

# SBS1

**C > A**

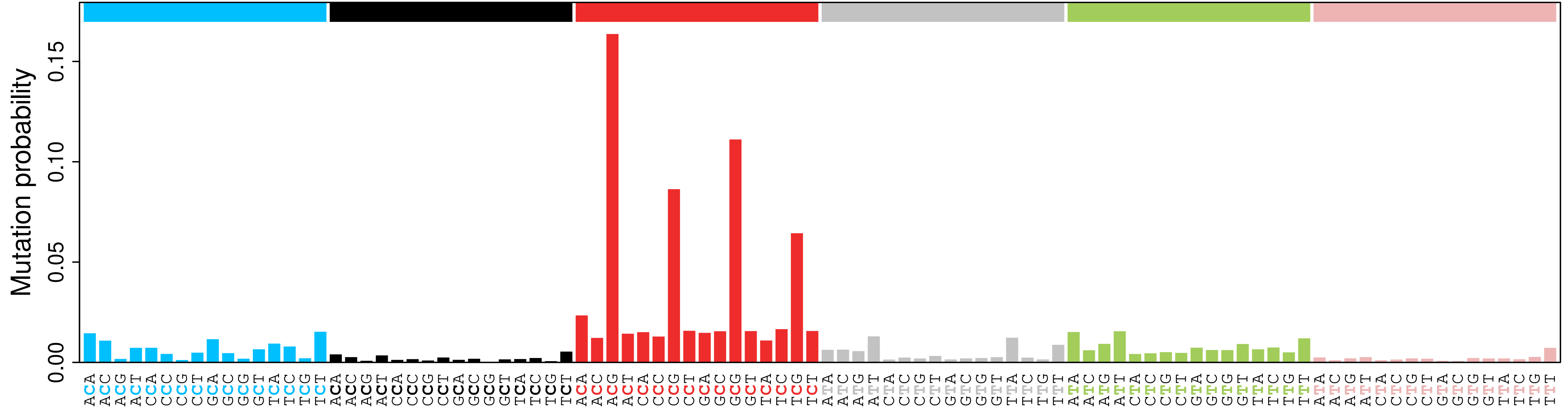
C > G

$C > T$

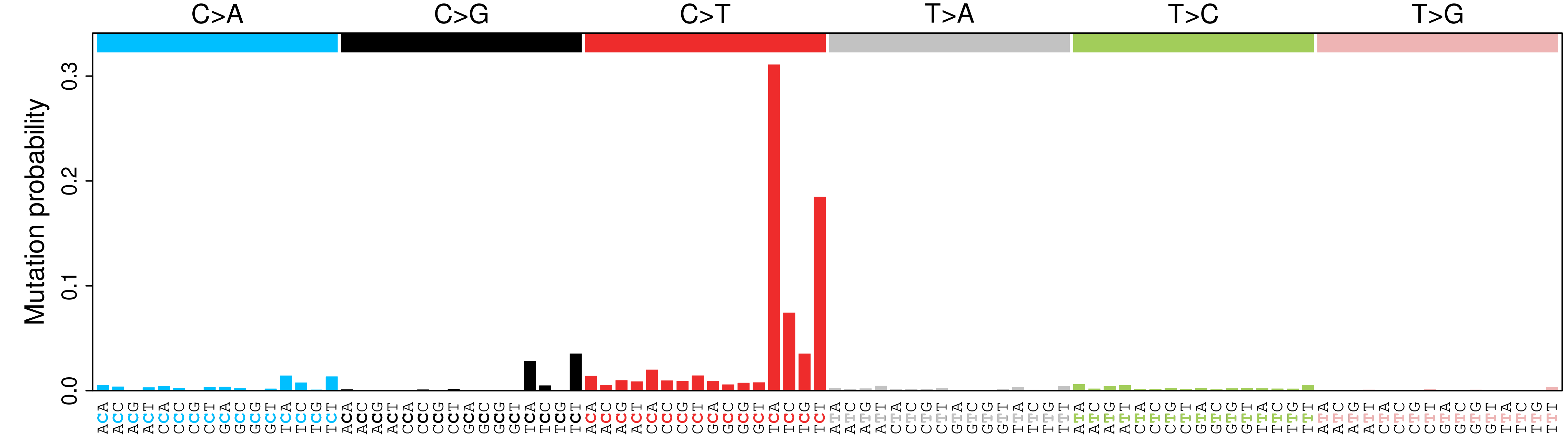
**T > A**

$T > C$

T>G



# SBS2



# SBS3

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT

# SBS4

$C > A$

C > G

$C > T$

**T>A**

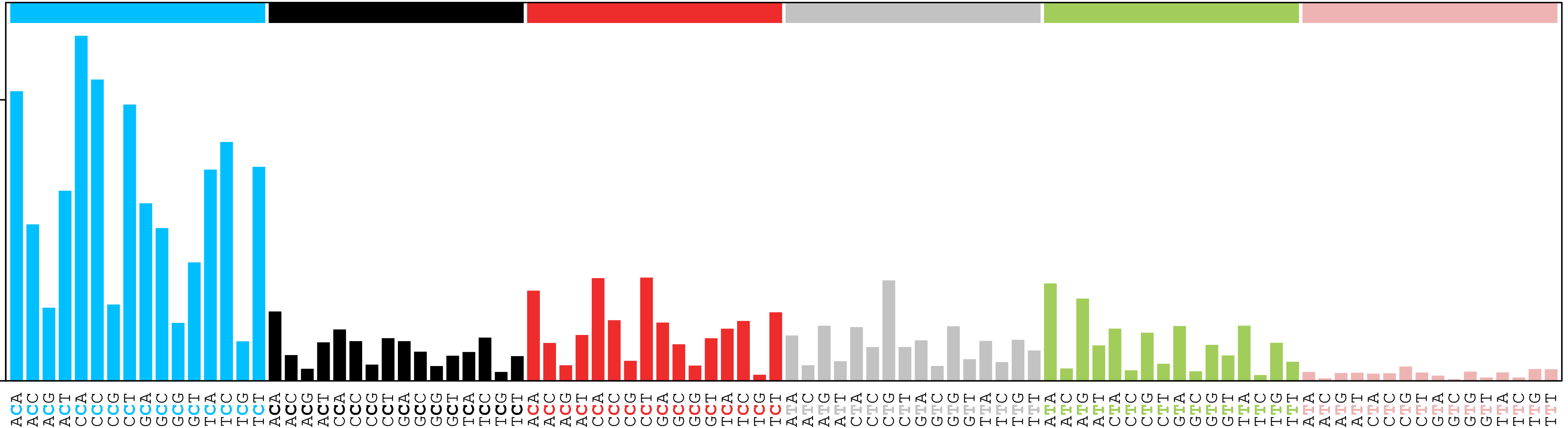
$$T > C$$

$T > G$

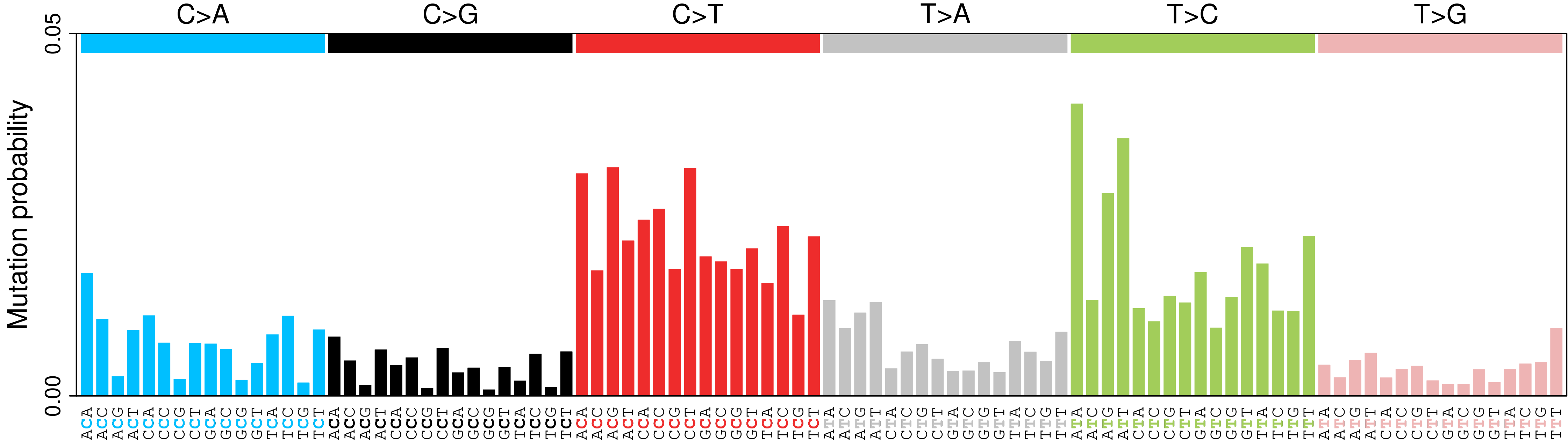
# Mutation probability

0.05

0.00



# SBS5



# SBS6

**C > A**

C > G

$C > T$

**T > A**

$T > C$

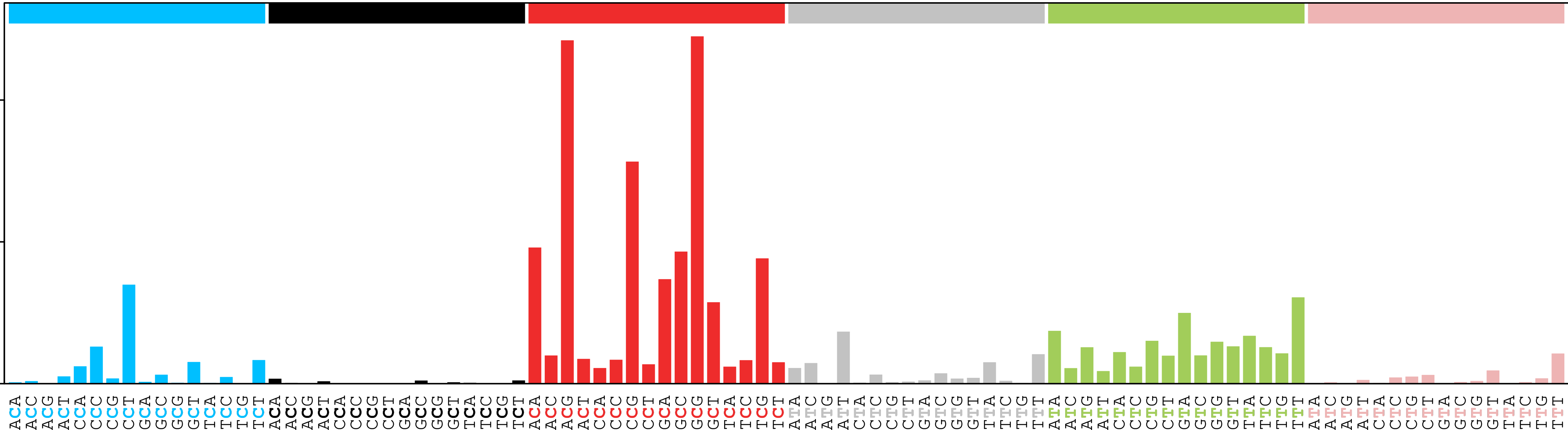
T>G

# Mutation probability

0.10

50.0

0.00



# SBS7a

$C > A$

C > G

$C > T$

**T > A**

$T > C$

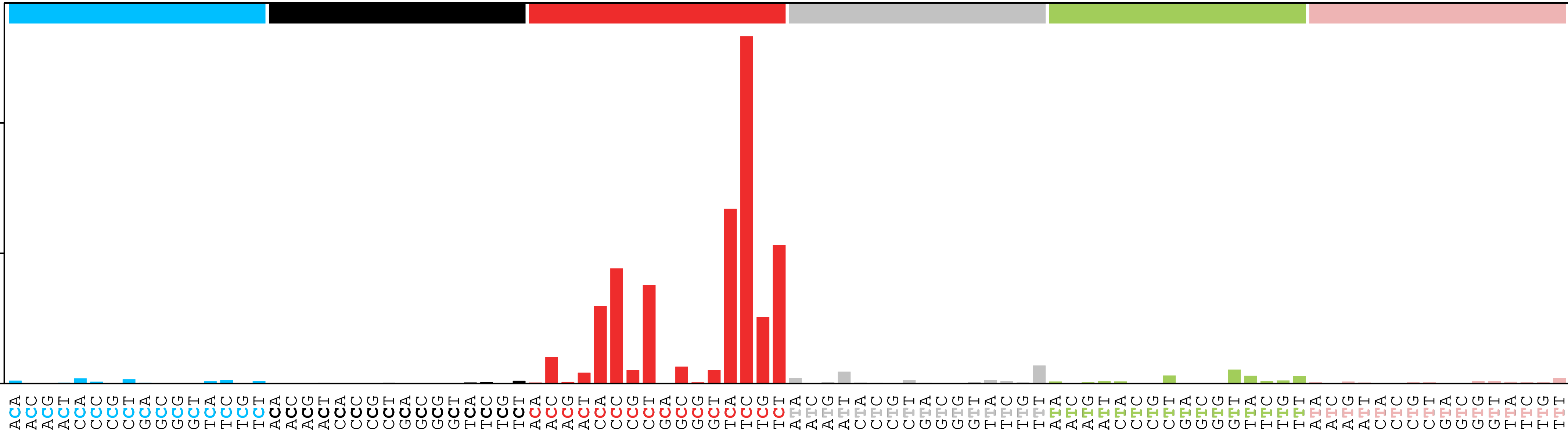
T>G

# Mutation probability

## 0.2

0.1

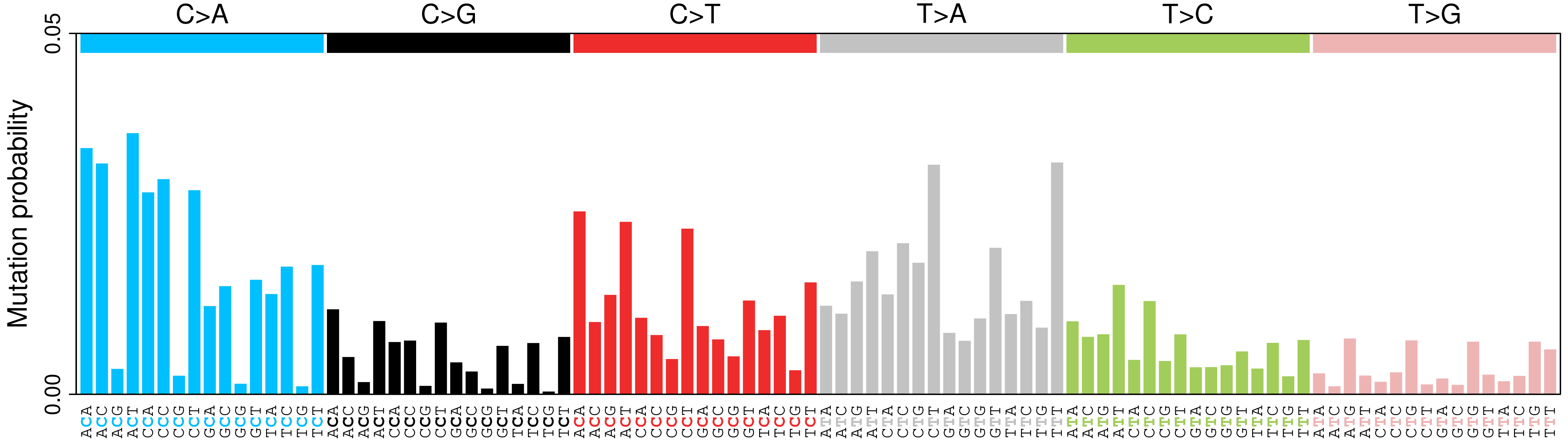
0.0







# SBS8



# SBS9

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.10

0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT



# SBS10d

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.20  
0.15  
0.10  
0.05  
0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GCA GCC GGT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT



