

**DETERMINING
RELATIONSHIP BETWEEN
DNA REPAIR MECHANISM
AND REGULATION AND
MAMMALIAN LIFE SPAN**

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SPECIES

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name	scientific name	life span	ref #	Taxa
mouse	<i>mus musculus</i>	1.5-5	GCF_000001635.2 7	Rodentia
rat	<i>rattus norvegicus</i>	2-3 years	GCF_036323735.1	Rodentia
rabbit	<i>Oryctolagus cuniculus</i>	5-10 years	GCF_009806435.1	Lagomorpha
cat	<i>Felis catus</i>	12-15 years	GCF_018350175.1	Carnivora
dog	<i>Canis lupus familiaris</i>	10-13 years	GCF_011100685.1	Carnivora
chimpanzee	<i>Pan troglodytes</i>	40-50 years	GCF_028858775.2	primate
gorilla	<i>gorilla gorilla</i>	35-40 years	GCF_029281585.2	primate
african elephant	<i>Loxodonta africana</i>	60-70 years	GCF_000001905.1	Proboscidea
asain elephant	<i>Elephas maximus</i>	60-80 years	GCF_024166365.1	Proboscidea
dolphin	<i>Tursiops truncatus</i>	40-50 years	GCF_011762595.1	Delphinidae
killer whale	<i>Orcinus orca</i>	50-100 years	GCF_937001465.1	Delphinidae
human	<i>homo sapiens</i>	70-80 years	GCF_000001405.4 0	Primates
bue whale	<i>Balaenoptera musculus</i>	18-29 years	GCF_009873245.2	Cetacea
platypus	<i>Ornithorhynchus anatinus</i>	10-15 years	GCF_004115215.2	Monotremata
American pika	<i>Ochotona princeps</i>	3-7 years	GCF_030435755.1	Lagomorpha
Snake	<i>Thamnophis elegans</i>		GCF_009769535.1	out

BACKGROUND

- Throughout an organism's lifespan it is faced with an increasing number of attacks against its genomic information
- Mammalian lifespan variation is related to species specific ecological conditions
- DNA repair mechanisms include: base excision repair, nucleotide excision repair, DNA mismatch repair, and dsDNA break repair
- In order to defend against the number of DNA damaging affects, it is hypothesized that organisms with longer lifespans with have more DNA repair mechanisms

WORKFLOW

Obtain annotated genomes

OrthoFinder

Gene Ontology

MAFFT

FastTree

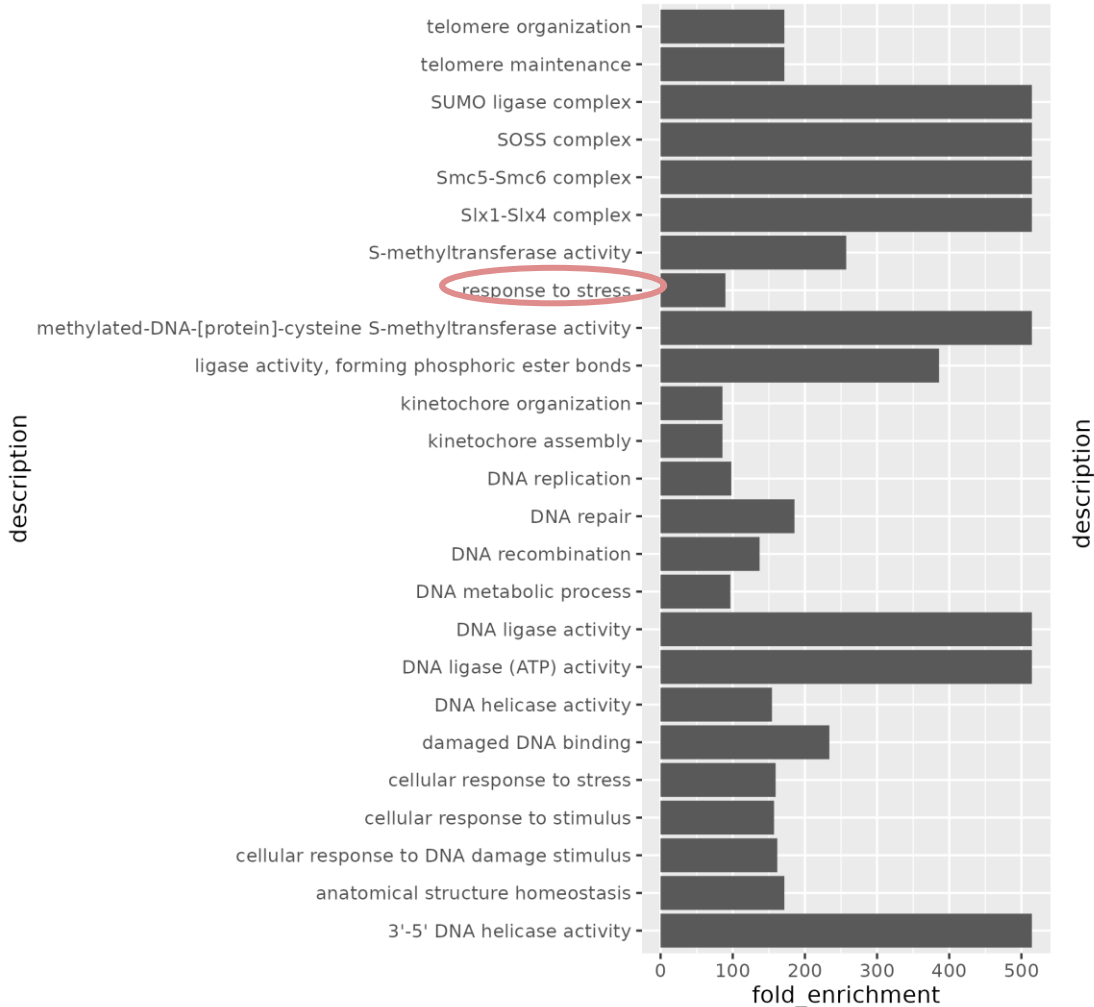
Species Tree Based on DNA repair gene families

