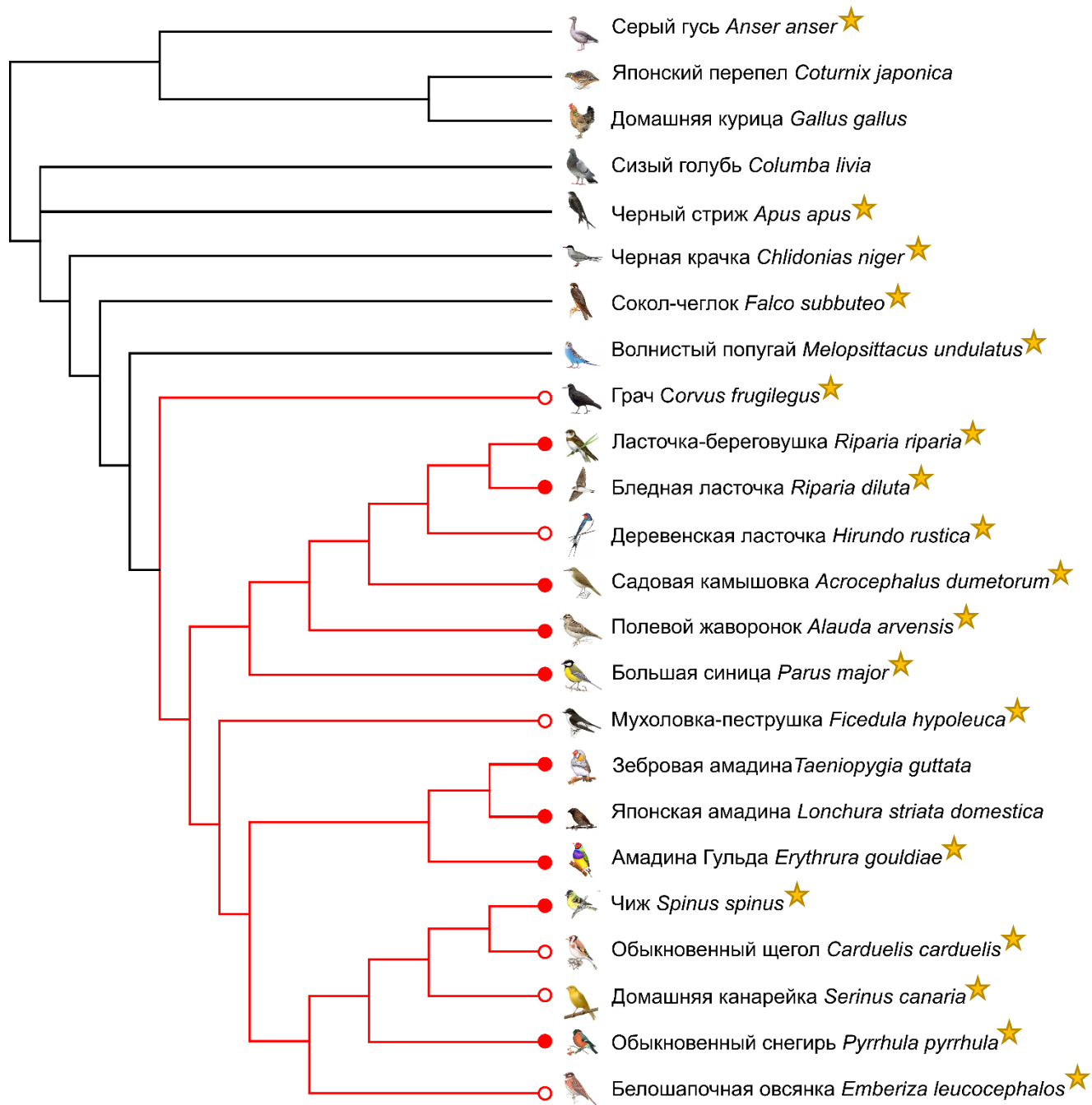
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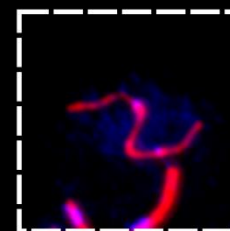
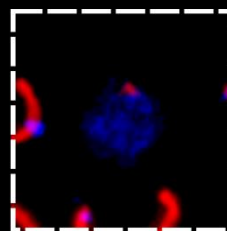
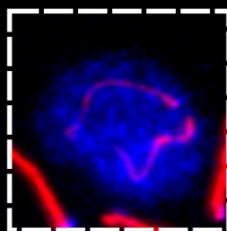
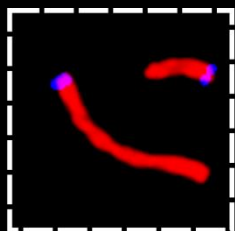
RESEARCH ARTICLE