# SBS12

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT

# SBS13

C>A

C>G

C>T

T>A

T>C

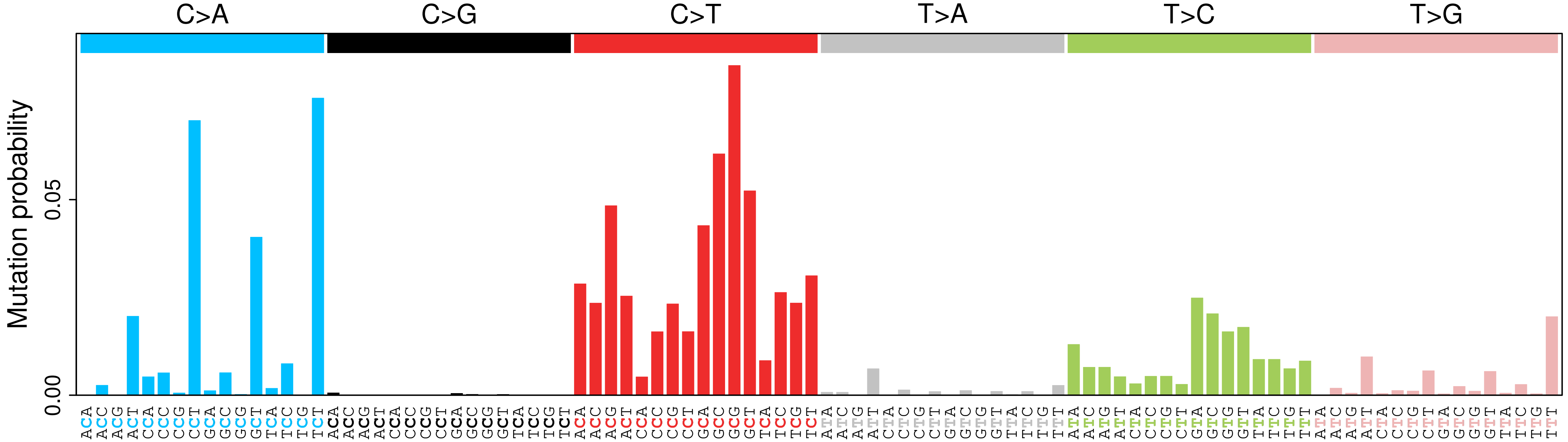
T>G

Mutation probability

0.20  
0.15  
0.10  
0.05  
0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT

# SBS14





# SBS15

**C > A**

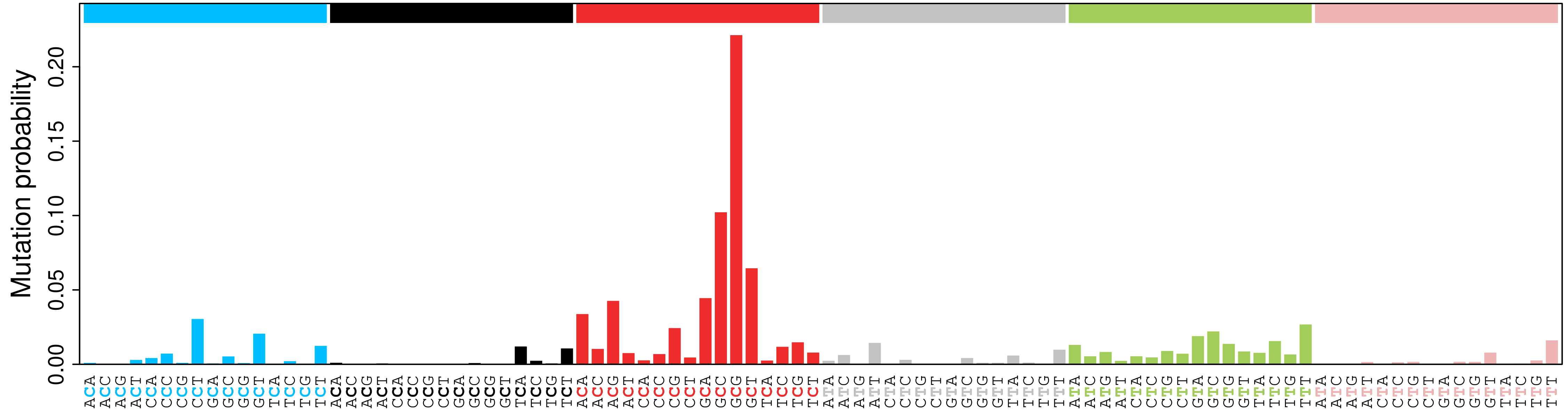
C > G

$C > T$

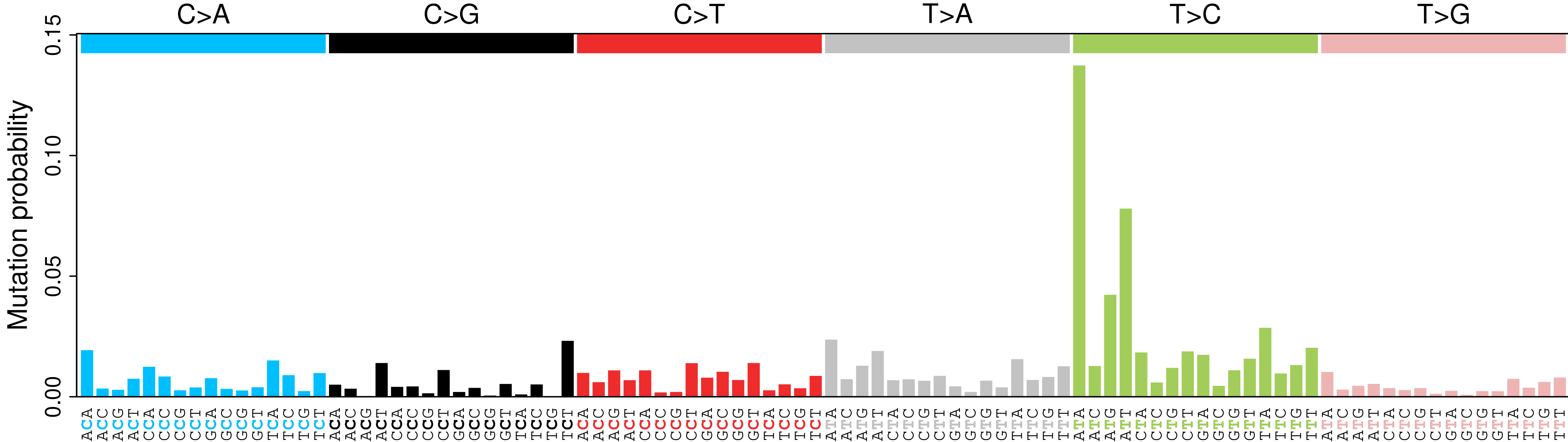
**T > A**

$T > C$

T>G



# SBS16



# SBS17

C>A

C>G

C>T

T>A

T>C

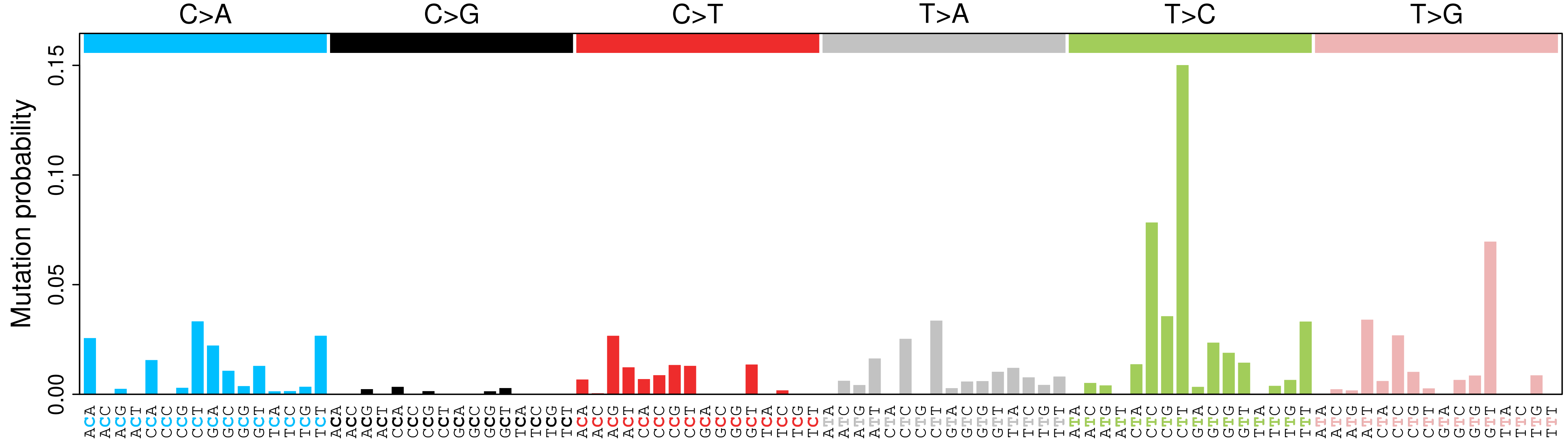
T>G

Mutation probability

0.20  
0.15  
0.10  
0.05  
0.00



# SBS17a



# SBS18

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.10

0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGG GGT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGG GGT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGG GGT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT

# SBS19

**C > A**

C > G

$C > T$

**T > A**

$T > C$

T>G

# Mutation probability

## 0.2

0.1

0

[illegible]

# SBS20



# SBS22

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.10

0.05

0.00

ACA ACC AGC ACT CCA CCC CGC CCT GCA GCC GGC GTG TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CGC CCT GCA GCC GGC GTG TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CGC CTT GCA GCC GGC GTG TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT



