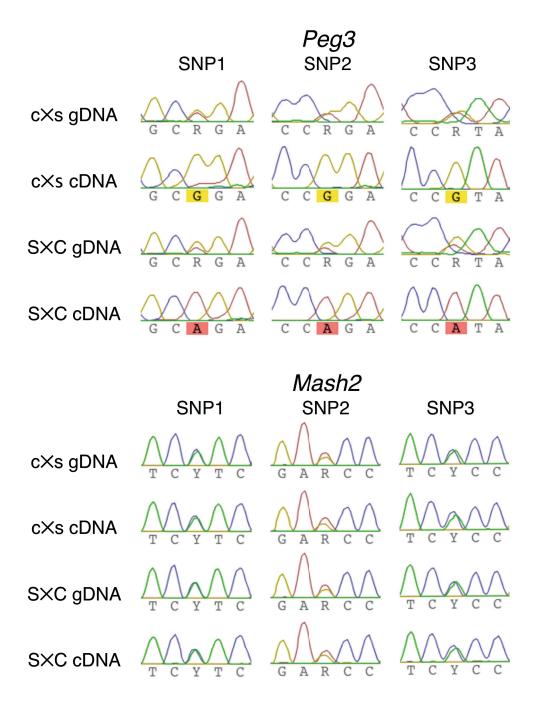
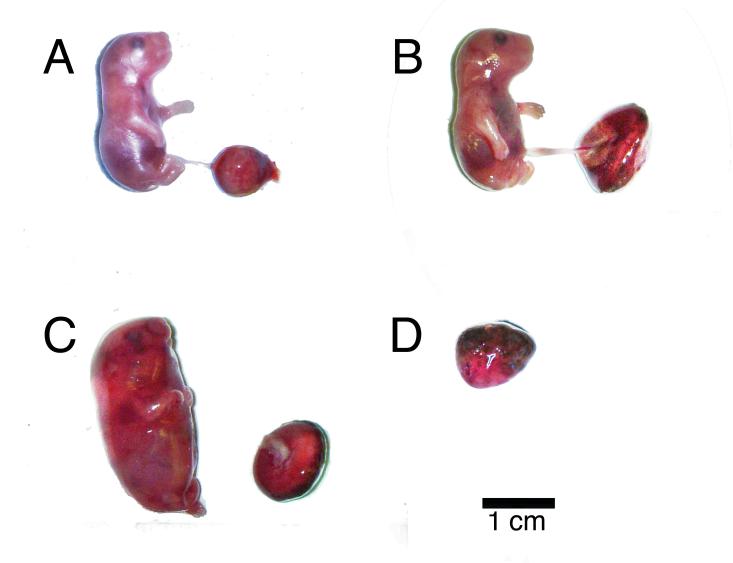
Supplemental Figure 1



Supplemental Figure 1: Examples of a gene that is properly imprinted in reciprocal hybrids (*Peg3*, top) and one that shows biallelic expression in hybrids (*Mash2*, bottom). Genomic DNA (gDNA) and complement DNA (cDNA) from the same individiual demonstrate heterozygosity at three fixed differences in the gDNA sequences for both of these genes. In contrast, when cDNA is sequenced, these heterozygous postitions show imprinted expression of *Peg3* and biallelic expression of *Mash2*.

Supplemental Figure 2



Supplemental Figure 2: (A) Normal *P. campbelli* offspring with average sized placenta. (B) Overgrown SXC offspring with an enlarged placenta. (C) Overgrown SXC offspring with severe edema (swelling) of the body and an enlarged placenta. (D) Overgrown SXC molar conceptus. All images are to scale.