## Histone modifications related to chromosome silencing and elimination during male meiosis in Bengalese finch

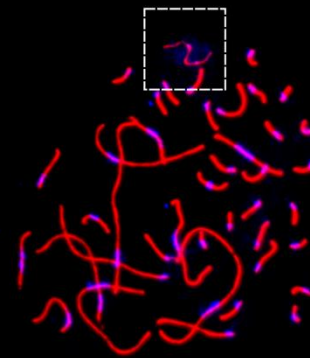
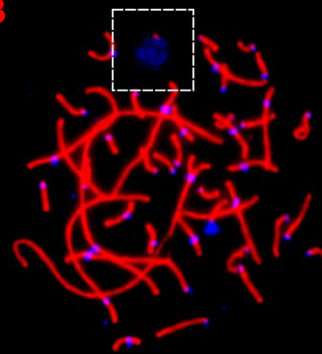
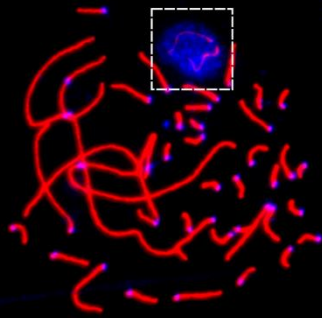
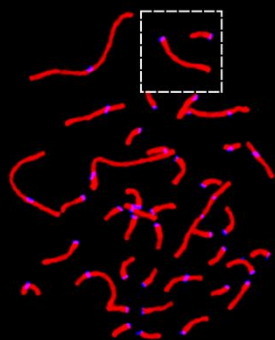
Lucía del Priore · María Inés Pigozzi







