

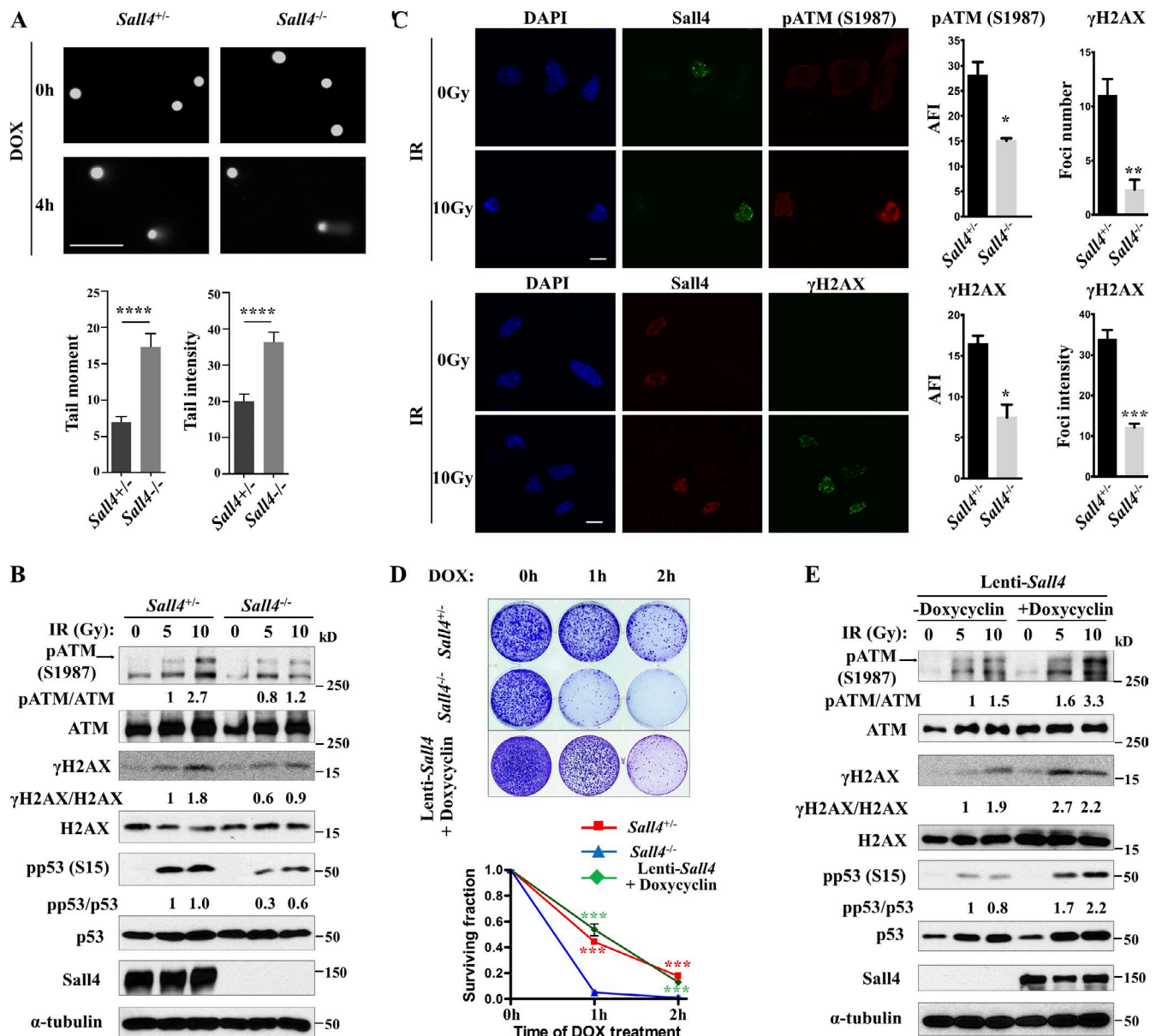
Xiong et al., <http://www.jcb.org/cgi/content/full/jcb.201408106/DC1>