Table S1: Mammalian crosses that show abnormal growth effects

Part									
Statistics Sta							Divergence (Dxy) at cyt b		
Article Street Process Brown from Street Brown from	Order	Family	Parent 1	Parent 2	1x2 2x1	Reference	(K2P corrected)	Dxy	Quote
Article Street Process Brown from Street Brown from	Artiodactyla	Boyidae	Ammotragus lervia	Capra hircus	NA Small	Grav (1972) #382	0.1244	AF034731 1 AB044308 1	"full-term hybrid kids [were] smaller than average full-term goat kids "
Actional part Boundary Boun			Rican bican						"make in particular show between in respect of body size a make bubyid born at Schoenbrunn was as beauty at 2 years
Antibus Park Bank	titiodactyia	Dovidac	DISON DISON	DISON DONUSUS	Large Large	Glay (1972) #303	0.0773	AT 030273.1, 1 13003.1	
Animal									
Seminate	Artiodactyla	Bovidae	Bison bison	Bos taurus	Large Large	Gray (1972) #383	0.0712	AF036273.1, GU249573.1	
Seminate									calves and dams have resulted from matings between bison bulls and domestic cows, as the latter invariably secrete
Part									
Armonism									Is the demonstraction bull a binour new proceedings of abstract in the state of the
Provided									
Part	Artiodactyla	Bovidae	Bison bonasus	Bos taurus	Large Large	Gray (1972) #384	0.0712	GU249573.1, Y15005.1	
Annichative Routine									of life), disease resistance, strength, and cold tolerance. When the wisent was the dam, the birth weight of the calves was
Annichative Routine									less than when the domestic cow was the dam "
Activation Bottom	Artiodactula	Dovidae	Ros grunnians	Por indicus	Large Large	Grav (1972) #289	0.0742	EUR07052 1 EE061244 1	
Activation Communication									
Antiological Brothe Cupre forms Cupr	Artiodactyia	Bovidae	Bos grunniens	Bos taurus	Large Large	Gray (1972) #389	0.0757	EU80/952.1, GU2495/3.1	
Anticlacity									
Armichacyla Camelular Caredian formations Large Intermediate Caredian formations Large Intermediate Caredian formations Caredian formations Large Intermediate Caredian formations Caredian formations Large Intermediate Caredian formations Large Intermediate Caredian formations Large Intermediate Caredian formations Large Intermediate	Artiodactyla	Bovidae	Capra hircus	Capra caucasica	Large NA	Gray (1972) #394	0.0385	AB044308.1, DQ246801.1	"The F1 hybrids reported by Misarev were heavier than either parental species at 4/5 years"
Armichacyla Camelular Caredian formations Large Intermediate Caredian formations Large Intermediate Caredian formations Caredian formations Large Intermediate Caredian formations Caredian formations Large Intermediate Caredian formations Large Intermediate Caredian formations Large Intermediate Caredian formations Large Intermediate	Artiodactyla	Boyidae	Ovis aries	Ovis ammon karelini	Large NA	Grav (1972) #446	0.0312	IX567831 1 AI867276 1	"In general appearance, conformation, and temperment the F1 hybrids tend to resemble the wild species, but they surpass
Articlescyle Cervice of Cervice eligible collection Articlescyle Cervice Cervice and Cervice eligible collection Articlescyle Cervice Cervice and Cervice eligible collection Articlescyle Cervice Cervice and Cervice eligible collection Cervice Pictics Folio control Felicia F						, ()			
Articles (Price of Create Complete leglem Correct Complete Service Control of Part Agency C	and discrete	Constitution	0 1 1	0 1 1 1:	Torrest Total Cata	C (1072) #522	0.1062	13/12//25 1 13/12//20 1	
Article-cyla Cervice Cervice Cervice Cervice Cervice Cervice Committee Commi	Artiodactyia	Cameridae	Cameius vactrianus	Cameius aromeaarius	Large Intermediate	Gray (1972) #332	0.1062	AY 120025.1, AY 120030.1	
Archicelysis Cervoide Renighes command termodules (Curvoir ede Renighes termodule cardonal cardonal Lage NA Gray (1973) 4888 NA No. data for Cervor edember cardinal renders of Renighes termodule cardonal Lage NA Gray (1973) 463 0.1387 [Per 14] (1965) 18 [Per 1									characteristics. The F1 hybrids are large, strong animals equally well adapted for draft and pack work. The cross between
Archicelysis Cervoide Renighes command termodules (Curvoir ede Renighes termodule cardonal cardonal Lage NA Gray (1973) 4888 NA No. data for Cervor edember cardinal renders of Renighes termodule cardonal Lage NA Gray (1973) 463 0.1387 [Per 14] (1965) 18 [Per 1									the male dromedary and the female bactrian camel is larger than the reciprocal cross at 3 months of age."
