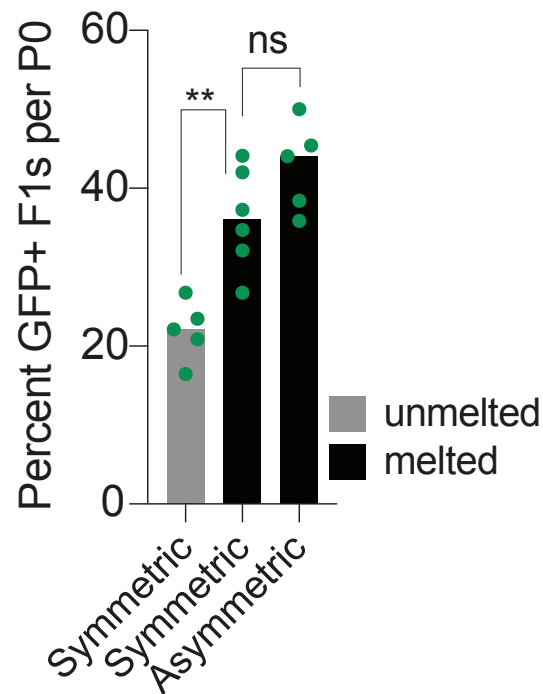# Supplementary Information

Figure S1: Melted dsDNA donors promote homology directed repair. HDR efficiencies at the *glh-1* locus using symmetric (unmelted or melted) and asymmetric donors (n=5 or 6 broods) without *rol-6* injection marker. Each data point (green) represents the percentage of animals expressing GFP among F1s scored per brood. Bars represent median.P-values (**, 0.0087 and ns, 0.1255) were determined by Mann Whitney test (unpaired, non-parametric, two-tailed)
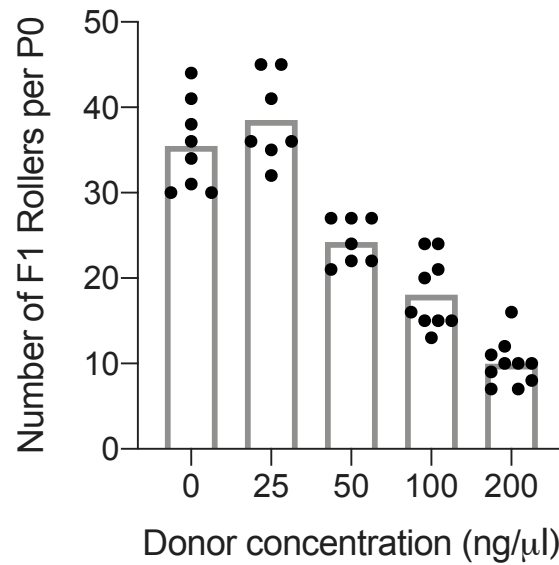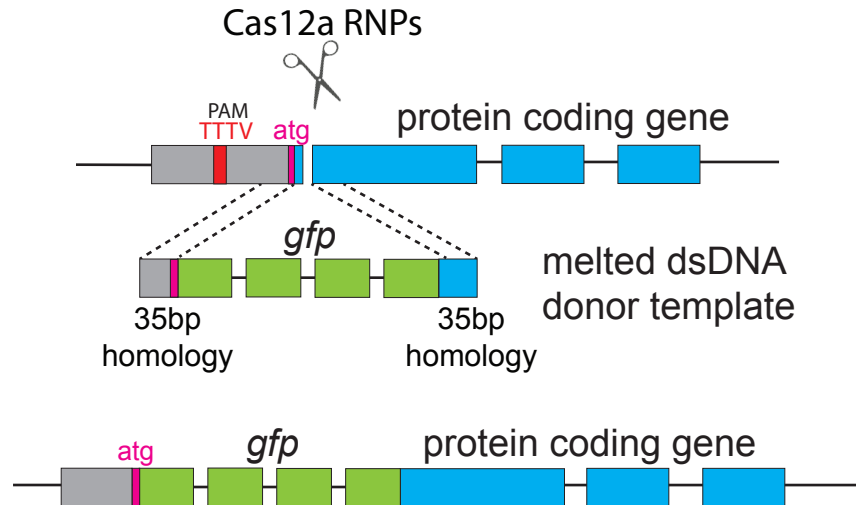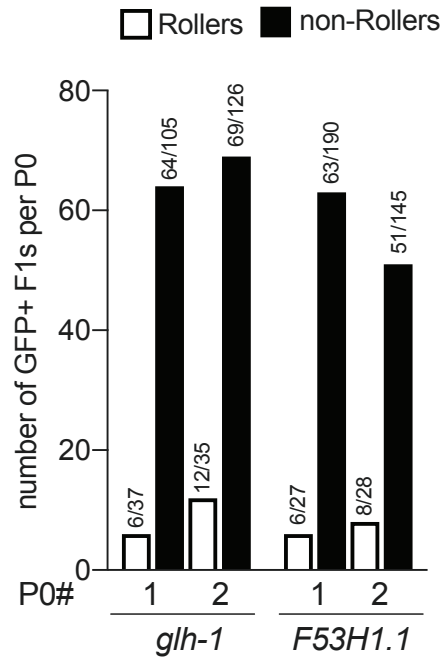
Figure S2. High doses of donor DNA reduce the number of Rollers. Injection mixes contain Prf4::*rol-6(su1006)*, Cas9 protein, crRNA targeting *glh-1* locus and *gfp::glh-1* dsDNA donor with ~35bp homology arms at indicated doses. Each dot represents the number of F1 rollers obtained per P0 animal and the bar represents mean; (n=7 to 10 broods per condition). dsDNA donors were not melted.
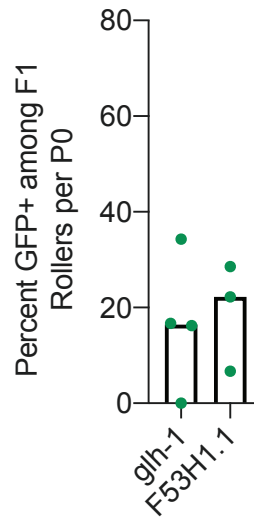
Cas12a based genome editing