Figure S1. *Sall4*<sup>-/-</sup> ESCs are hypersensitive to IR and impaired in ATM autophosphorylation and activation. (A) A Comet assay on *Sall4*<sup>+/-</sup> and *Sall4*<sup>-/-</sup> ESCs. \*\*\*\*,  $P < 0.0001$  by  $t$  test. Bar, 200  $\mu$ m. (B) Phosphorylated and total protein levels of ATM, p53, and H2AX in *Sall4*<sup>+/-</sup> and *Sall4*<sup>-/-</sup> ESCs after 5 Gy IR. (C) *Sall4*<sup>+/-</sup> and *Sall4*<sup>-/-</sup> ESCs were mixed and examined for foci formation of Sall4, pATM, or  $\gamma$ -H2AX after IR. DNA is counterstained with DAPI (blue). Bar, 10  $\mu$ m. Graphs show the change of average fluorescence intensity (AFI) determined by dividing the overall mean fluorescence intensity by the area of the cell, and values are means  $\pm$  SEM. \*,  $P < 0.05$ ; \*\*,  $P < 0.01$ ; \*\*\*,  $P < 0.001$  throughout the figure. (D) Inducible expression of Sall4 in *Sall4*<sup>-/-</sup> ESCs rescued the hypersensitivity of *Sall4*<sup>-/-</sup> ESCs to DOX. The values of the surviving fraction are means  $\pm$  SEM. \*\*\*,  $P < 0.001$  by  $t$  test. (E) Inducible expression of Sall4 in *Sall4*<sup>-/-</sup> ESCs rescues the activation of ATM and p53 after IR.

