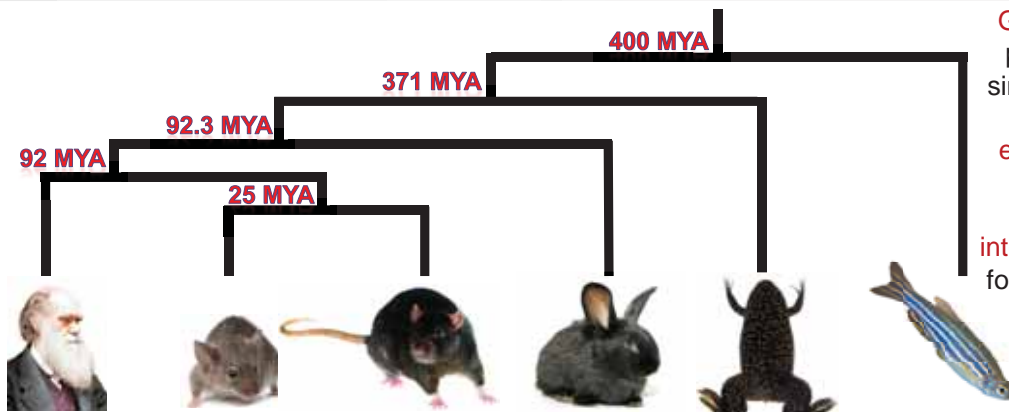


# ANIMAL MODELS, DRUG TARGETS AND EVOLUTION

Lu *et al* (2013) conducted studies on the **evolutionary history** of genes along with **converging pathways** in metabolism. This way they have predicted around many potential targets for **anti cancer drugs** with **negative genetic interactions**. However, it needs to be explored that if a drug has been designed and needs to be tested, which **animal model** in evolutionary and genetic sense would be best representative for humans



Of all, three **drug targets** as elucidated by Lu *et al* (2013) were analysed for the expansion and contraction of gene and homologues in selected **vertebrate animal models**



**Gene expansion** often produced genes with similar and/or additional functions. Therefore **evolutionary history** of genes targeted for **chemotherapeutic interventions** is important for better representative analyses

Drug Targets	<i>H.sapiens</i>	<i>M.musculus</i>	<i>R.rattus</i>	<i>O.cuniculus</i>	<i>X.tropicalis</i>	<i>D.erio</i>	Inferences
<i>LSMD1</i>	<i>LSMD1</i>	<i>Lsmd1</i>	<i>Lsmd1</i>	<i>Lsmd1</i>	<i>lsm1</i>	<i>lsm1</i>	Genes not expanded in any of the model animals
<i>PPWD1</i>	<i>PPWD1</i> <i>PP1L3</i> <i>PP1L1</i> <i>CWC27</i> <i>PP1L4</i> <i>PP1B</i> <i>PP1L2</i> <i>PP1C</i> <i>PP1H</i>	<i>Ppwd1</i> <i>Pp1l3</i> <i>Pp1l1</i> <i>Cwc27</i> <i>Pp1l4</i> <i>Pp1b</i> <i>Pp1l2</i> <i>Pp1c</i> <i>Pp1h</i>	<i>Ppwd1</i> <i>Pp1l3</i> <i>Pp1l1</i> <i>Cwc27</i> <i>Pp1l4</i> <i>Pp1b</i> <i>Pp1l2</i> <i>Pp1c</i> <i>Pp1h</i>	<i>Ppwd1</i> <i>Pp1l3</i> <i>Pp1l1</i> <i>Cwc27</i> <i>Pp1l4</i> <i>Pp1b</i> <i>Pp1l2</i> <i>Pp1c</i> <i>Pp1h</i>	<i>ppwd1</i> <i>pp1l3</i> <i>pp1l1</i> <i>cwc27</i> <i>pp1l4</i> <i>pp1b</i> <i>pp1l2</i> <i>pp1c</i> <i>pp1h</i>	<i>ppwd1</i> <i>pp1l3</i> <i>pp1l1</i> <i>cwc27</i> <i>pp1l4</i> <i>pp1b</i> <i>pp1l2</i> <i>pp1c</i> <i>pp1h</i>	Genes have not undergone gene death in the compared animals as ratio between human and other animal paralogues is 1:1
<i>PPIE</i>	<i>PPIE</i> <i>PPIF</i> <i>PPIA</i> <i>RGPD6</i> <i>PP1AL4A</i> <i>PGDD5</i> <i>RANBP2</i> <i>PGDPD3</i> <i>RDPD8</i> <i>RGDPD1</i> <i>PP1AL4D</i> <i>RGPD4</i> <i>PP1AL4B</i> <i>RGPD2</i> <i>PP1AL4C</i> <i>P1AL4G</i>	<i>Ppie</i> <i>Ppif</i> <i>Ppia</i> (3) X X <i>Ranbp2</i> X X X X X X <i>Pp1al4c</i> X	<i>Ppie</i> <i>Ppif</i> <i>Ppia</i> (5) X <i>Pp1al4a</i> X <i>Ranbp2</i> X X X X <i>Pp1al4d</i> X <i>Pp1al4b</i> X <i>Pp1al4c</i> X	<i>Ppie</i> <i>Ppif</i> <i>Ppia</i> (2) X X <i>Ranbp2</i> X X X X X X <i>Pp1al4c</i> X	<i>Ppie</i> <i>Ppif</i> <i>ppia</i> X X <i>ranbp2</i> X X X X X X X X X	<i>Ppie</i> <i>ppif</i> <i>ppia</i> (3) X X X X X X X X X X X X X	Large number of human paralogues are not present in many model animals due to the gene death or they may not have been originated. Similarly in humans PP1A may have undergone gene death (X)