# SBS23



# SBS24





# SBS28



# SBS30

**C > A**

C > G

$C > T$

**T > A**

$T > C$

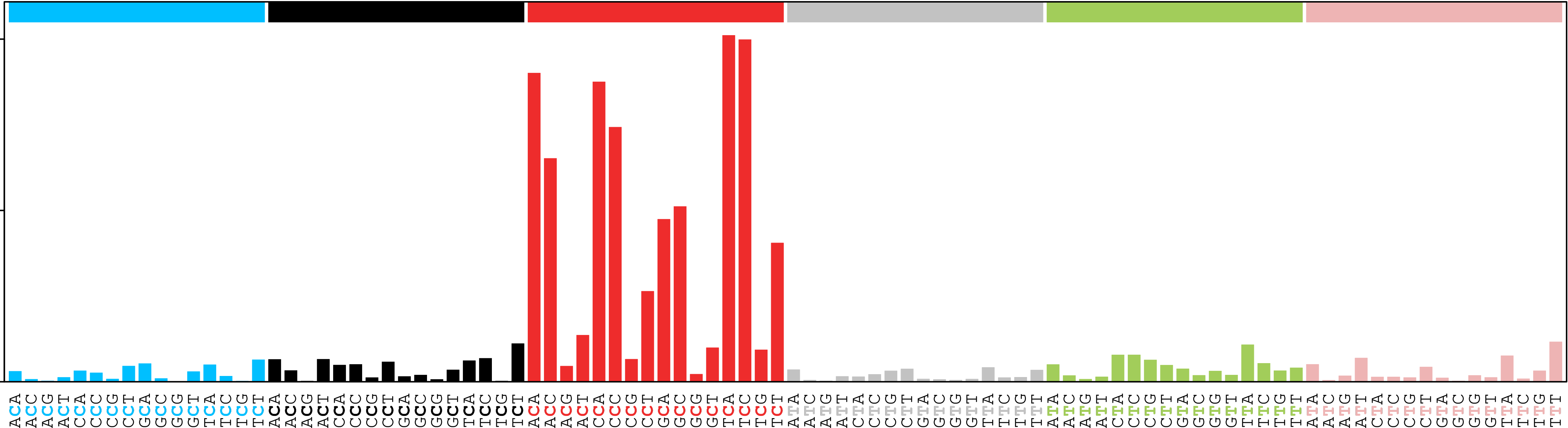
T>G

# Mutation probability

0.10

0.05

0.00







# SBS33

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.2  
0.1  
0.0





# SBS35



# SBS38

**C > A**

C > G

$C > T$

**T > A**

$T > C$

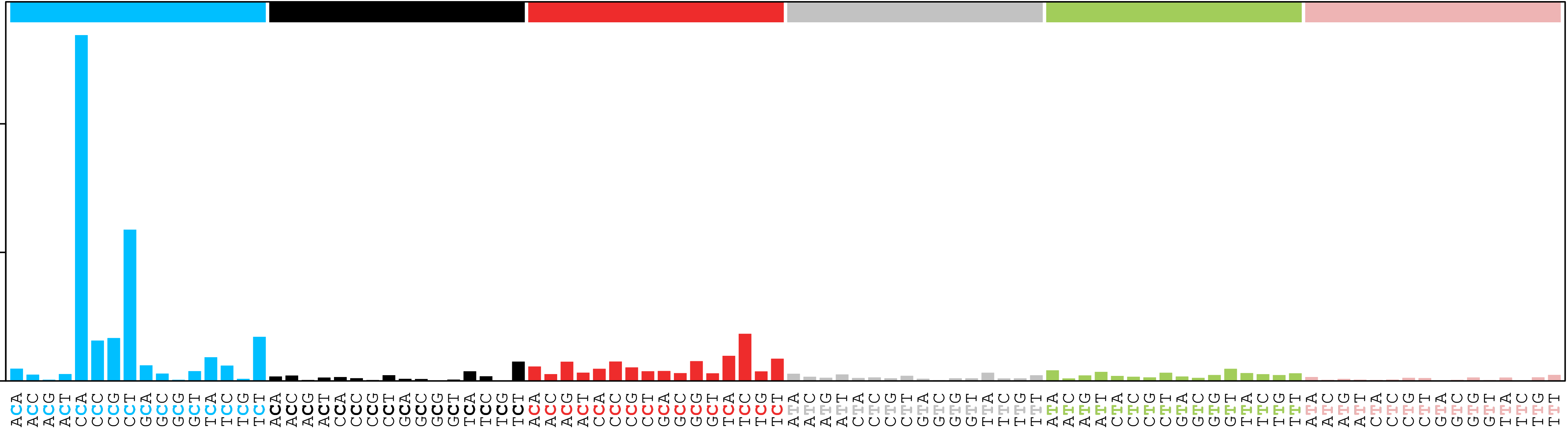
T>G

# Mutation probability

## 0.2

## 0.1

0.0



# SBS44

**C > A**

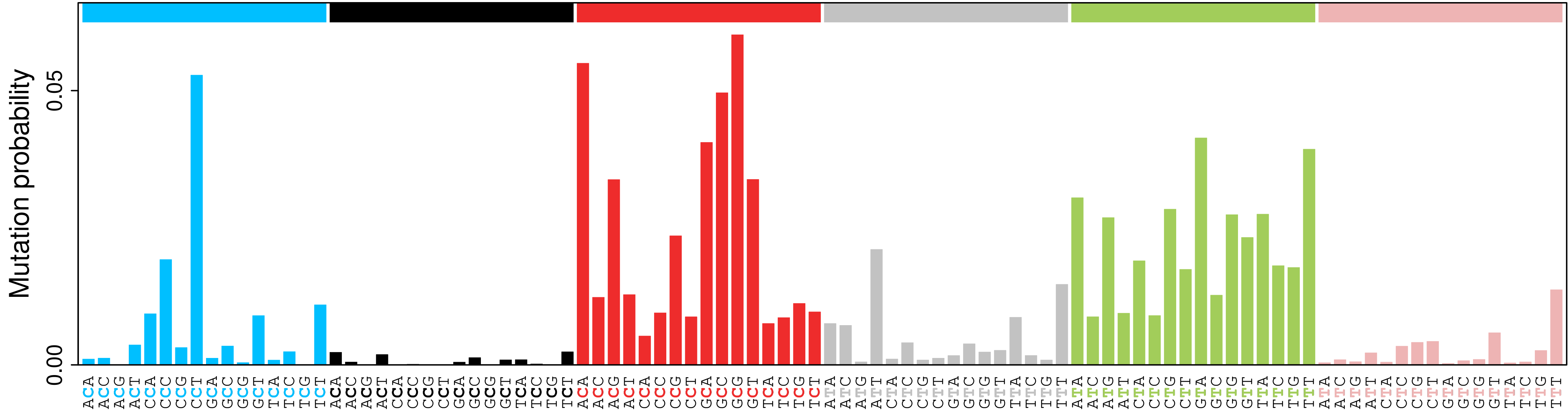
C > G

$C > T$

**T > A**

$T > C$

T>G





# SBS53

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.10

0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT

# SBS57

C>A

C>G

C>T

T>A

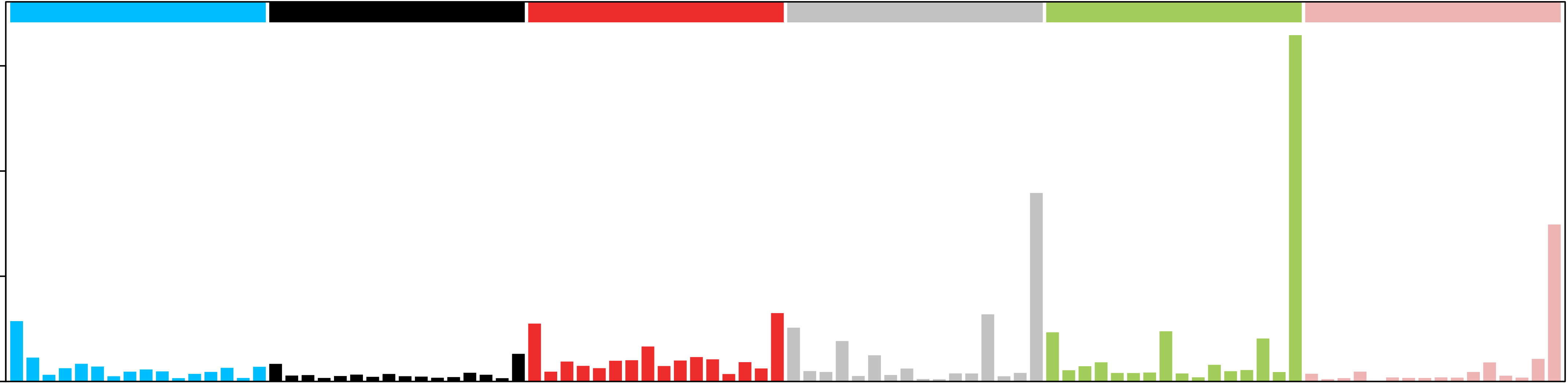
T>C

T>G

Mutation probability

0.15  
0.10  
0.05  
0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TCC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TCC TTG TTT