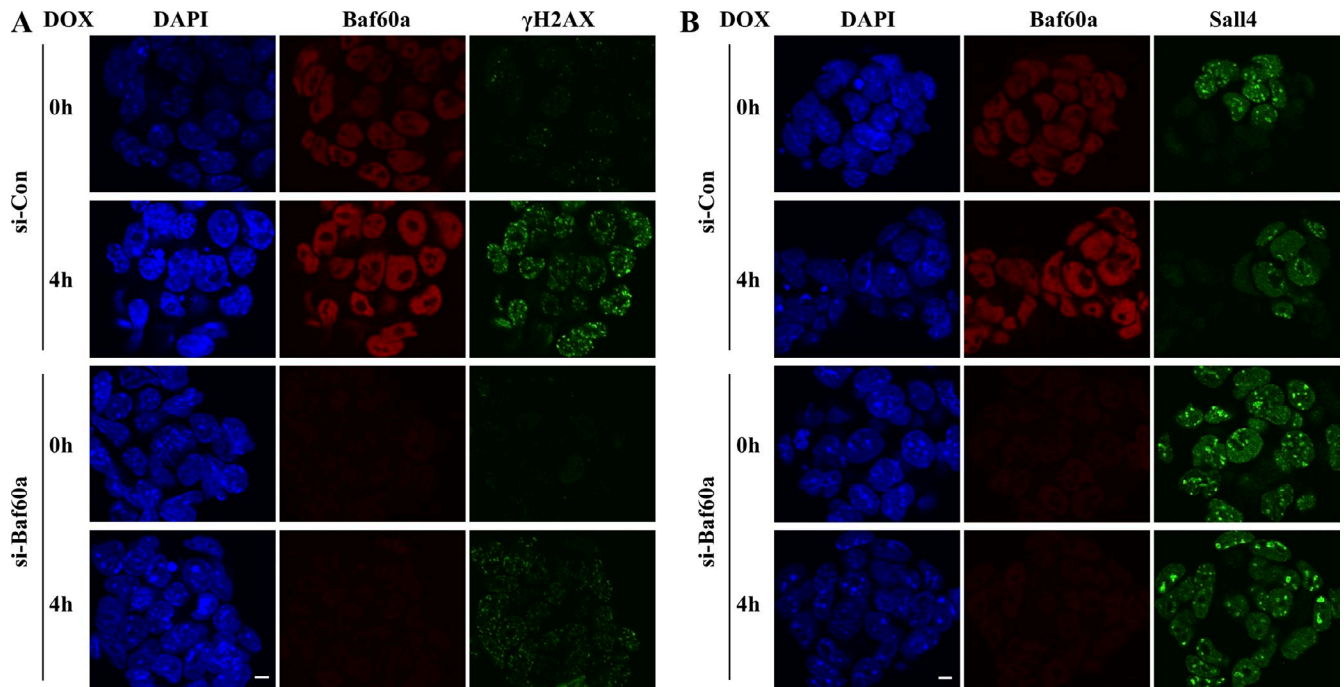


Figure S2. **Silencing of Baf60a inhibits the foci formation of  $\gamma$ -H2AX and the recruitment of Sall4 to DNA DSBs in ESCs.** (A and B) *Sall4*<sup>+/-</sup> and *Sall4*<sup>-/-</sup> ESCs were mixed and treated with Baf60a-specific siRNA and IR or mock treated and examined for the foci formation of  $\gamma$ -H2AX (A) and Sall4 (B). DNA is counterstained with DAPI (blue). si-Con, control siRNA. Bars, 5  $\mu$ m.