DAPI  
SYCP3



Большая синица

♀

Полевой жаворонок

♂

Грач

♂

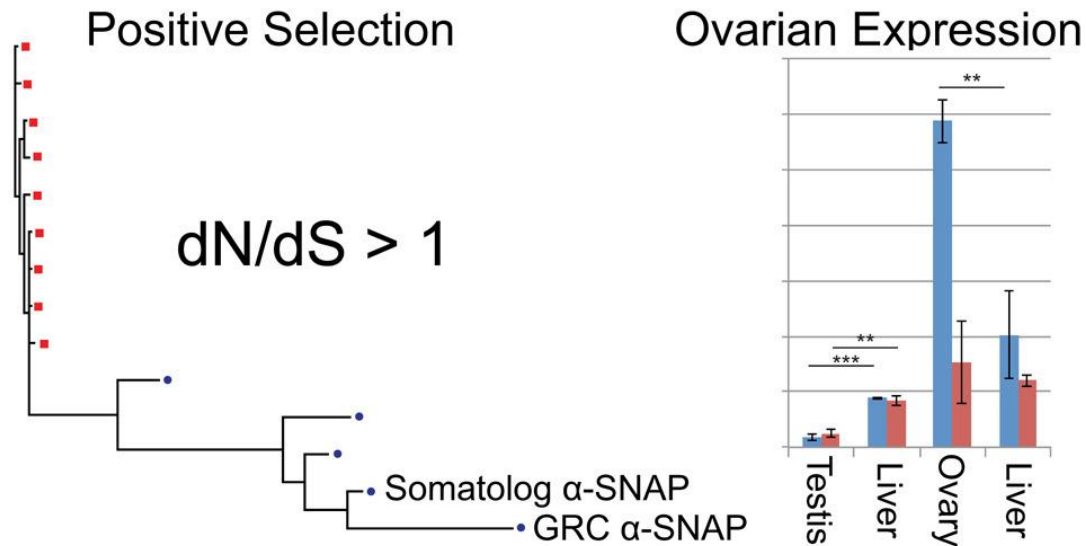
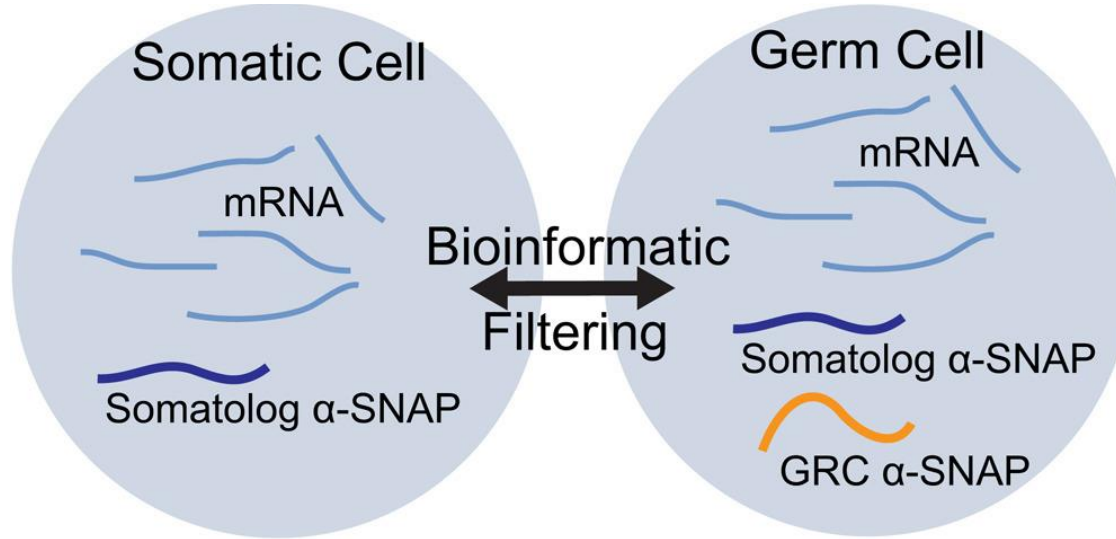
Мухоловка-пеструшка

♂



## Discovery of the First Germline-Restricted Gene by Subtractive Transcriptomic Analysis in the Zebra Finch, *Taeniopygia guttata*.












Biederman MK<sup>1</sup>, Nelson MM<sup>1</sup>, Asalone KC<sup>1</sup>, Pedersen AL<sup>1</sup>, Saldanha CJ<sup>1</sup>, Bracht JR<sup>2</sup>.





New Results

## **Germline-Restricted Chromosome (GRC) is Widespread among Songbirds**

 Anna A Torgasheva,  Lyubov P Malinovskaya,  Kira S Zadesenets,  Tatyana V Karamysheva,  Elena A Kizilova,  Inna E Pristyazhnyuk,  Elena P Shnaider,  Valeria A Volodkina,  Alsu F Saifutdinova,  Svetlana A Galkina,  Denis M Larkin,  Nikolay B Rubtsov,  Pavel M Borodin