# SBS84

**C > A**

C > G

$C > T$

**T > A**

$$T > C$$

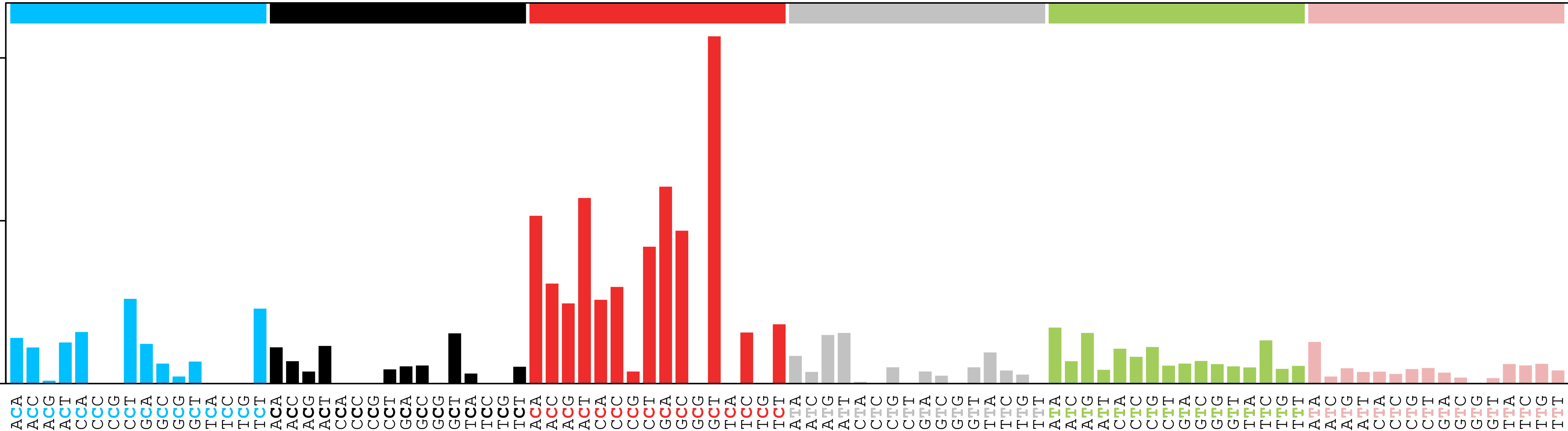
$T > G$

# Mutation probability

0.10

0.05

0.0







# SBS88

C>A

C>G

C>T

T>A

T>C

T>G

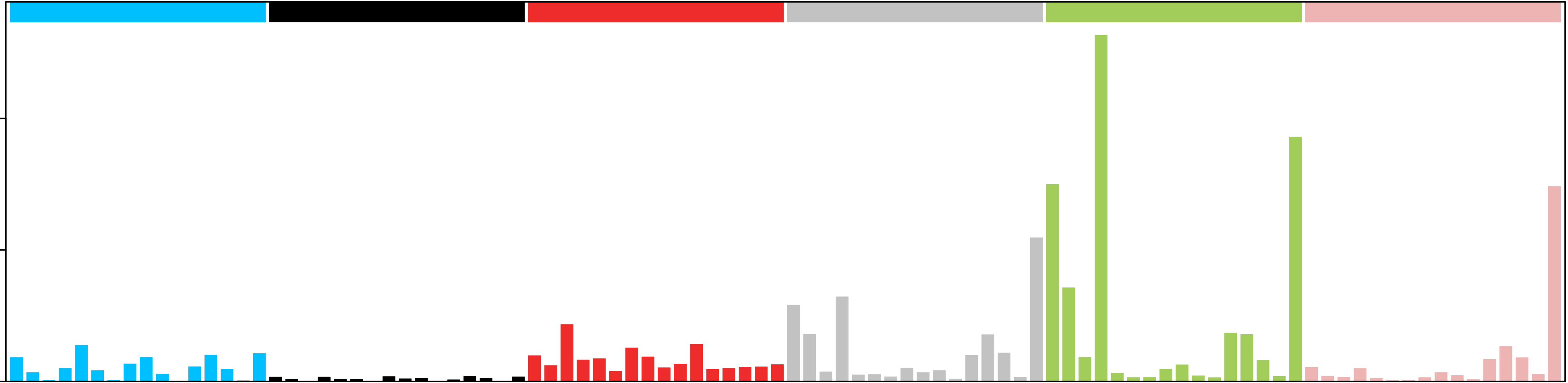
Mutation probability

0.10

0.05

0.00

ACA ACC AGC ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT



# SBS90

$C > A$

C > G

$C > T$

**T > A**

$T > C$

T>G

# Mutation probability

0.00 0.05 0.10 0.15 0.20

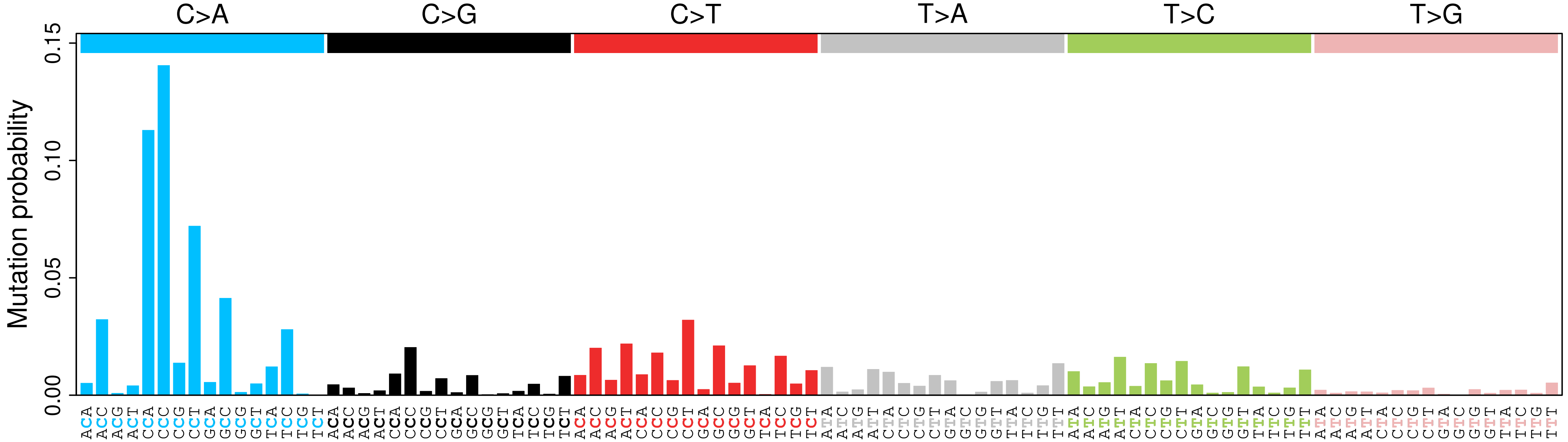




# SBS93



# SBS94



# SBS95

C>A

C>G

C>T

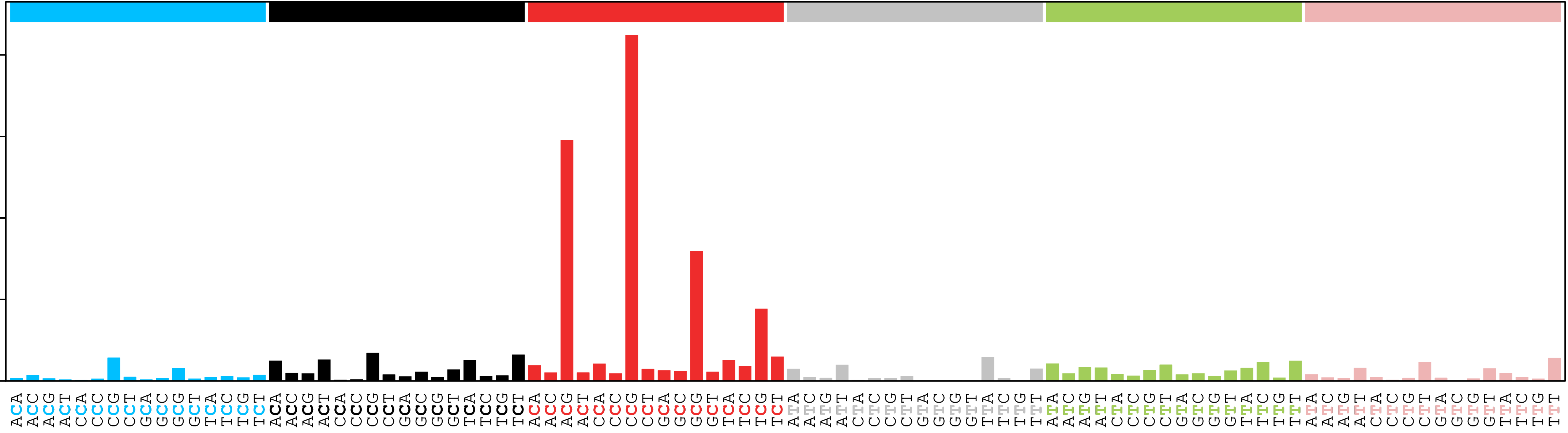
T>A

T>C

T>G

Mutation probability

0.20  
0.15  
0.10  
0.05  
0.00





# SBS97

**C > A**

C > G

$C > T$

**T > A**

$T > C$

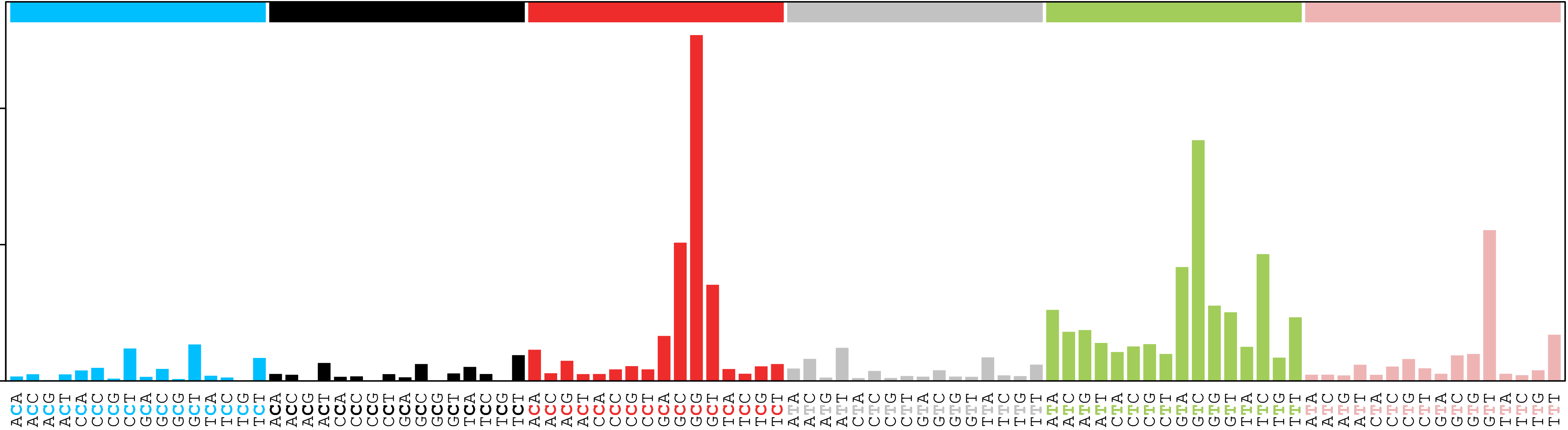
T>G

# Mutation probability

0.10

50

0.00





# SBS98



# SBS99

**C > A**

C > G

$C > T$

**T > A**

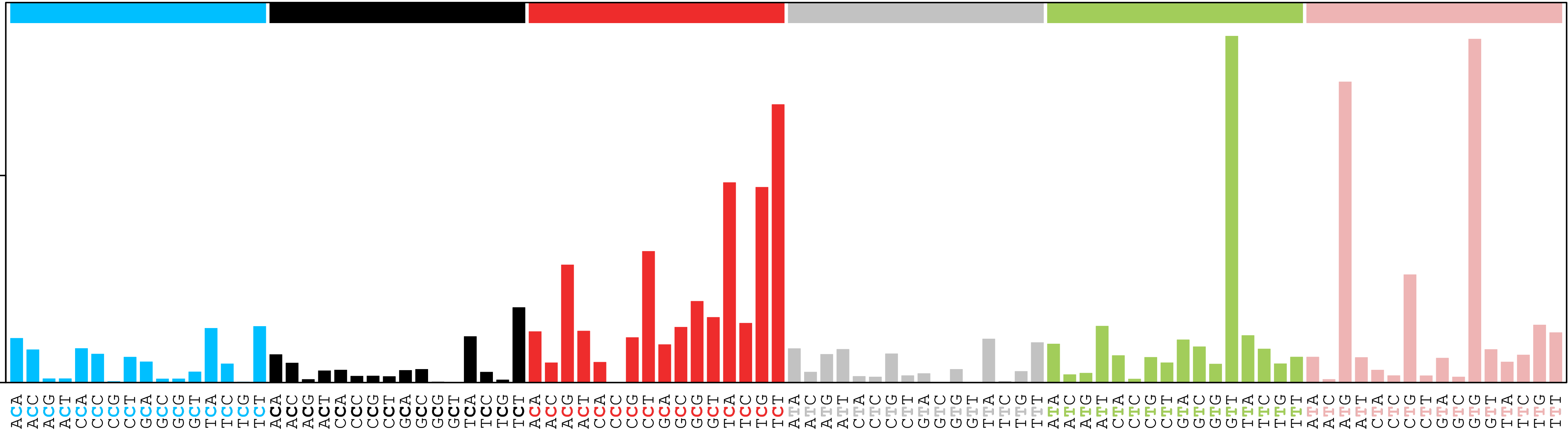
$T > C$

T>G

# Mutation probability

0.05

0.00







# SBS102

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

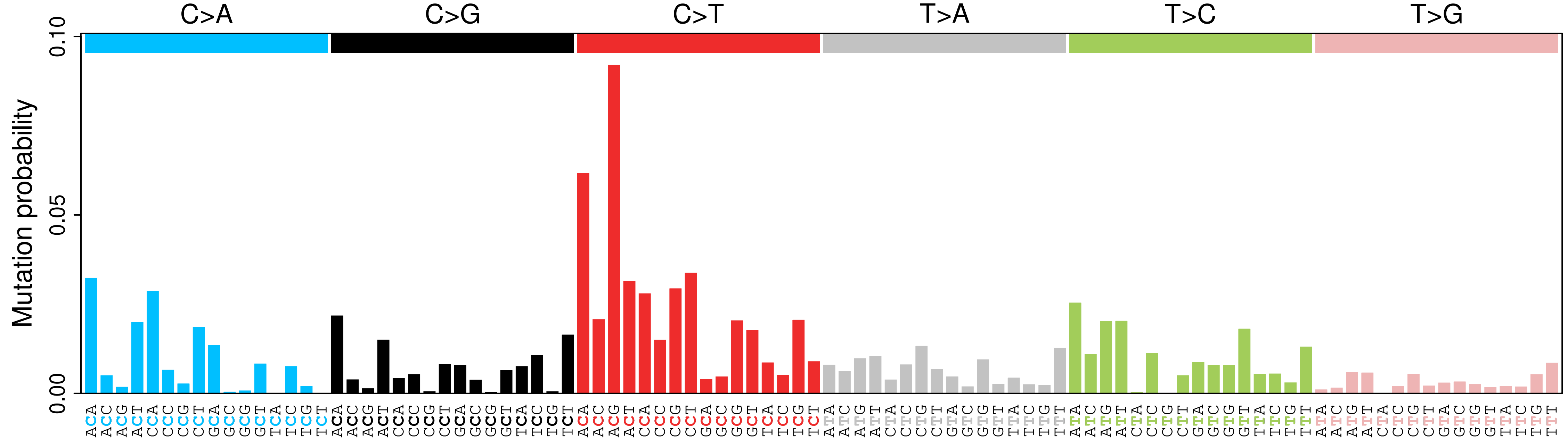
0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT



# SBS103



# SBS104

$C > A$

C > G

$C > T$

**T > A**

$$T > C$$

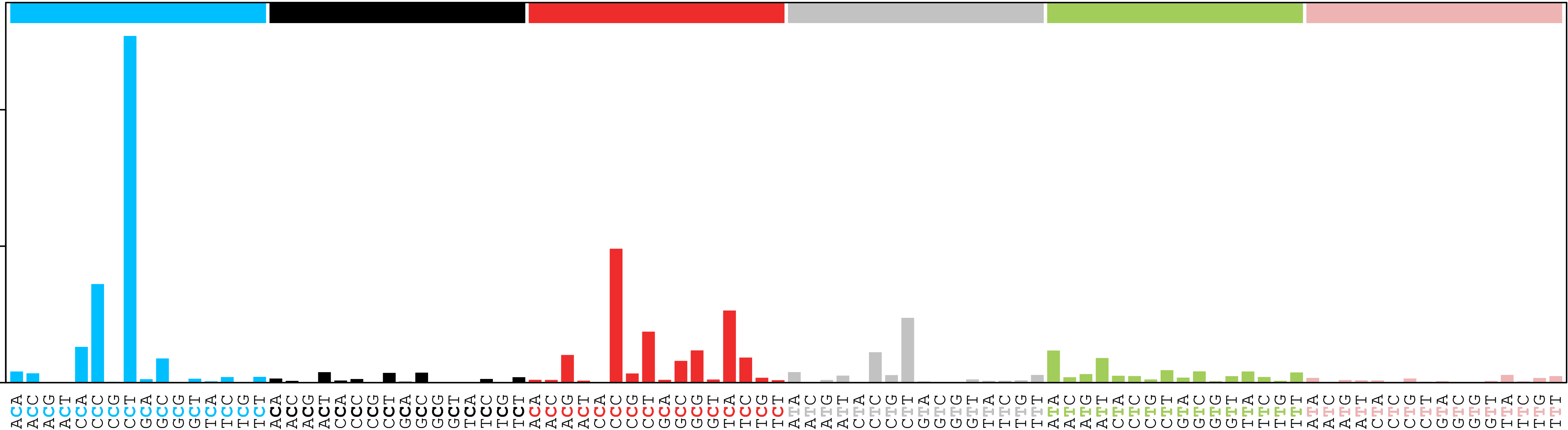
**T>G**

# Mutation probability

## 0.2

0.1

0.0









# SBS107

**C > A**

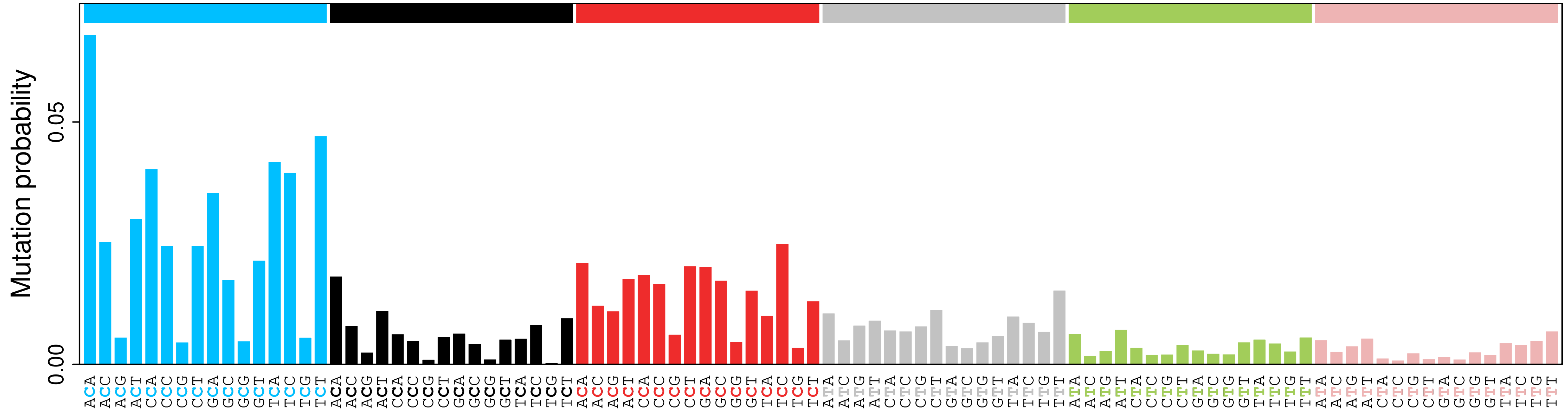
C > G

$C > T$

**T > A**

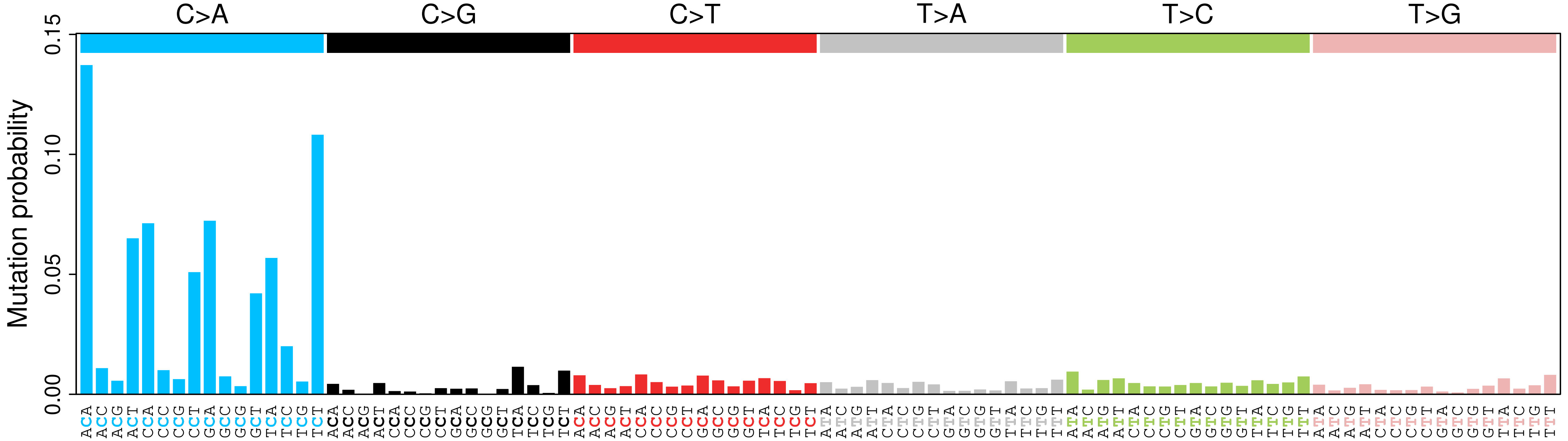
$$T > C$$

T > G





# SBS109





# SBS111

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

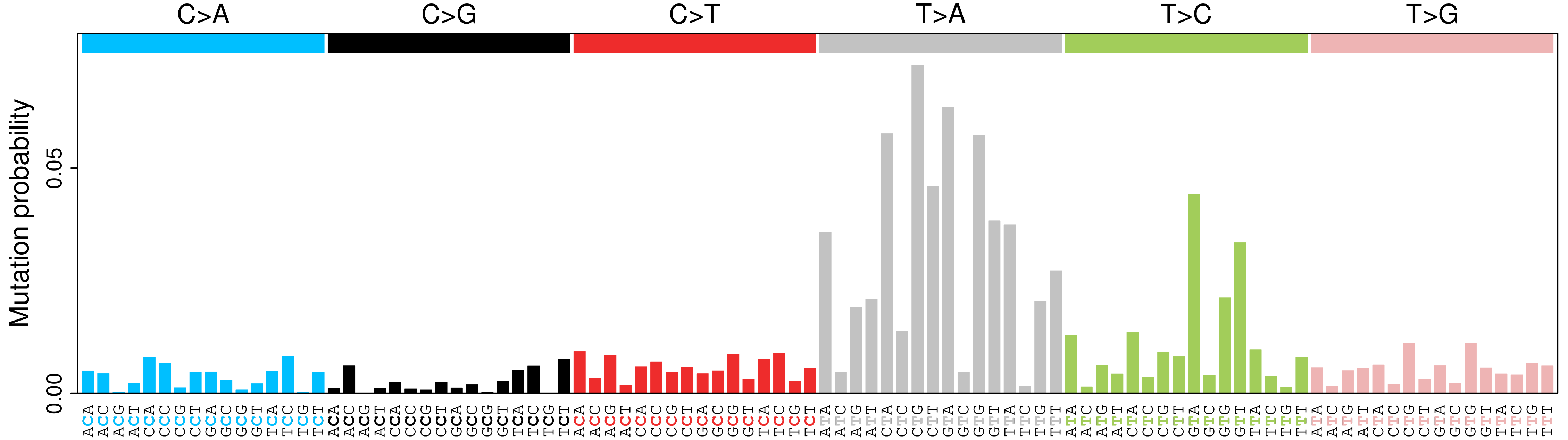
0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GCG GGT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GCG GGT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GCG GGT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT



SBS113





# SBS114

**C > A**

C > G

$C > T$

**T > A**

$T > C$

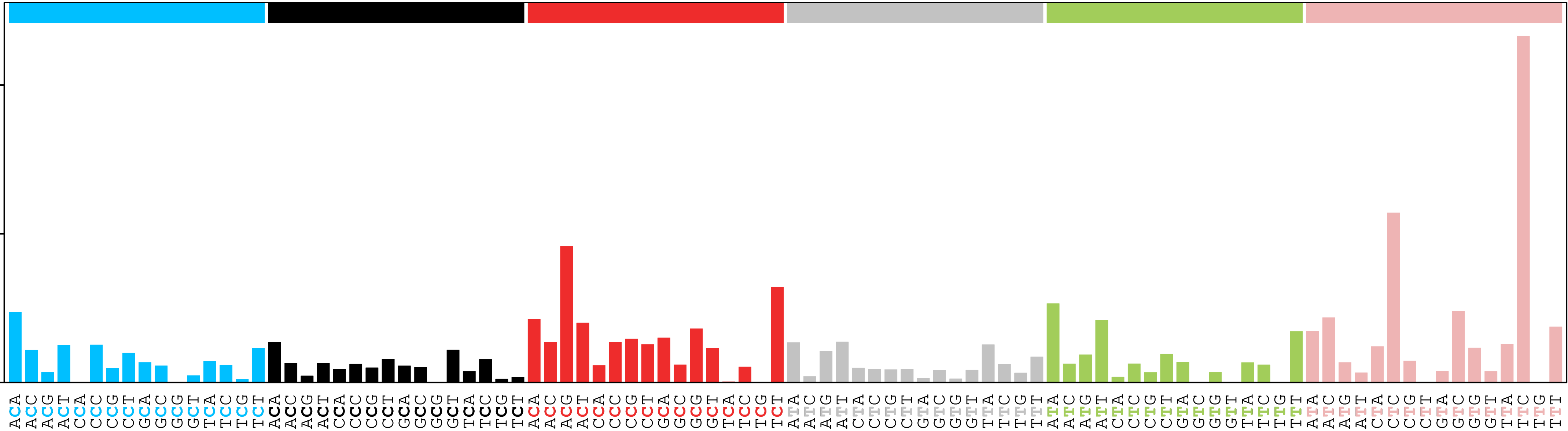
T>G

# Mutation probability

0.10

0.05

0.00





# SBS116



# SBS117

**C > A**

C>G

$$C > T$$

**T > A**

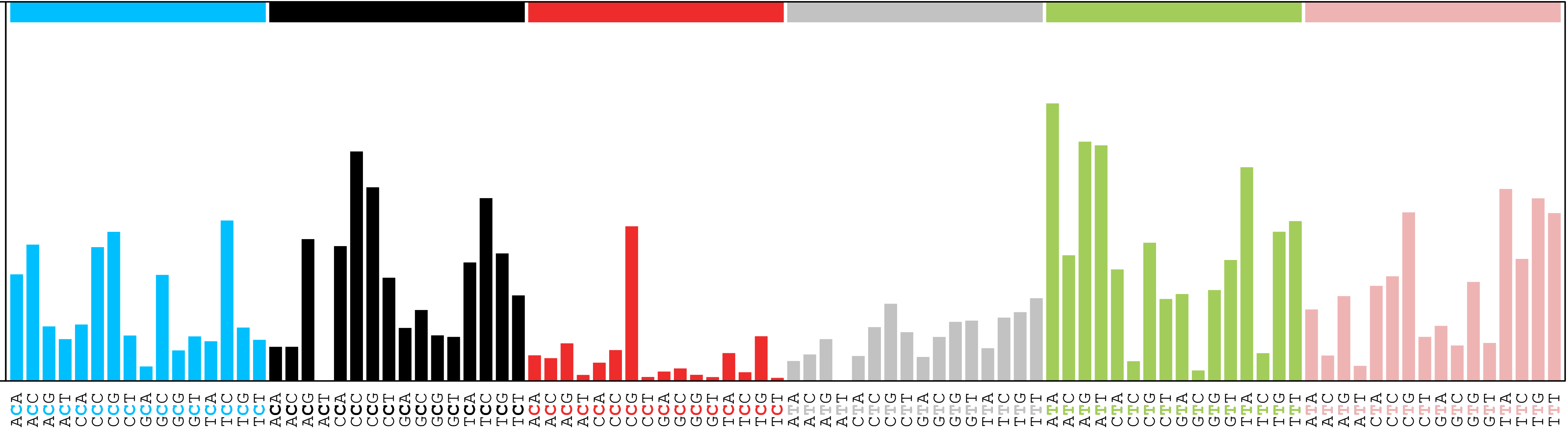
$T > C$

T > G

0.05

# Mutation probability

0.00





# SBS119

**C > A**

C > G

$$C > T$$

**T > A**

$T > C$

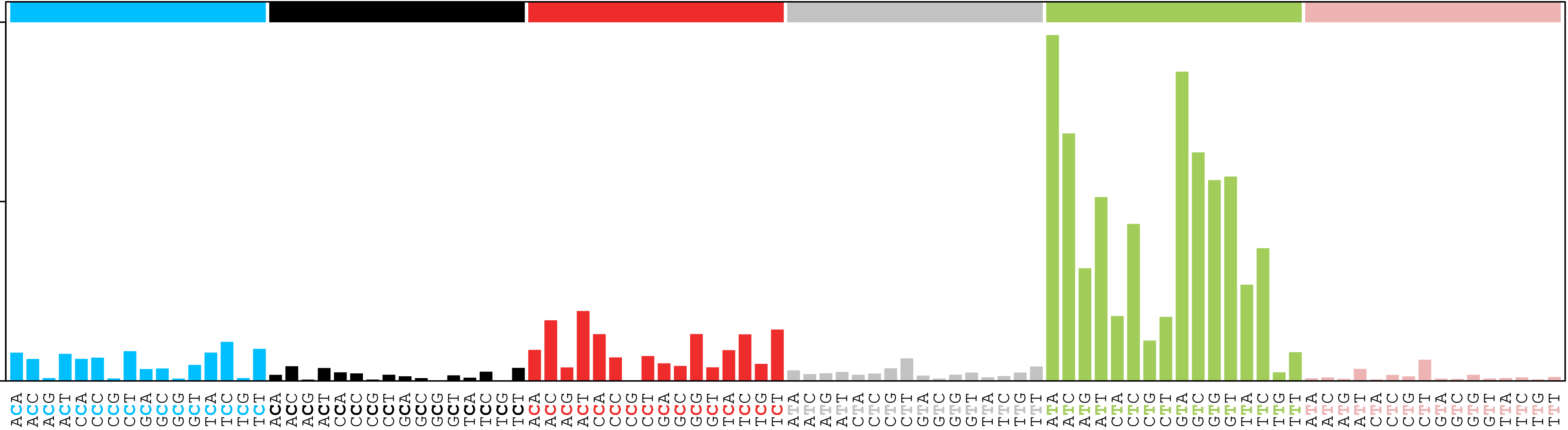
$T > G$

# Mutation probability

0.10

0.05

0.00





# SBS121

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.15

0.10

0.05

0.00

ACA ACC AGT ACT CCA CCC CGG GGT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CGG CCT GCA GCC GCG GGT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT