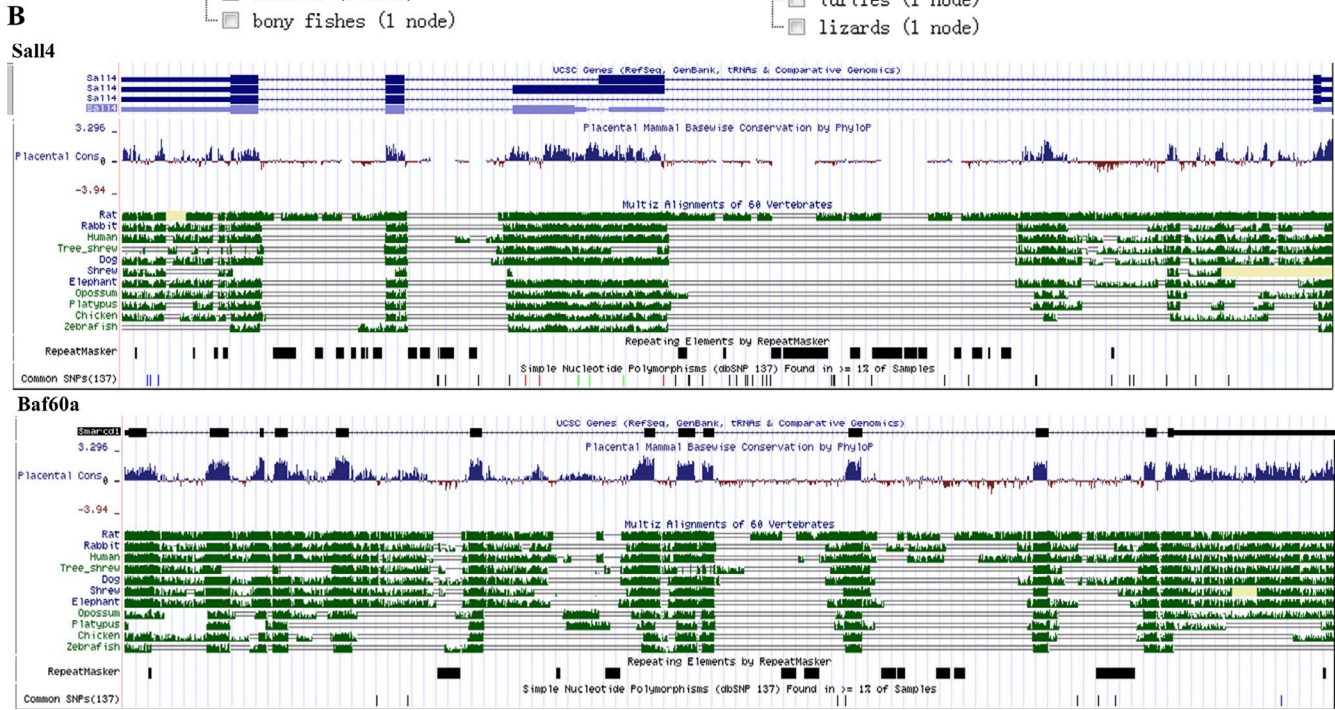
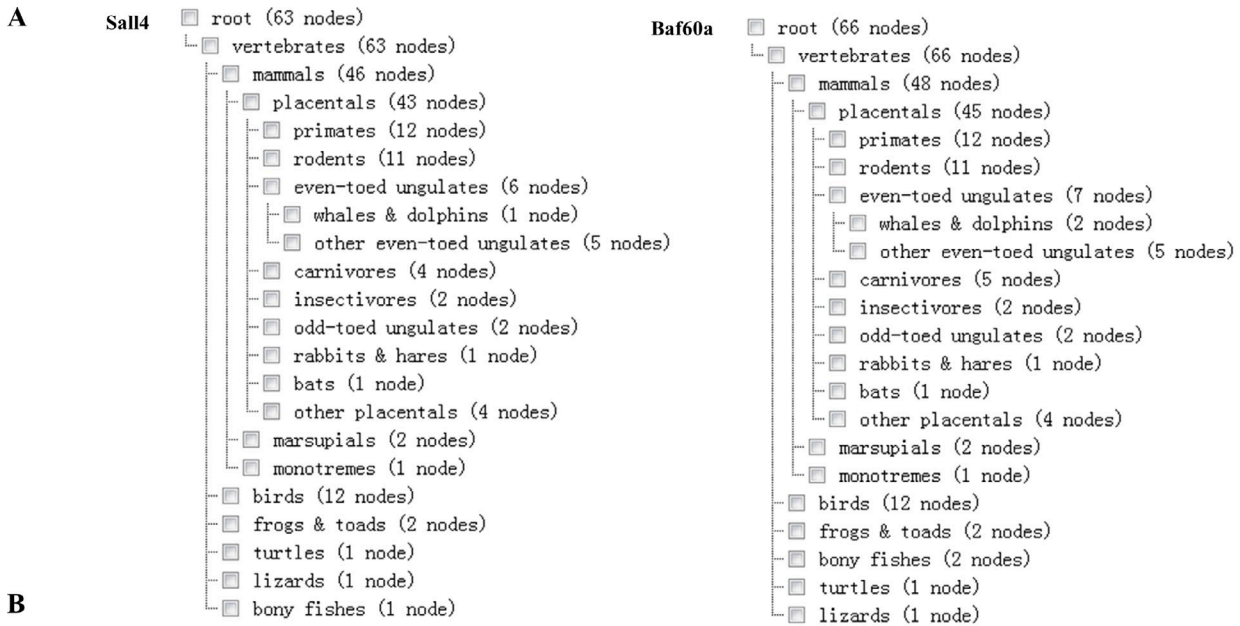


Figure S3. **Taxonomic trees and sequence conservation of Sall4 and Baf60a.** (A) Taxonomic trees of Sall4 and Baf60a. Taxonomic trees of species from Table S1 are constructed using Taxonomy Common Tree program. (B) Sequence conservation of Sall4 and Baf60a during evolution. The sequences are obtained from UCSC Genome Browser.