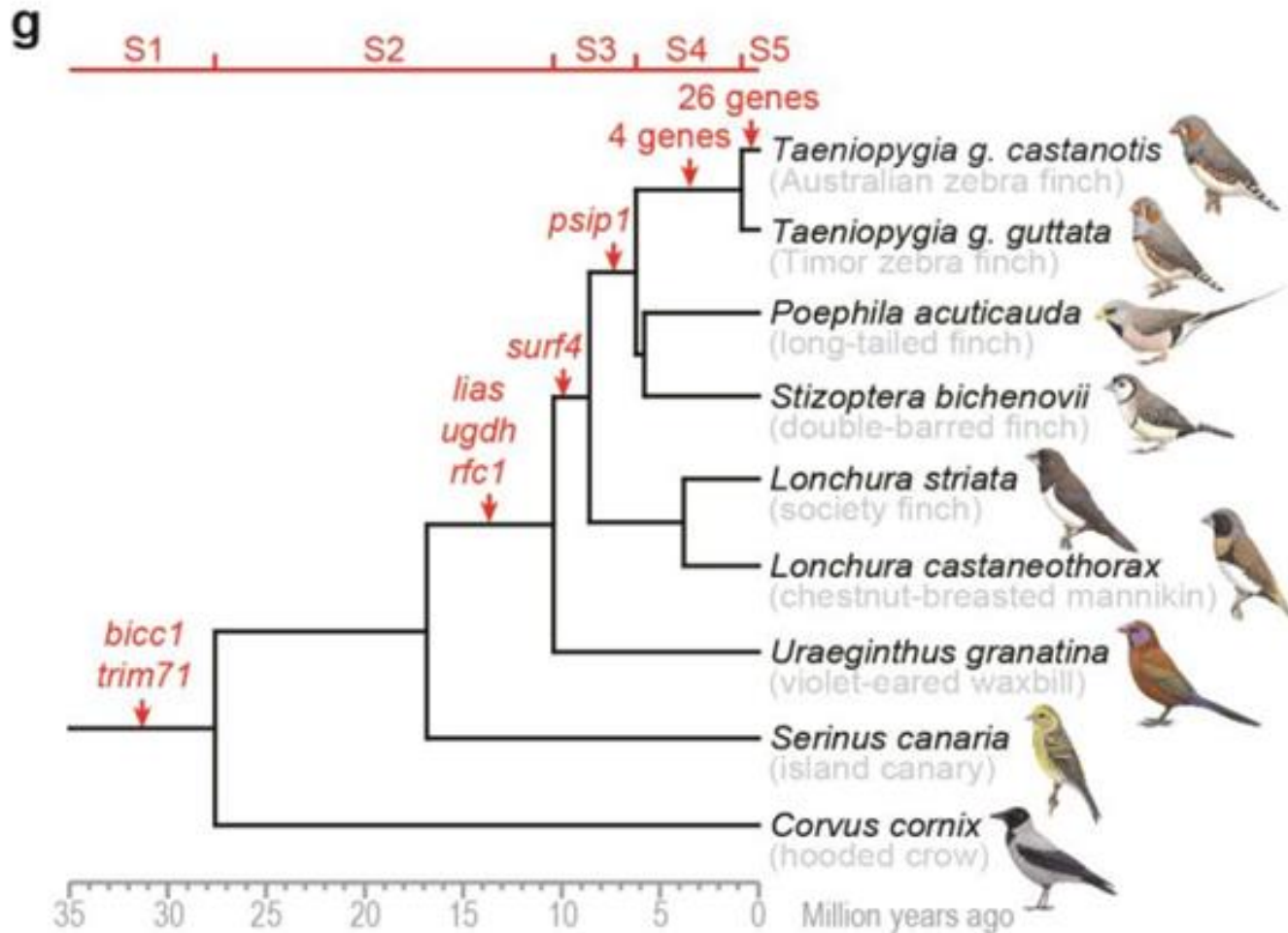
**doi:** <https://doi.org/10.1101/414276>

# Programmed DNA elimination of germline development genes in songbirds

Cormac M. Kinsella, Francisco J. Ruiz-Ruano, Anne-Marie Dion-Côté, Alexander J. Charles, Toni I. Gossmann, Josefa Cabrero, Dennis Kappei, Nicola Hemmings, Mirre J. P. Simons, Juan P. M. Camacho, Wolfgang Forstmeier, Alexander Suh

doi: <https://doi.org/10.1101/444364>

This article is



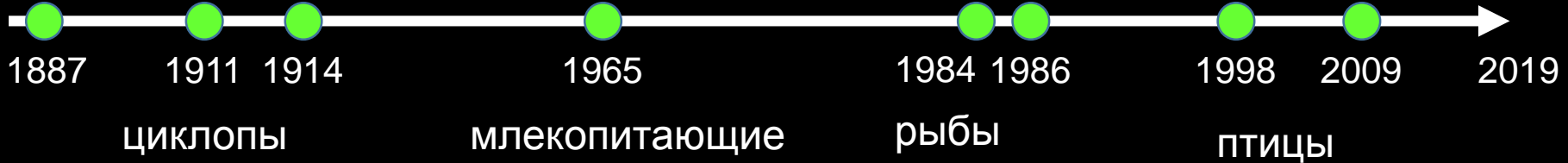


нематоды

насекомые

миксины

миноги



циклопы

млекопитающие

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птицы