# SBS122

$C > A$

C > G

$$C > T$$

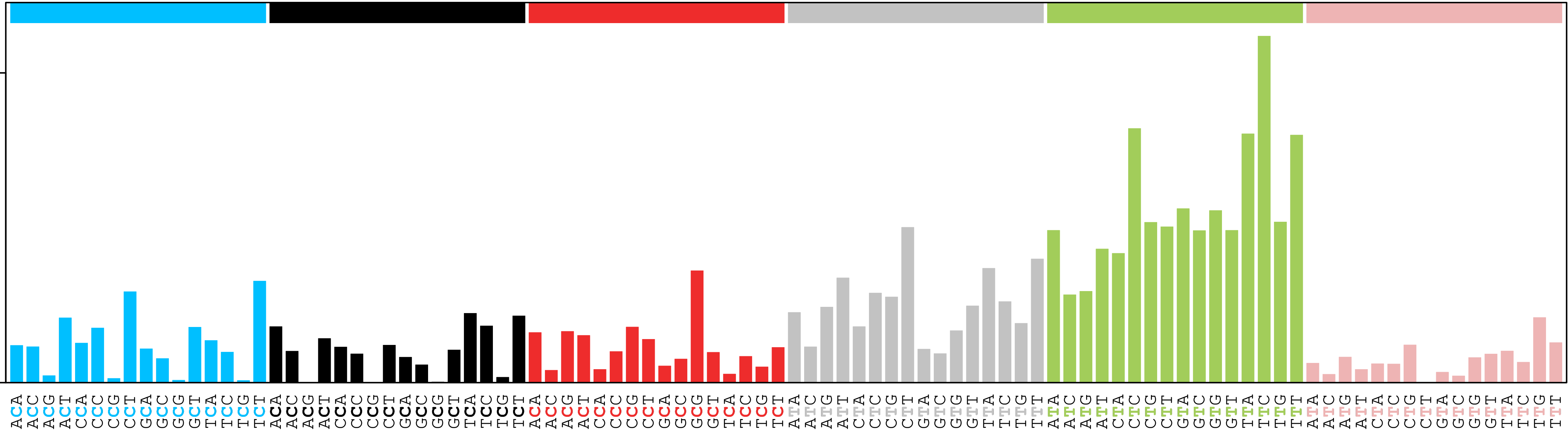
$T > A$

$T > C$

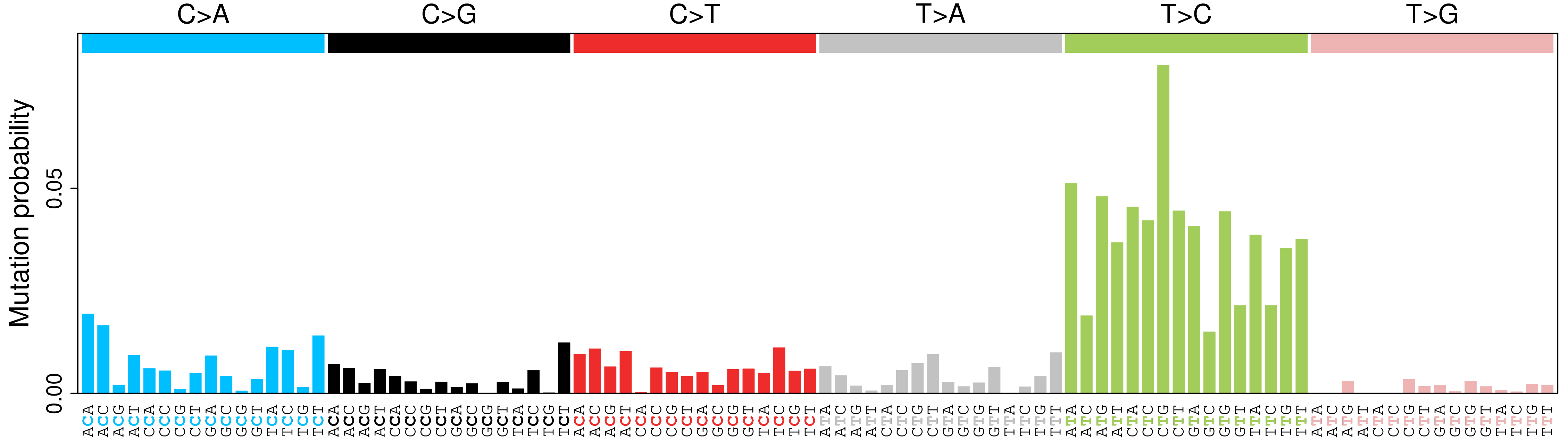
$T > G$

0.05

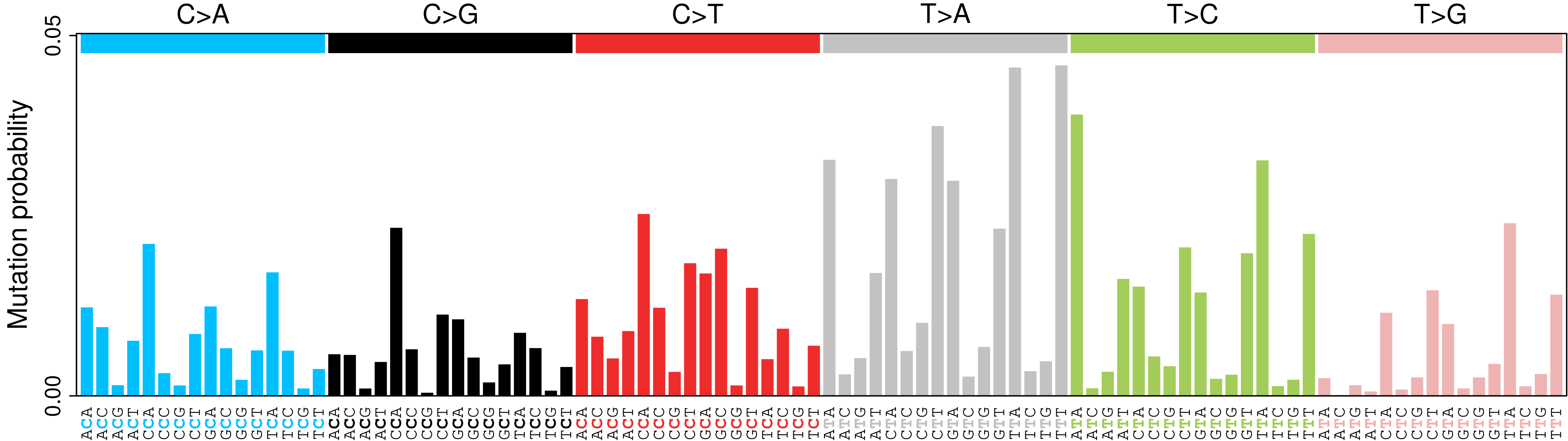
0.00



SBS123



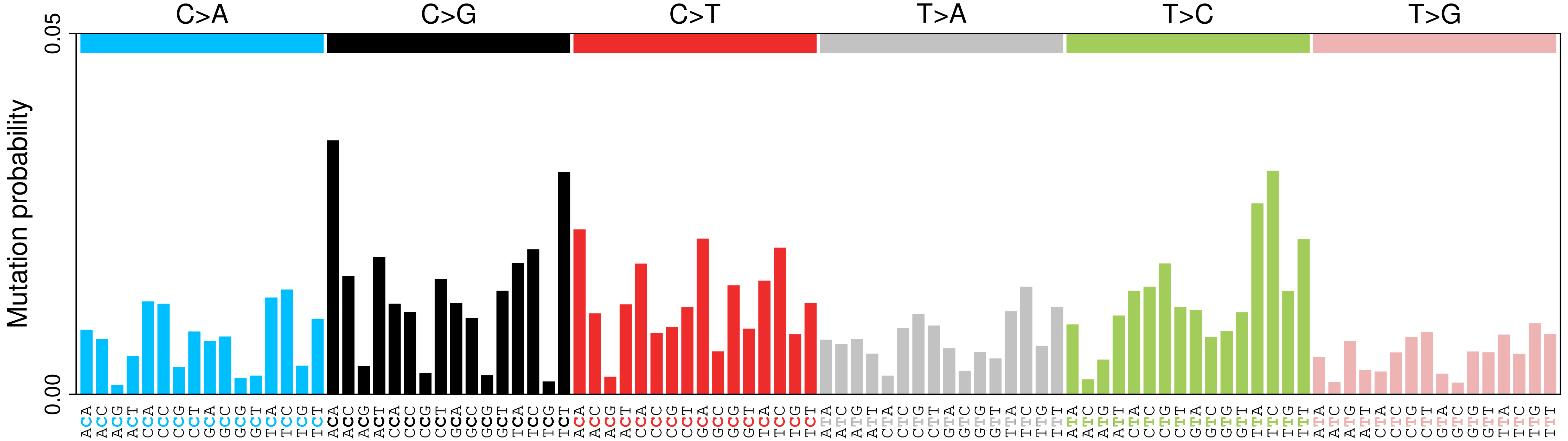
# SBS124



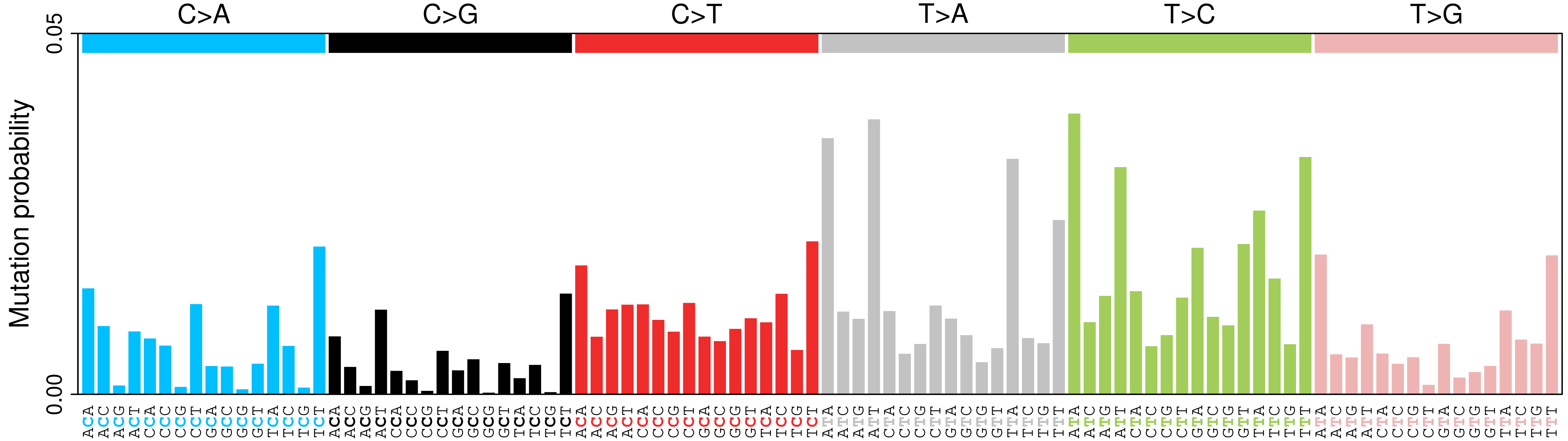
# SBS125



# SBS126



# SBS127













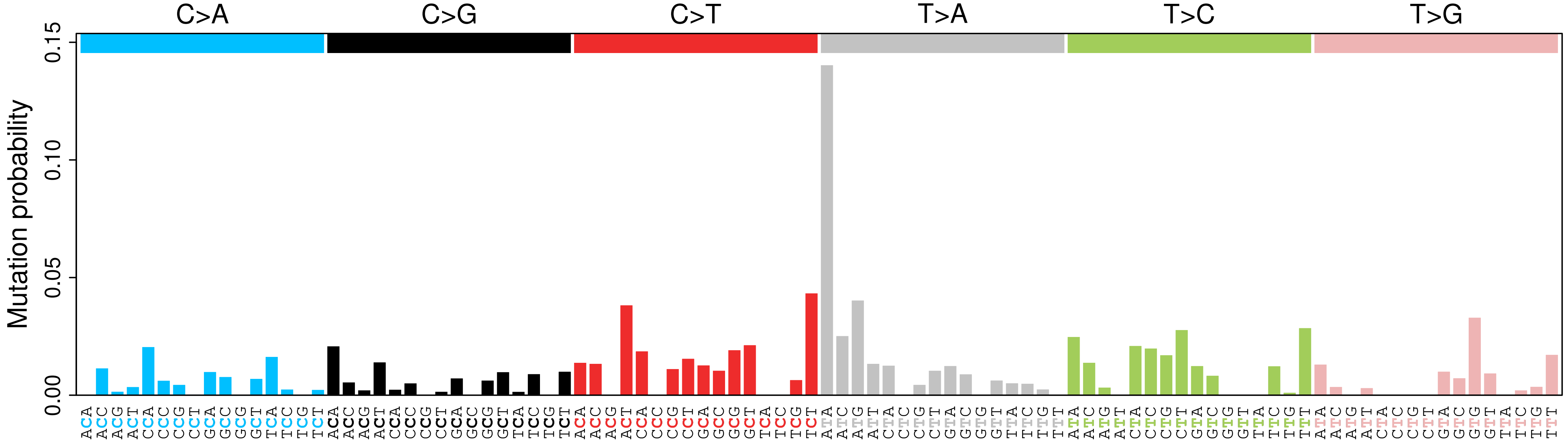
SBS132



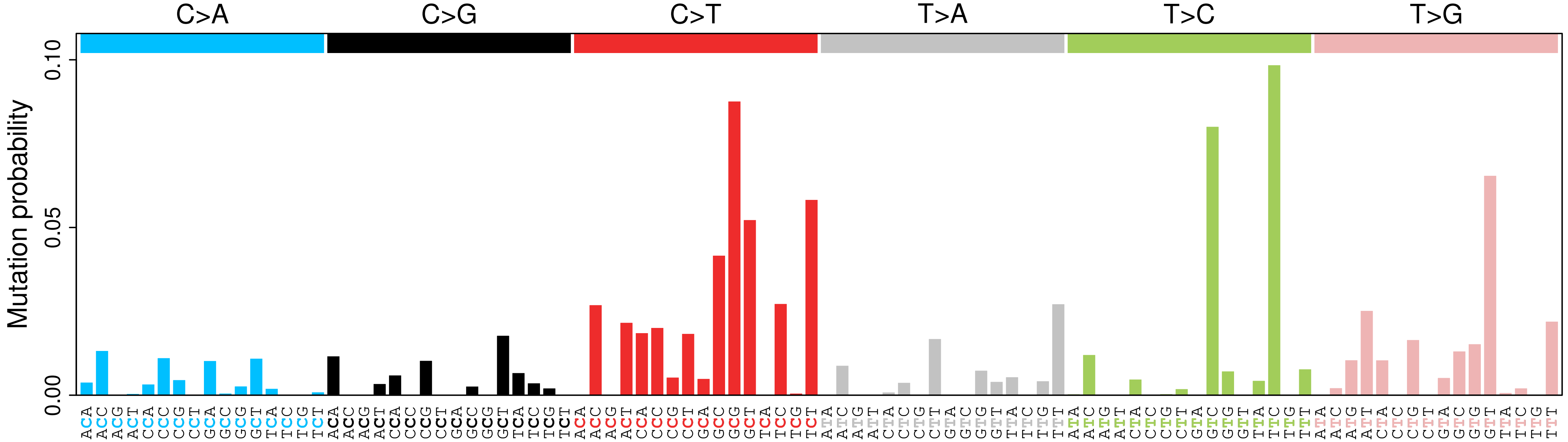




# SBS135



# SBS136



# SBS137

**C > A**

C > G

$C > T$

**T > A**

$$T > C$$

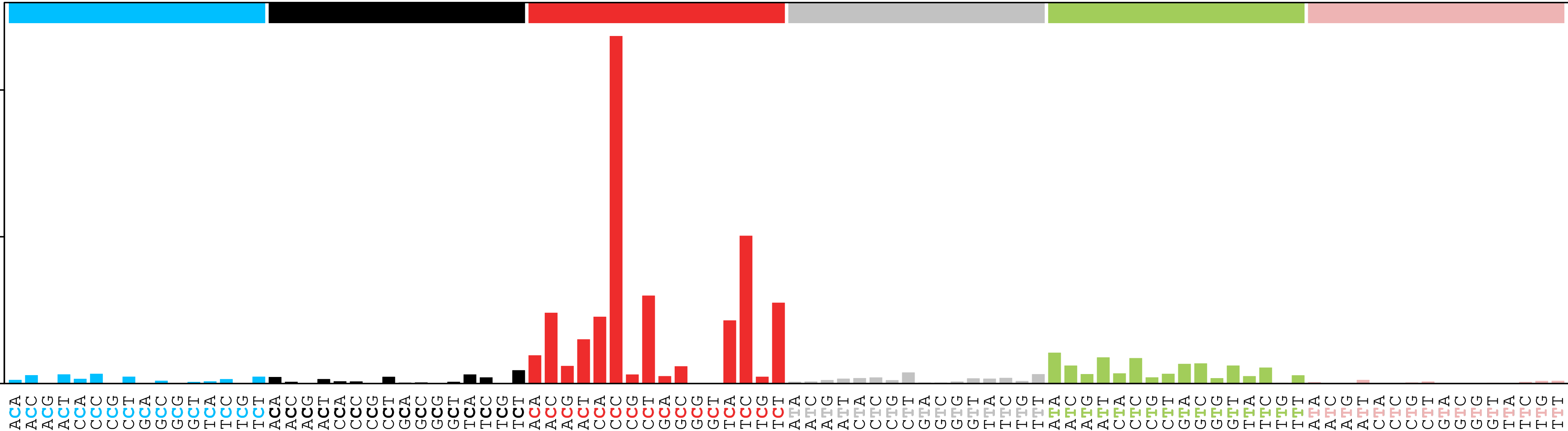
T>G

# Mutation probability

0.2

o

0.0









# SBS140

**C > A**

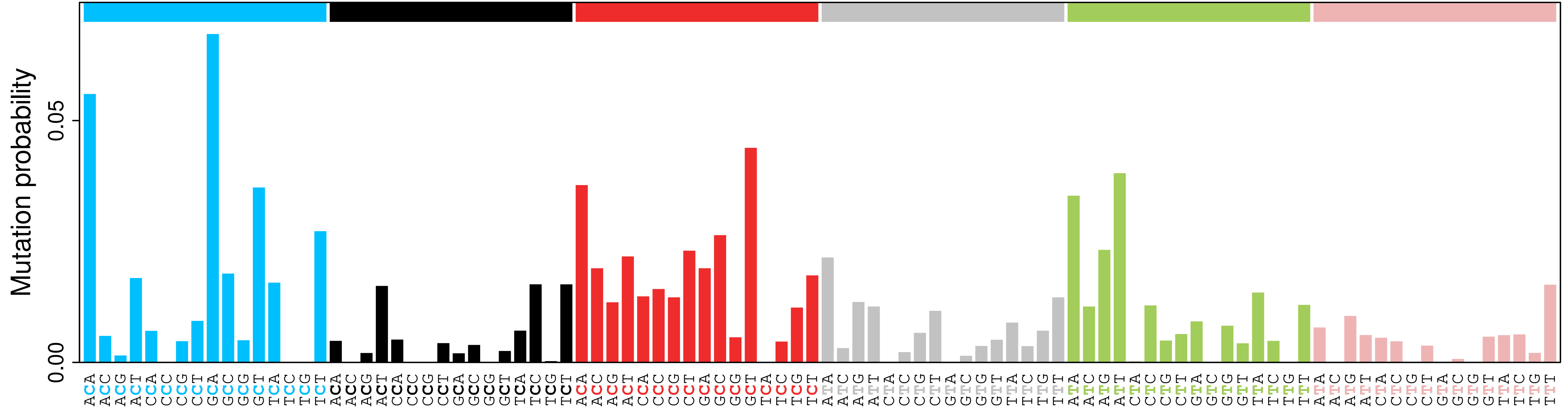
C > G

$$C > T$$

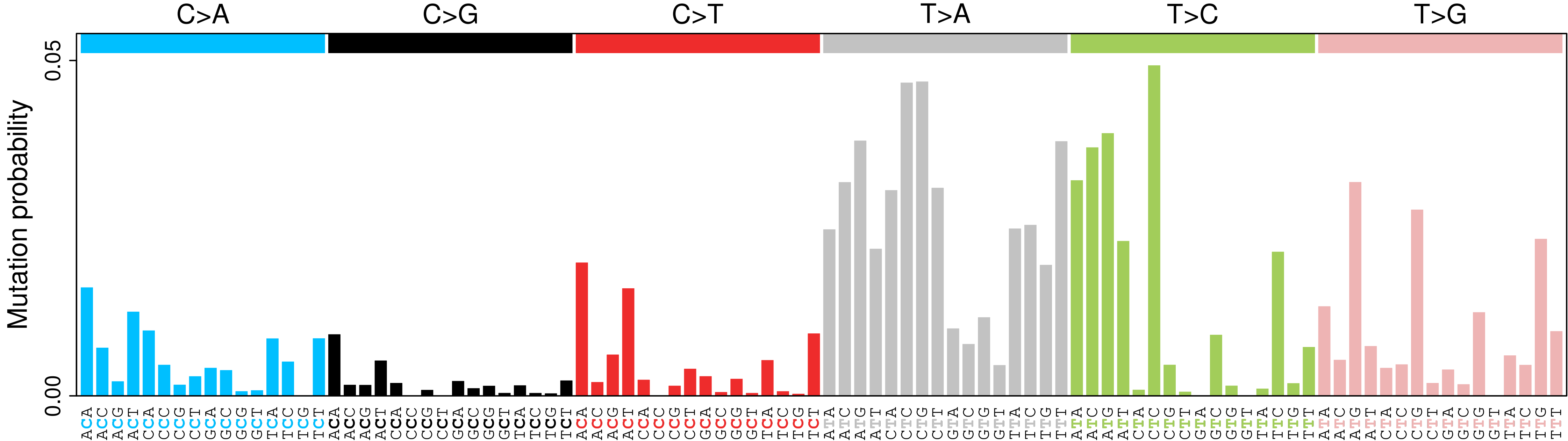
**T > A**

$T > C$

T>G



# SBS141



# SBS142

C>A

C>G

C>T

T>A

T>C

T>G

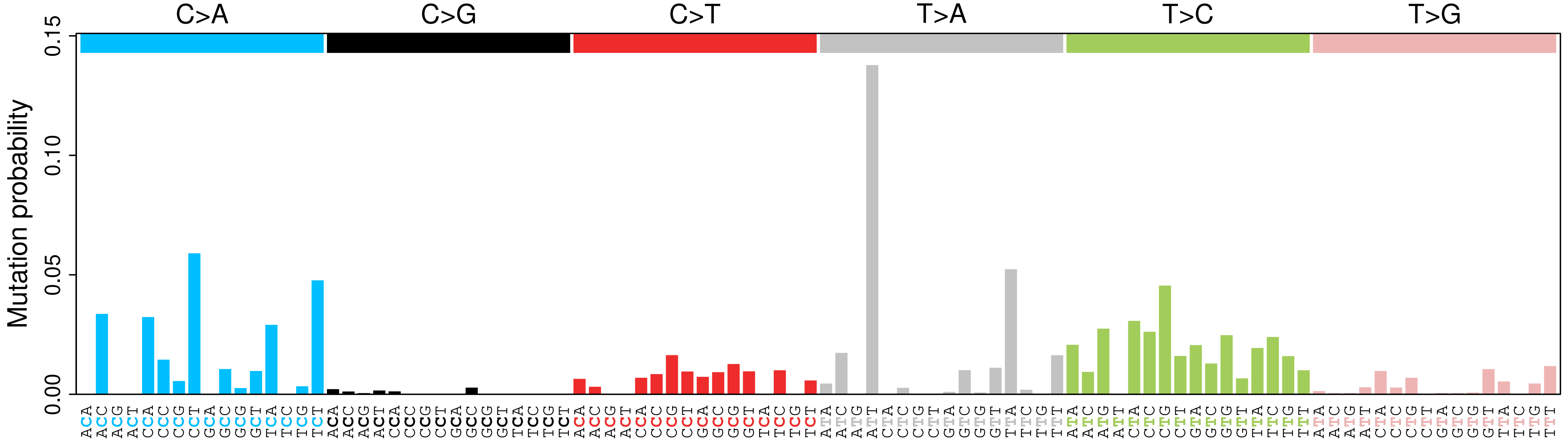
Mutation probability

0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGG GGT TCA TCC TCG TCT TTA TAC TGC TGG TGT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT TTA TAC TGC TGG TGT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT TTA TAC TGC TGG TGT TTA TTC TTG TTT