Table S1. Phylogenetic distribution of Sall4 and Baf60a

Species containing Sall4 homologue	Species containing Baf60a homologue
<i>Ailuropoda melanoleuca</i> (giant panda)	<i>Anas platyrhynchos</i> (mallard)
<i>Anas platyrhynchos</i> (mallard)	<i>Anolis carolinensis</i> (green anole)
<i>Anolis carolinensis</i> (green anole)	<i>Bos mutus</i> (wild yak)
<i>Bos mutus</i> (wild yak)	<i>Bos taurus</i> (cattle)
<i>Bos taurus</i> (cattle)	<i>Callithrix jacchus</i> (white-tufted-ear marmoset)
<i>Callithrix jacchus</i> (white-tufted-ear marmoset)	<i>Canis lupus familiaris</i> (dog)
<i>Canis lupus familiaris</i> (dog)	<i>Capra hircus</i> (goat)
<i>Capra hircus</i> (goat)	<i>Cavia porcellus</i> (domestic guinea pig)
<i>Cavia porcellus</i> (domestic guinea pig)	<i>Ceratotherium simum simum</i> (southern white rhinoceros)
<i>Ceratotherium simum simum</i> (southern white rhinoceros)	<i>Chinchilla lanigera</i> (long-tailed chinchilla)
<i>Chinchilla lanigera</i> (long-tailed chinchilla)	<i>Chrysemys picta</i> (painted turtle)
<i>Chrysemys picta</i> (painted turtle)	<i>Columba livia</i> (rock pigeon)
<i>Columba livia</i> (rock pigeon)	<i>Condylura cristata</i> (star-nosed mole)
<i>Condylura cristata</i> (star-nosed mole)	<i>Danio rerio</i> (zebrafish)
<i>Cricetulus griseus</i> (Chinese hamster)	<i>Dasybus novemcinctus</i> (nine-banded armadillo)
<i>Danio rerio</i> (zebrafish)	<i>Echinops telfairi</i> (small Madagascar hedgehog)
<i>Dasybus novemcinctus</i> (nine-banded armadillo)	<i>Equus caballus</i> (horse)
<i>Echinops telfairi</i> (small Madagascar hedgehog)	<i>Falco cherrug</i> (Saker falcon)
<i>Equus caballus</i> (horse)	<i>Falco peregrinus</i> (peregrine falcon)
<i>Falco cherrug</i> (Saker falcon)	<i>Felis catus</i> (domestic cat)
<i>Falco peregrinus</i> (peregrine falcon)	<i>Ficedula albicollis</i> (collared flycatcher)
<i>Felis catus</i> (domestic cat)	<i>Gallus gallus</i> (chicken)
<i>Ficedula albicollis</i> (collared flycatcher)	<i>Geospiza fortis</i> (medium ground-finch)
<i>Gallus gallus</i> (chicken)	<i>Heterocephalus glaber</i> (naked mole-rat)
<i>Geospiza fortis</i> (medium ground-finch)	<i>Homo sapiens</i> (human)
<i>Gorilla gorilla</i> (western gorilla)	<i>Ictidomys tridecemlineatus</i> (13-lined ground squirrel)
<i>Heterocephalus glaber</i> (naked mole-rat)	<i>Jaculus jaculus</i> (lesser Egyptian jerboa)
<i>Homo sapiens</i> (human)	<i>Loxodonta africana</i> (African savanna elephant)
<i>Ictidomys tridecemlineatus</i> (13-lined ground squirrel)	<i>Macaca fascicularis</i> (crab-eating macaque)
<i>Jaculus jaculus</i> (lesser Egyptian jerboa)	<i>Macaca mulatta</i> (Rhesus monkey)
<i>Loxodonta africana</i> (African savanna elephant)	<i>Meleagris gallopavo</i> (turkey)
<i>Macaca fascicularis</i> (crab-eating macaque)	<i>Melopsittacus undulatus</i> (budgerigar)
<i>Macaca mulatta</i> (Rhesus monkey)	<i>Mesocricetus auratus</i> (golden hamster)
<i>Meleagris gallopavo</i> (turkey)	<i>Microtus ochrogaster</i> (prairie vole)