Articles Carrives	Artiodactyla	Cervidae	Cerrais elanhus elanhus	Cervus elaphus asiaticus	Large NA	Gray (1972) #498	NΔ	No data for Cannus alanhus asiatious	
Carrieves Pelluke Felix cannel (Carrieves Felix Felix Ferix Carrieves Felix Felix Ferix Carrieves Felix Felix Ferix Carrieves Felix Felix Ferix Carrieves Felix Felix Ferix Fe								AV726601 1 DO672126 1	
Carnivers Englane Falpher full Large NA Gary (1972) #163 0.1387 JOSOSTER, 1479851.11 The plant arguested both parental species in growth met and body length. They are stronger of the plant arguested by Plant was read and body length. They are stronger of the plant arguested by Plant was read and body length. They are stronger of the plant arguested by Plant was read and body length. They are stronger of the plant was read and the plant was read and they length. They are stronger of the	titiodactyia	Cervidae	Kangijer iaranaus iaranaus	Kangger taranaus caribou	Large INA	Giay (1972) #330	0.0036	A1 /20081.1, DQ0/3133.1	
Foliate Folia carbon Foliate Folia carbon Foliate Folia carbon Foliate Foliate Carbon Foliate									
February	.`arnivora	Canidae	Vulpes fulva	Alopex lagopus	Large NA	Gray (1972) #163	0.1387	JQ003578.1, AY598511.1	"The hybrid surpassed both parental species in growth rate and body length. They are stronger and more vicious than
Carriova Felidae Felix cantas Felix selected (Phase cancelor) Phase cancelor (Phase cancelor)									
Carrivora Felidae Patter partuda secondor of Paumbert partuda (Carrivora Felidae Patters partuda fasces Felidae Patters partuda fasces Felidae Patters partuda fasces Felidae Patters f		Estidas	F-1:	E-liibt-	Lamas NIA	C (1072) #120	0.0042	AD104917 1 EE690045 1	
Carnivora Feliche Pautors parkingscay Felic control of Felicide Pautors for the Carnivora Felicide Pautors for					Large IVA				
Ferrinder Pauthers agent Eagus Ferrinder Pauthers agent Eagus Ea									
Carnivora Musteliale Autority of Periodically and Periodi			Panthera pardus fusca	Felis concolor (Puma concolor)		Gray (1972) #131		GU175442.1, EF056506.1	
Carnivora Mastelidae Management of Part 19 was designed as much as both parents register. A Femiliar Part 19 was designed as much as both parents register. A Femiliar Part 19 was designed as much as both parents register. A Femiliar Part 19 was designed as much as both parents register. A Femiliar Part 19 was designed as much as both parents register. A Femiliar Part 19 was designed as much as both parents are part 19 was designed as much as both parents are designed as when the location is designed as much as both parents are designed as the witten in the parents are part 19 was designed as much as both parents are designed as much as both parents are designed as the witten in the parents are part 19 was designed as much as both parents are part 19 was designed as much as both parents are designed as few wittens; in the reciprocal real parents are part 19 was designed as much as both parents are designed as few wittens; in the reciprocal real parents are part 19 was designed as much as both parents are part 19 was designed as much as both parents are part 19 was designed as much as both parents ar	Carnivora	Felidae	Pantera leo	Panthera tigris	Large Small	Grav (1972) #141	0.1158	JX023542.1. KC879296.1	"The hybrids [Tiger female x Lion male] are often larger than either parental species. According to Reisinger, one male
Felidee Puntera onca Puntera parda Large Intermediate Gray (1972) #142 0.1376 EF056506.1, GU17545.5.1 When havely no mornis of age, the hybridefemale P pardus x male P onca) surpassed their during the period of the p					- 5				
Feliules Fel									
Currieves Currie									