# SBS143



# SBS144

$C > A$

C > G

C>T

**T > A**

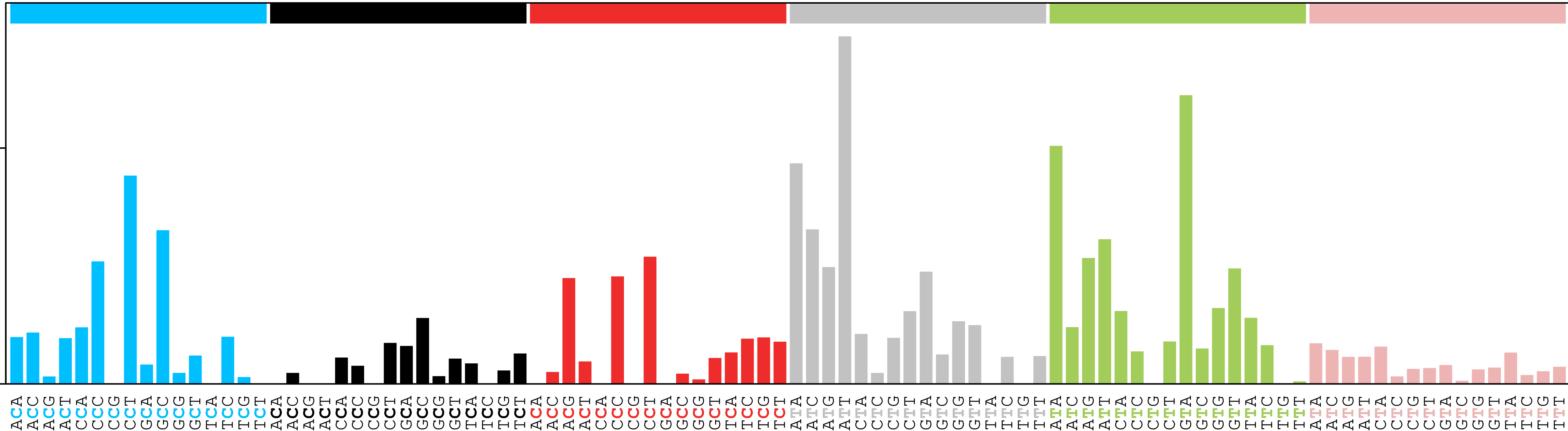
$T > C$

T>G

# Mutation probability

0.05

0.00

















# SBS151

$C > A$

C > G

$C > T$

**T>A**

 $T > C$ 

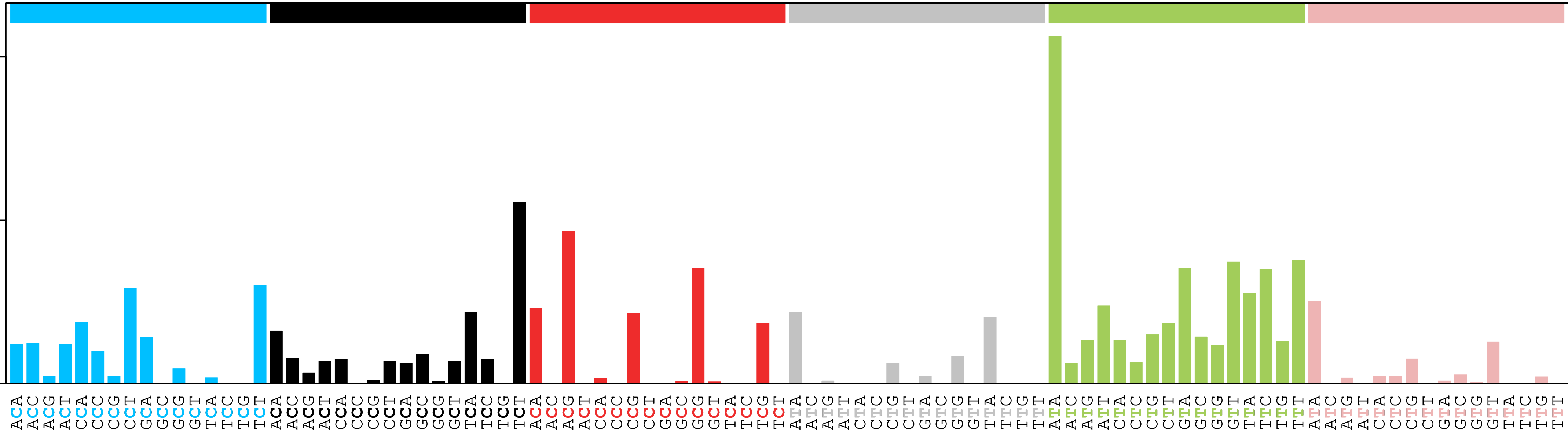
T>G

# Mutation probability

0.10

0.05

0.00





# SBS153

C>A

C>G

C>T

T>A

T>C

T>G

Mutation probability

0.05

0.00

ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ACA ACC ACG ACT CCA CCC CCG CCT GCA GCC GGT GCT TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT



# SBS154





# SBS156

C>A

C>G

C>T

T>A

T>C

T>G

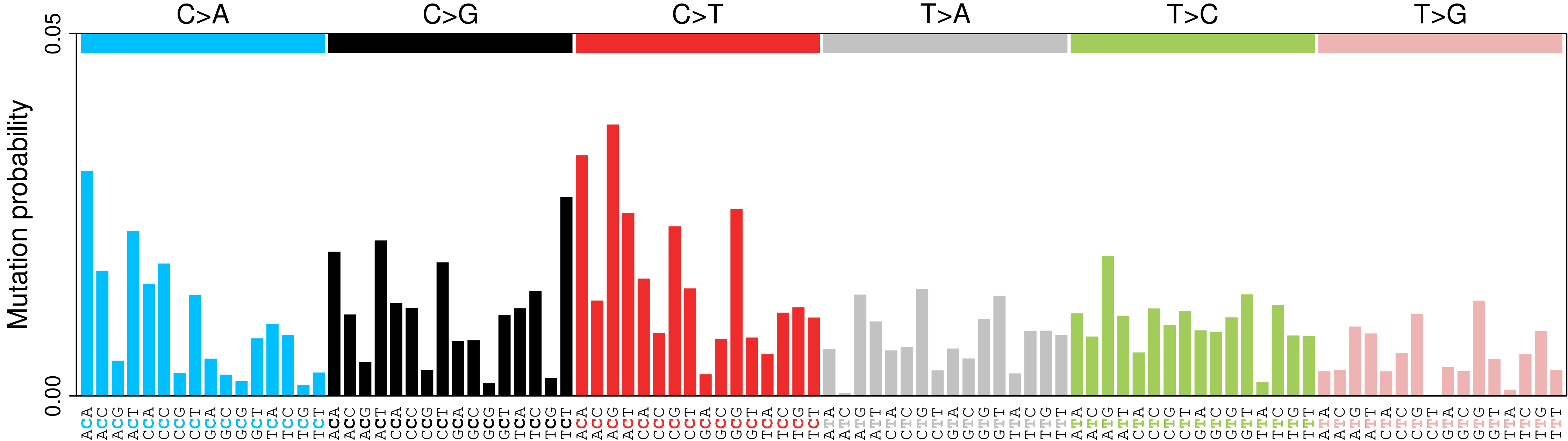
Mutation probability

0.05

0.00

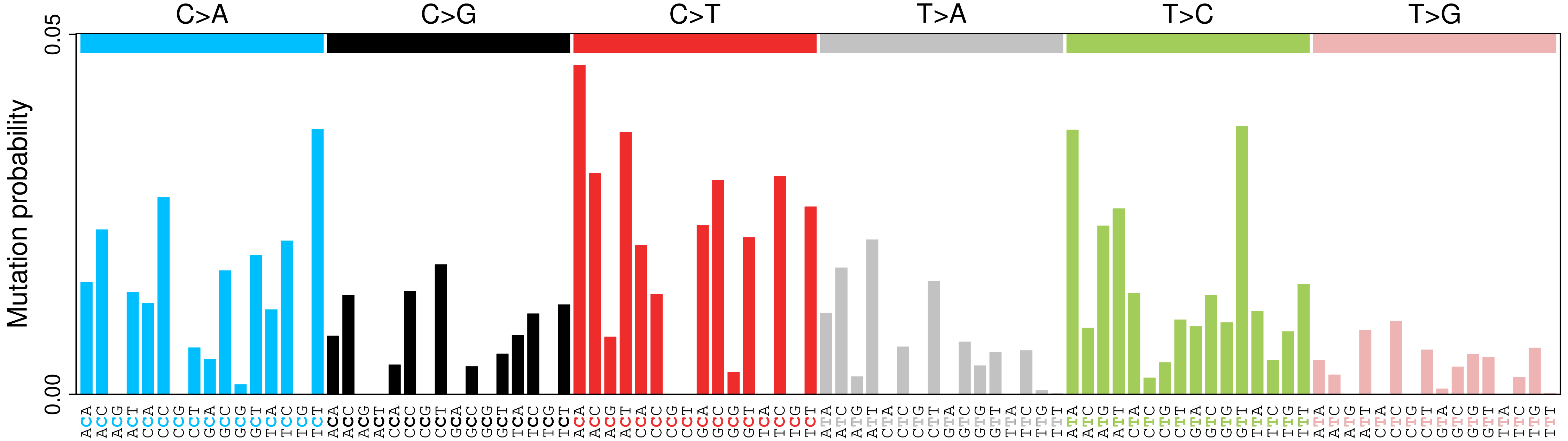
ACA ACC AGC ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC AGC ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ACA ACC AGC ACT CCA CCC CCG CCT GCA GCC GGT GTC TCA TCC TCG TCT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT ATA ATC ATG ATT CTA CTC CTG CTT GTA GTC GTG GTT TTA TTC TTG TTT