<i>Melopsittacus undulatus</i> (budgerigar)	<i>Monodelphis domestica</i> (gray short-tailed opossum)
<i>Mesocricetus auratus</i> (golden hamster)	<i>Mus musculus</i> (house mouse)
<i>Microtus ochrogaster</i> (prairie vole)	<i>Mustela putorius furo</i> (domestic ferret)
<i>Monodelphis domestica</i> (gray short-tailed opossum)	<i>Myotis brandtii</i> (Brandt's bat)
<i>Mus musculus</i> (house mouse)	<i>Nomascus leucogenys</i> (northern white-cheeked gibbon)
<i>Mustela putorius furo</i> (domestic ferret)	<i>Ochotona princeps</i> (American pika)
<i>Myotis brandtii</i> (Brandt's bat)	<i>Octodon degus</i> (degu)
<i>Nomascus leucogenys</i> (northern white-cheeked gibbon)	<i>Odobenus rosmarus divergens</i> (Pacific walrus)
<i>Ochotona princeps</i> (American pika)	<i>Orcinus orca</i> (killer whale)
<i>Octodon degus</i> (degu)	<i>Ornithorhynchus anatinus</i> (platypus)
<i>Odobenus rosmarus divergens</i> (Pacific walrus)	<i>Otolemur garnettii</i> (small-eared galago)
<i>Orcinus orca</i> (killer whale)	<i>Ovis aries</i> (sheep)
<i>Ornithorhynchus anatinus</i> (platypus)	<i>Pan paniscus</i> (pygmy chimpanzee)
<i>Otolemur garnettii</i> (small-eared galago)	<i>Pan troglodytes</i> (chimpanzee)
<i>Ovis aries</i> (sheep)	<i>Papio anubis</i> (olive baboon)
<i>Pan paniscus</i> (pygmy chimpanzee)	<i>Pongo abelii</i> (Sumatran orangutan)
<i>Pan troglodytes</i> (chimpanzee)	<i>Pseudopodoces humilis</i> (Tibetan ground-tit)
<i>Papio anubis</i> (olive baboon)	<i>Rattus norvegicus</i> (Norway rat)
<i>Pongo abelii</i> (Sumatran orangutan)	<i>Saimiri boliviensis</i> (Bolivian squirrel monkey)
<i>Pseudopodoces humilis</i> (Tibetan ground-tit)	<i>Sarcophilus harrisii</i> (Tasmanian devil)
<i>Rattus norvegicus</i> (Norway rat)	<i>Sorex araneus</i> (European shrew)
<i>Saimiri boliviensis</i> (Bolivian squirrel monkey)	<i>Sus scrofa</i> (pig)
<i>Sarcophilus harrisii</i> (Tasmanian devil)	<i>Taeniopygia guttata</i> (zebra finch)
<i>Sorex araneus</i> (European shrew)	<i>Trichechus manatus latirostris</i> (Florida manatee)
	<i>Tursiops truncatus</i> (bottlenosed dolphin)
	<i>Xenopus (Silurana) tropicalis</i> (western clawed frog)
	<i>Xenopus laevis</i> (African clawed frog)

Table S1. **Phylogenetic distribution of Sall4 and Baf60a** (Continued)

Species containing Sall4 homologue	Species containing Baf60a homologue
<i>Sus scrofa</i> (pig)	
<i>Taeniopygia guttata</i> (zebra finch)	
<i>Trichechus manatus latirostris</i> (Florida manatee)	
<b><i>Xenopus (Silurana) tropicalis</i></b> (western clawed frog)	
<b><i>Xenopus laevis</i></b> (African clawed frog)	
<i>Zonotrichia albicollis</i> (white-throated sparrow)	

All the species information of Sall4 and Baf60a were retrieved from the NCBI Gene database. The shared species encompassed by both Sall4 and Baf60a are highlighted in bold.

**Table S2 shows the proteins interacting with Sall4 revealed by MS and is provided online as an Excel file.**