A

B

C

D

Figure S3. Precise genome editing using Cas12a nuclease and melted dsDNA donors. (**A**) Schematic representation of template dependent editing with Cas12a and melted dsDNA donor to insert *gfp* at the start codon (atg). Protospacer adjacent motif (PAM) for Cas12a system is TTTV, where V is A, C or G. HDR efficiencies at *glh-1* and *F53H1.1* loci are plotted as (**B**) number of GFP+ F1 animals among two representative broods, (**C**) percentage of GFP+ animals among F1 Rollers and (**D**) percentage of GFP+ animals among F1 non-Rollers; n= 3 or 4 broods. Number of GFP+ animals over number of animals scored are shown above the bars. Each data point represents the percentage of animals that are GFP+ among F1s scored in each cohort per brood and bars represent the median.

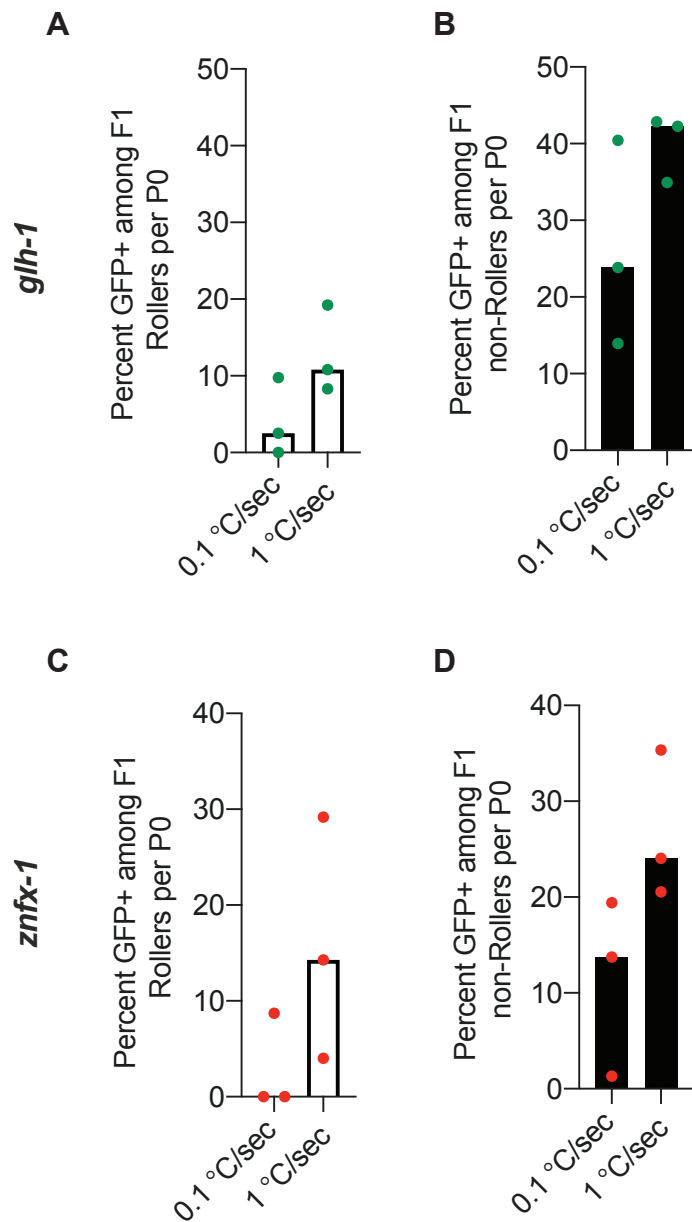**Figure S4. Quickly cooled donors act as better repair templates than slowly cooled donors.** *gfp* (green dots) insertion efficiencies at *glh-1* loci are plotted for (**A**) Rollers and (**B**) non-Rollers using slow (0.1 ºC/sec) and quick (1 ºC/sec) cooled donors as percentage. (**C and D**) *mCherry* (red dots) insertion efficiencies at *znfx-1* locus. Each data point represents an F1 brood and bars represent median. Thermal cycler program for slow cooling: 95 ºC - 2:00 min; 85 ºC - 1:00 min; 75 ºC - 1:00 min, 65 ºC - 1:00 min, 55 ºC - 1:00 min, 45 ºC - 1:00 min, 35 ºC - 1:00 min, 25 ºC - 1:00 min, 4ºC- hold. Ramp down rate: 0.1 ºC/sec. P-value = 0.2 for panels A, B, C and 0.1 for panel D (Mann-witney test, two-tailed). See **File S1** for quick cooling conditions.