# SBS157

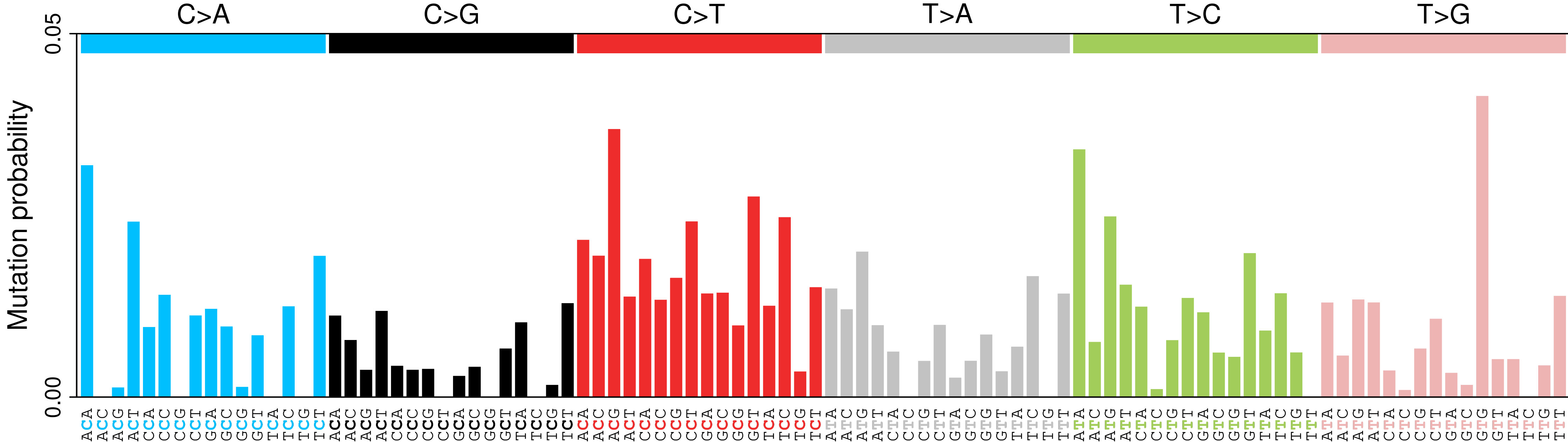




# SBS159



# SBS160



# SBS161

$C > A$

C > G

$C > T$

**T > A**

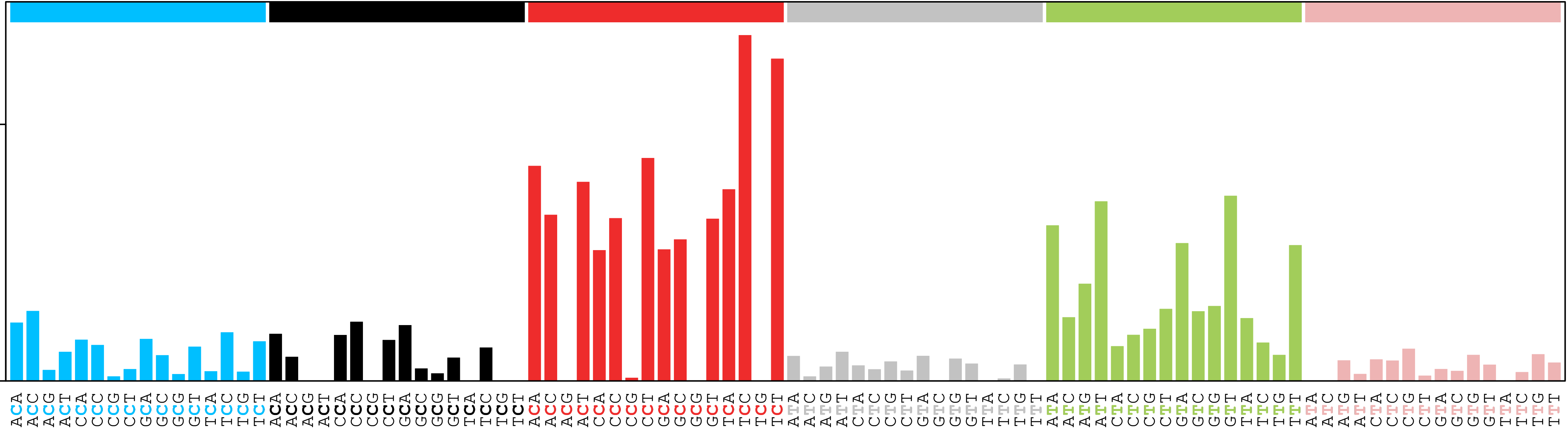
$T > C$

T>G

# Mutation probability

0.05

0.00





# SBS162

**C > A**

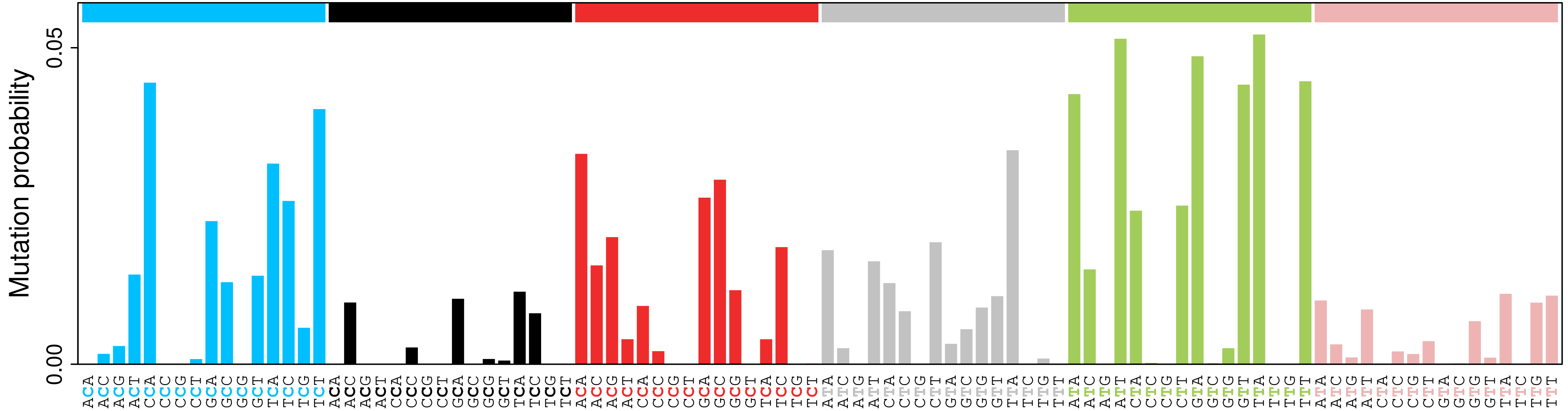
C > G

$C > T$

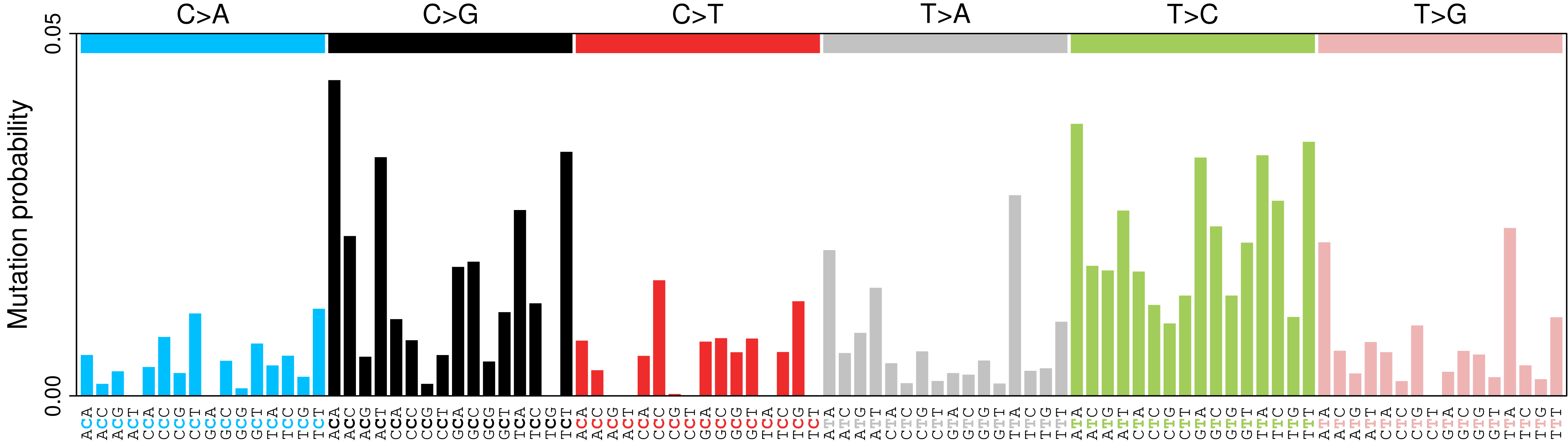
**T > A**

$T > C$

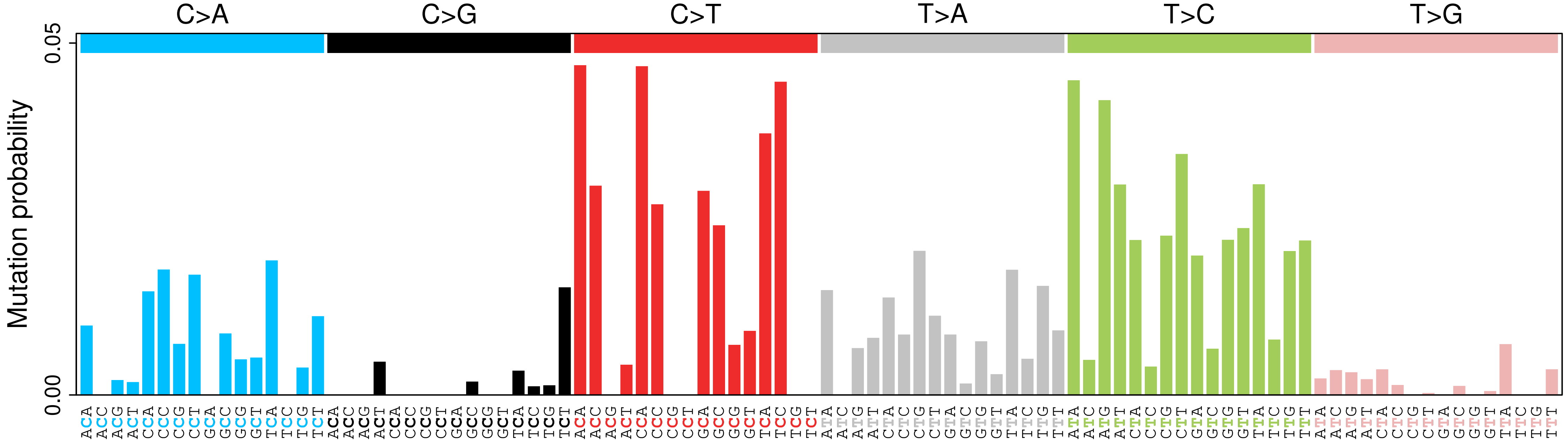
T>G



# SBS163



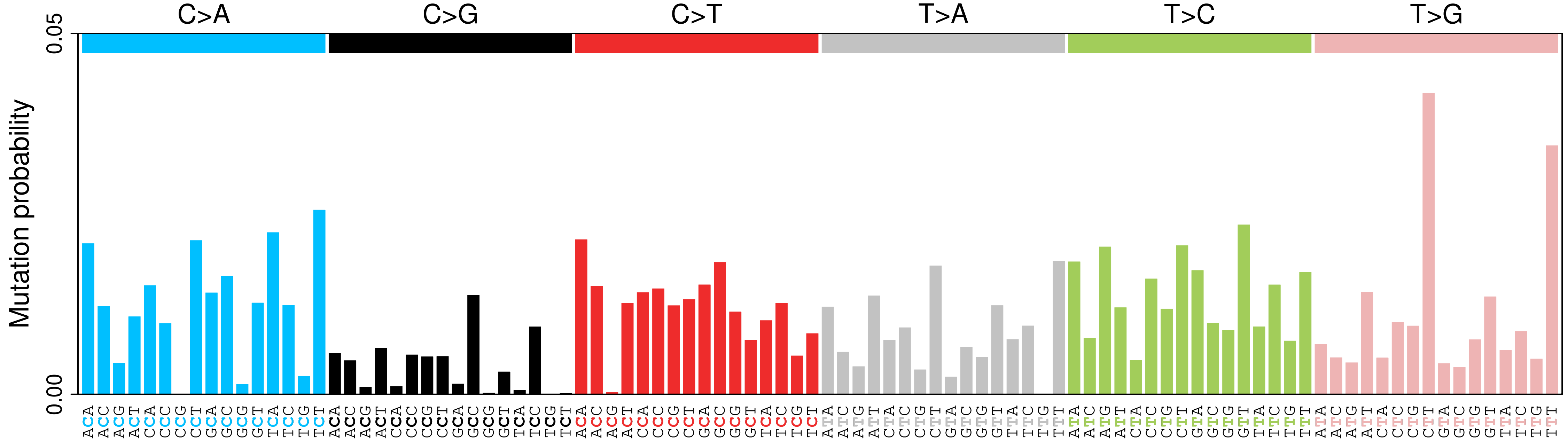
# SBS164







# SBS167



# SBS168

**C > A**

C > G

$C > T$

**T > A**

$T > C$

T>G

# Mutation probability

0.05

0.00



