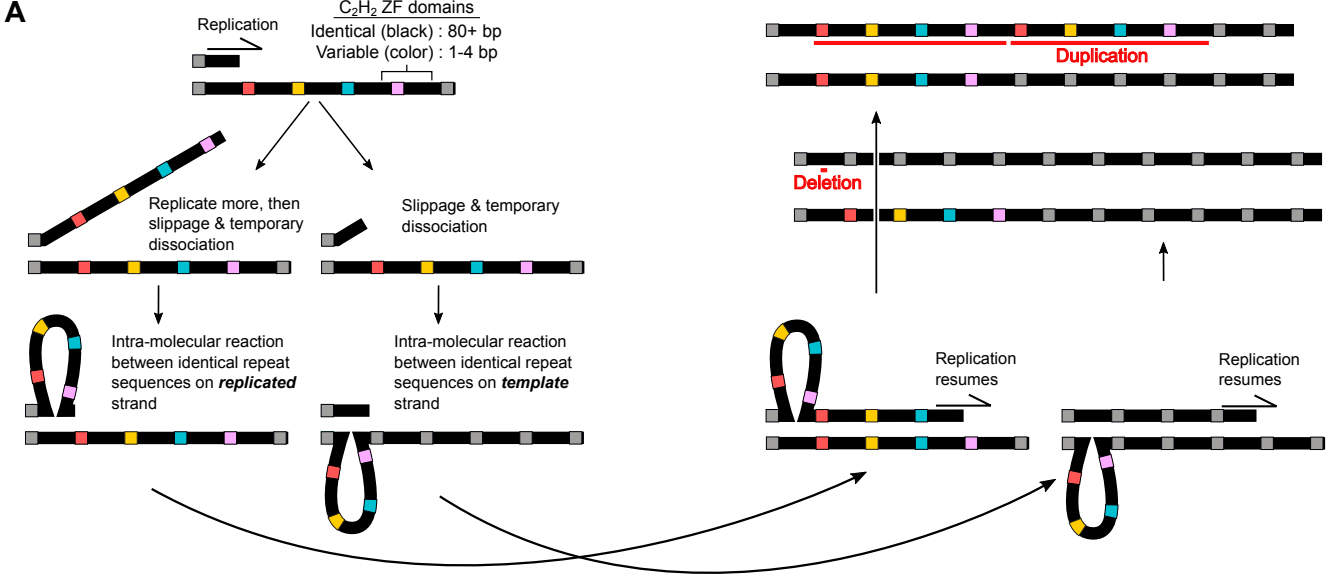

B Template switching algorithm to derive $Prdm9_N$ from $Prdm9_A$

$Prdm9_A$ (parent/template1) :A:B:C:D:D:E:C:F:G:H:**F:I**:J
$Prdm9_A$ (parent/template2) :A:B:C:D:D:E:C:F:G:H:**F:I**:J

$Prdm9_N$ (progeny/query) :A:B:C:D:D:E:C:F:G:H**|d**:J

ZF	CIGAR String
:F	15M**A**55M**T**12M
:I	15M**C**55M**C**12M
|d	15M**A**55M**C**12M

1. Find longest match between the LHS of the query and template 1

Maximal 5' match

$Prdm9_A$ (template1) : A B C D D E C F G H **F I** J
$Prdm9_N$ (progeny/query): A B C D D E C F G H **d** J

2. Truncate query allele

Truncated query: **d** J

3. Find the longest match between the LHS of truncated query allele and template 2 (does not have to be on the LHS of template)

$Prdm9_A$ (template2) : A B C D D E C F G H **F I** J
Truncated query : **d** J

4. END because truncated query matches RHS

Mono-parental:
- Replicate 10.5 ZFs
- (TS1): Skip 1 ZF
- Replicate 1.5 ZFs

Schema:
A-B-C-D-D-E-C-F-G-H-**d**-J
A-B-C-D-D-E-C-F-G-H-J

Bi-parental:
- Replicate 10.5 ZFs
- TS to template 2
- Replicate 1.5 ZFs

Schema:
A-B-C-D-D-E-C-F-G-H-F-I-J
A-B-C-D-D-E-C-F-G-H-F-I-J

One template switch can create *$Prdm9_N$* from *$Prdm9_A$*

C Template switching algorithm to derive $Prdm9_{L4}$ from $Prdm9_C$

$Prdm9_C$ (parent/template1) :A:B:C:D:D:C:C:F:K:H:L:H:I:J
$Prdm9_C$ (parent/template2) :A:B:C:D:D:C:C:F:K:H:L:H:I:J

$Prdm9_{L4}$ (progeny/query) :A:B:C:D:D:C:C**:C:D:D:C**:F:K:H:L:H:I:J

1. Find longest match between the LHS of the query and template 1

Maximal 5' match

$Prdm9_C$ (parent/template1) A B C D D C C F K H L H I J
$Prdm9_{L4}$ (progeny/query) A B C D D C C **C D D C** F K H L H I J

2a. Truncate query allele

Truncated query: **C D D C** F K H L H I J

3a. Find the longest match between the LHS of the truncated query and template 2

$Prdm9_C$ (parent/template2):A B C D D C C F K H L H I J
Truncated query: **C D D C** F K H L H I J

2b. Truncate query allele

Truncated query: F K H L H I J

3b. Find the longest match between the LHS of the truncated query and template 1

$Prdm9_C$ (parent/template1):A B C D D C C F K H L H I J
Truncated query: F K H L H I J

4. END because truncated query matches RHS

Mono-parental:
- Replicate 7 ZFs
- (TS 1): Replicate 4 ZFs
- (TS 2): Skip 1 ZF
- Replicate 7 ZFs

Schema:
A-B-**C-D-D-C**-F-K-H-L-H-I-J
A-B-C-D-D-C-F-K-H-L-H-I-J

Bi-parental:
- Replicate 7 ZFs
- TS 1 to template 2 (4 ZFs)
- TS 2 to template 1 (7 ZFs)

Schema:
A-B-**C-D-D-C**-C-F-K-H-L-H-I-J
A-B-**C-D-D-C**-C-F-K-H-L-H-I-J

Two template switches can create *$Prdm9_{L4}$* from *$Prdm9_C$*