Supplemental Table S1: List of *C. elegans* strains

Genotype	Strain Name
F53H1.1(ne4815[gfp::F53H1.1]) IV	WM703
glh-1(ne4816[gfp::glh-1]) I	WM704
csr-1(ne4483[flagx3::linker::tev] IV	WM705
znfx-1(ne4817[mcherry::znfx-1]) II	WM706
hrde-1(ne4818[gfp::hrde-1]) III	WM707
csr-1(ne4819[flagx3::linker::gfp::tev::csr-1]) IV	WM708

Supplemental Table S2: Sequences of crRNAs

ID#	Target locus	Sequence (5′→3′)	Notes
CMG-18	*hrde-1*	CATAATTTTGTCGAGCAAGT	To insert N-terminal tag
CMG-25	*csr-1*	AAGATGTTCAGGGCAAGTCT	To insert N-terminal tag
CMG-33	*Flagx3::linker::tev*	TATAAAGACGATGACGATAA	To insert gfp at csr-1 locus
CMG-34	*glh-1*	TTTTCTGCGAAAATGTCTGA	To insert N-terminal tag
CMG-35	*glh-1*	TGCGAAAATGTCTGATGGTTG	To insert N-terminal tag; (A.s. Cpf1)
CMG-77	*F53H1.1*	TTCCAGTTTTCGATGGGTCG	To insert N-terminal tag
CMG-79	*F53H1.1(A.s. Cpf1)*	CAGTTTTCGATGGGTCGCGGC	To insert N-terminal tag
CMG-88	*znfx-1*	AGGTTTCTGACCATTGAATA	To insert N-terminal tag

Supplemental Table S3: Sequences of oligos

ID#	Sequence (5′→3′)	Notes
cmo-KG475F	ATTTTCTGGAAAAATCTTAA	*gfp::glh-1* donor
cmo-KG476R	TTAGCAGCACTTTCGCTATC	
cmo-KG830F	/SP9/TCGTTTCATCGTTTCTTATTTCAGTCAAACATGTCCGGAGGGAGTGGA	*gfp::hrde-1* donor
cmo-KG831R	/SP9/GTTGGAAGACGAACTTCCCATAATTTTGTCGAGCAAGTCTGCAGAACCTCCGCCACC	
cmo-KG832F	/SP9/ATCCAAAAATCCCCAATTTTTTCCAGTTTTCGATGTCCGGAGGGAGTGGA	*gfp::F53H1.1* donor
cmo-KG833R	/SP9/ACGCTTTCGTTTGTGCTCTTTGTGCTCGCCGCGACCAGAACCTCCGCCACC	
cmo-T1193F	CTTGTTTCAGACCAATTCGCCAACCGTATTCAATGGTCTCAAAGGGTGAAGAAGA	*mCherry::znfx-1* donor
cmo-T1194R	GGCGGCGGGAGCCCTGGGGGGGCGAGGTTTCTGACCTTATACAATTCATCCATGC	
cmo17648	AATCTCAATCAGGACGGTAAAG	*hrde-1* indel detection
cmo17649	GAACTCCTAGGCATAATGTTGA	
cmo-JG55F	ACATAAAACGATAAATCGGC	*F53H1.1* indel detection
cmo-JG56R	TTCCGTGACTCTTCCATTTC	
cmo-KG825R	CGCCGTTTTACTCTCTTT	
cmo17659	CGATTGGAAGTAGAGGTTCT	*gfp::csr-1 donor*
cmo17660	ATCATGATATTGACTATAAA	
cmd-25	gaactatactttttcaggacttaactctgacatgGATTACAAAGACCATGATGGTGACTATAAGGATCATGATATTGACTATAAAGACGATGACGATAAGGGTGGCGGAGAGAACCTCTACTTCCAATCGaaCcaAaaAcaGaaCccTagGctAgcActAaacatcttcgggcttgagctctctgagcgaacgat	ssODN donor to knock-in flagx3::linker::tev at *csr-1* locus