GENE ONTOLOGY

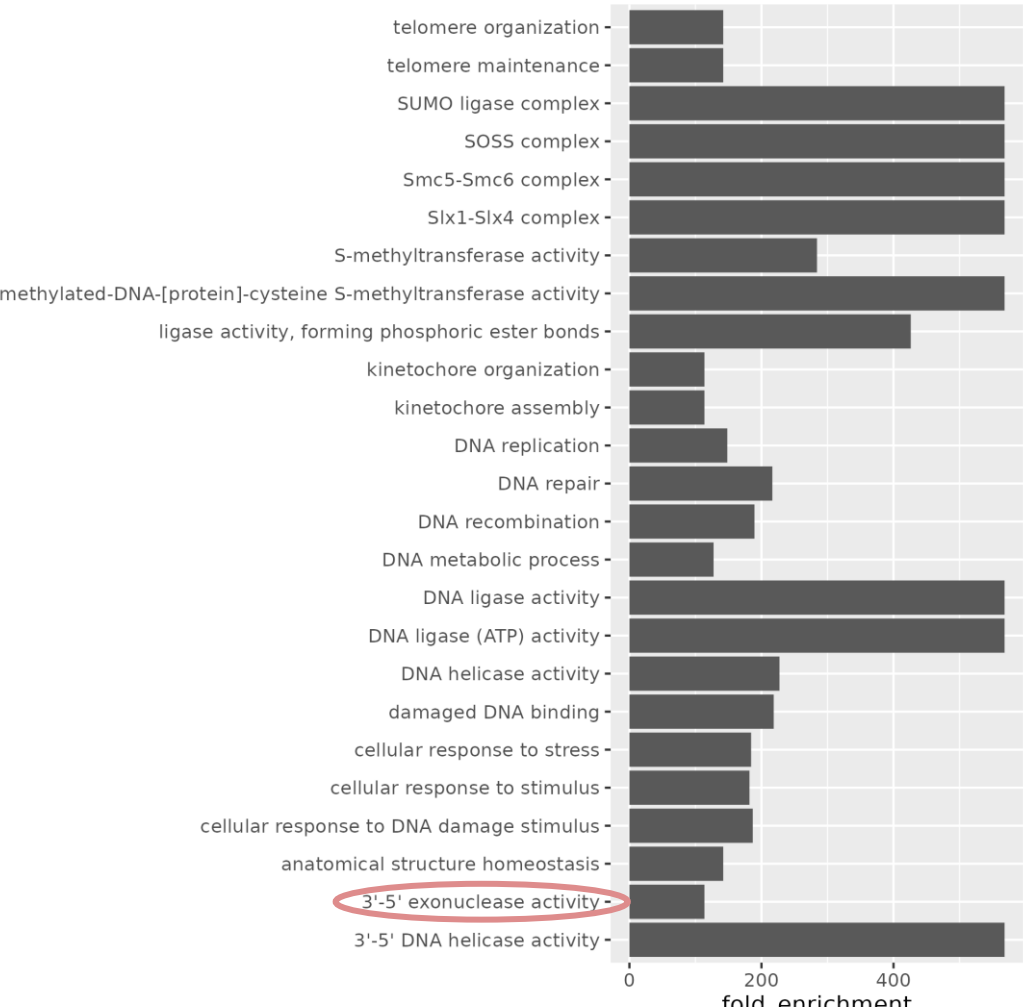


GENE ONTOLOGY

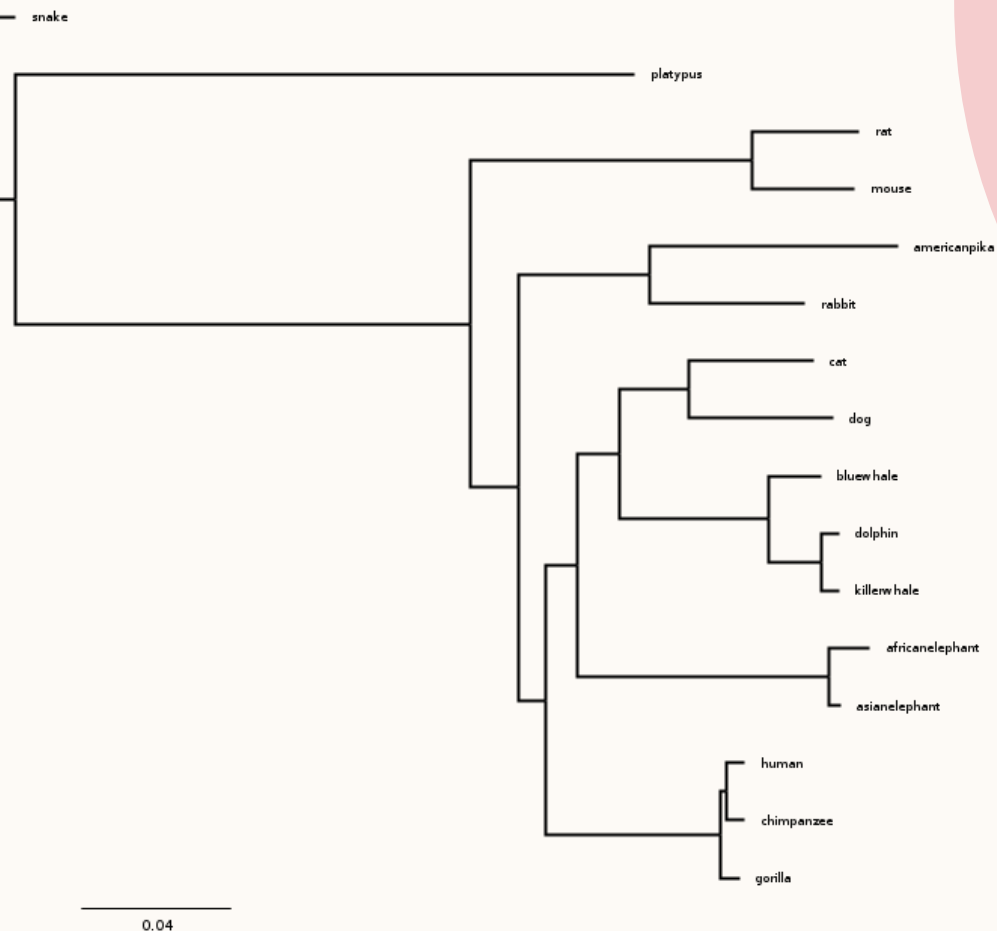
Killer Whale GO Enrichment



Mouse GO Enrichment

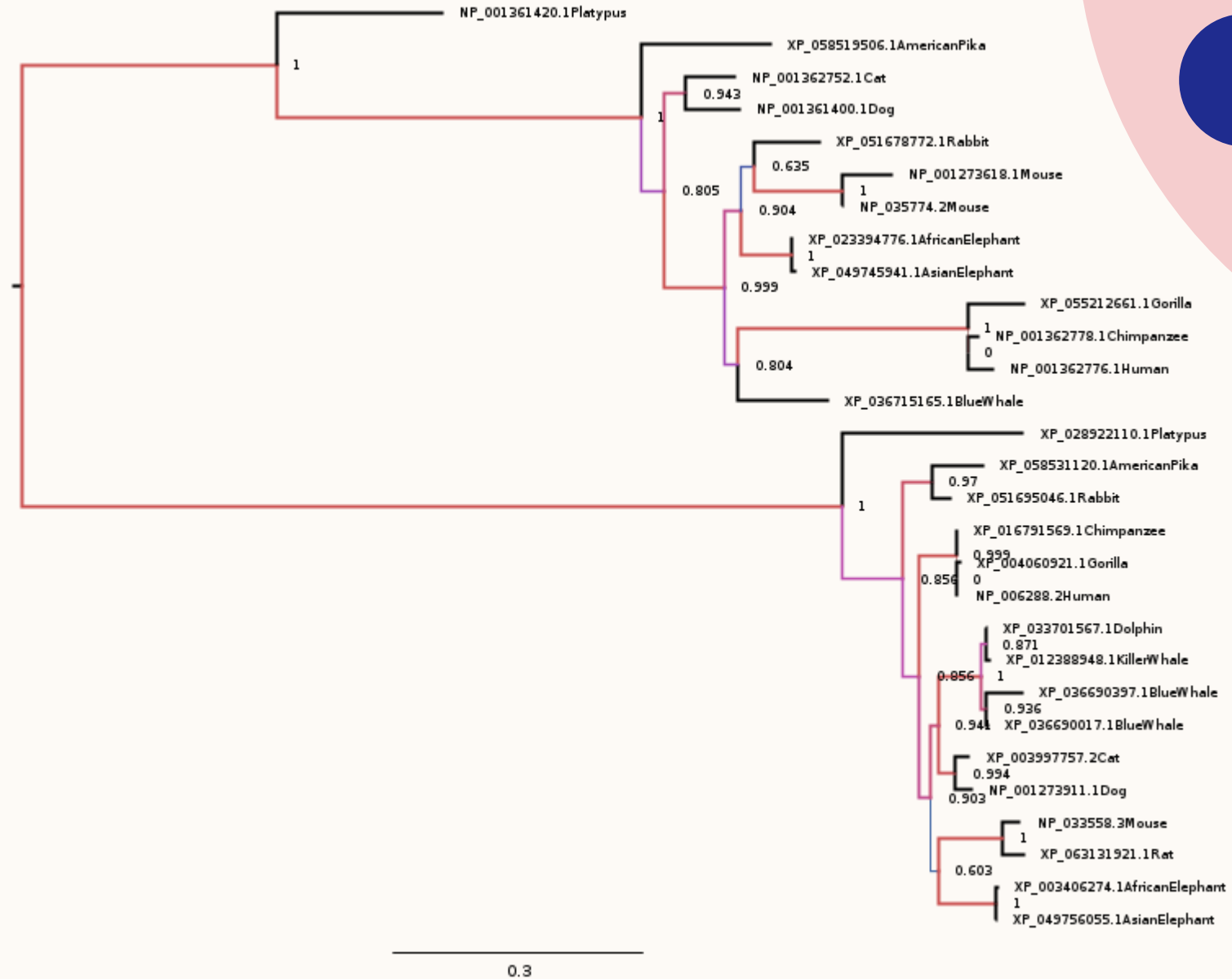


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OG0001397	OG0007983	OG0004212
OG0001474	OG0007990	OG0004787
OG0001617	OG0008111	OG0005038
OG0001673	OG0008389	OG0005411
OG0002059	OG0009001	OG0005510
OG0002153	OG0009427	OG0005583
OG0002200	OG0009859	OG0006049
OG0002204	OG0009940	OG0013573
OG0002284	OG0010437	OG0013908
OG0002305	OG0010538	OG0014662
OG0002896	OG0011018	OG0014815
OG0003181	OG0011369	OG0014844
OG0003218	OG0011846	OG0015187
OG0003269	OG0012711	OG0015268
OG0003332	OG0013263	OG0015478
OG0003362	OG0013484	OG0016133
OG0003794	OG0013542	OG0016599



ORTHOFINDER

GENE TREE



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