Carnivora Musteliade Junorius furo Carnivora Ursade and material putorius furo Carnivora Ursade and material putorius furo Ursade constitution of the brokens were considerably stronger than bornato or instantant of the Same age." The Principal Carnivora material putorius furo Carnivora Ursade Thalacter maritimus (Irsus maritimus) Equate Equate Equate Equate Equate strong Equate Equate Equate Sequence of the Same age. Equate Equate Equate Equate Equate Sequence of the Same age. Equate Equate Equate Equate Equate Sequence of the Same age. Equate Equate Equate Equate Equate Sequence of the Same age. Equate Equate Equate Equate Equate Sequence of the Same age. Equate Equate Equate Equate Equate Sequence of the Same age. Equate Equate Equate Equate Equate Sequence of the Same age. Equate Equate Sequence of the Sam	L'arnivora	Felidae	Pantera onca	Panthera pardus	Large Intermediate	Gray (1972) #142	0.1376	EF056506.1, GU175435.1	
Carnivora Mastellas Musicin furnor in furno Carnivora (Ursia ten arithmetic (Paris marithmetic) (Paris sucreta midelandorff) [Large Large Gray (1972) 1918 0.01026* APD (1972) 1918 1.00126* APD (1972) 1918									years they were intermediate between sire and dam at height at the withers. [In the reciprocal cross] At 6 months of age,
Carnivora Mastellas Musicin furnor in furno Carnivora (Ursia ten arithmetic (Paris marithmetic) (Paris sucreta midelandorff) [Large Large Gray (1972) 1918 0.01026* APD (1972) 1918 1.00126* APD (1972) 1918									the hybrods were considerably stronger than leonards or jaguars of the same age."
Currioure Ursidae Fundactor maritimus (Ursus maritimus) Equidae Equius extrus Equivar extrus Perissodactyla Equidae Equius extrus Equivar e		Mustalidas	16-4-1	Martin material	Lamas NIA	C (1072) #100	0.0000	A D026102 1 A E057129 1	
Perissodactyla Equidae Equis assimus Equis gerrys I. Large Large Crity (1972) p832. Perissodactyla Equidae Equis assimus Equis assimus Equis conformation and display the Perissodactyla Equidae Equis assimus Equis assimus Equis conformation and display the Perissodactyla Equidae Equis assimus Equis assimus Equis conformation and display the Perissodactyla Equidae Equis assimus									
Perissodactyla Equidae Equus astims Equus hemionus onager Lage NA Gray (1972) #352 00517 JF718884.1, FF718887.1 "the behividae was aid to be larger and of better appearance than mules or seases." Perissodactyla Equidae Equus astimus Equus technical uniquorum Equus condultus Lage NA Gray (1972) #352 00773 JF718884.1, CF708811.1 Donkers carryine liveridas show enlared endometrial curs compared to horse carryine hivride Perissodactyla Equidae Equus barchelid uniquorum Equus condultus Lage NA Gray (1972) #352 00773 JF718888.1, FF718885.1 "The male livery of legislate Equus barchelid uniquorum Equus condultus Lage NA Gray (1972) #352 00783 JF718888.1, JF718885.1 "The male livery of legislate Equus barchelid uniquorum Equus condultus Lage NA Gray (1972) #362 00848 KCV68811.1 JF718889.1 "The male Cercophicidae Macocar artificat In the miles proportion of the male proportion of the male proportion of the miles and proportion of the male proportion of the miles and proportion of the male proportion of the male proportion of the miles and proportion of the male proportion of the male proportion of the male proportion of the male proportion of the miles and proportion of the male proport						Gray (1972) #194	0.0126**	AP012597.1, EU497665.1	
Perissodactyla Equide Equis as mins Equis seminors onager Lage Name Lage Small Allen (1969), Alten (1993), Gray (1972) #532 0073 JF188841, IF188851 One-to-examinate phase of the pressonance of the phase of t	'erissodactyla	Equidae	Equus asinus	Equus grevyi	Large Large	Gray (1972) #352	0.0562	JF718884.1, JF718890.1	"the [E. grevyi x E. asinus] hybrids are superior to either parent in action, conformation and disposistion. The [E. asinus x
Perissodactyla Equide Equis as mins Equis seminors onager Lage Name Lage Small Allen (1969), Alten (1993), Gray (1972) #532 0073 JF188841, IF188851 One-to-examinate phase of the pressonance of the phase of t									E. grevyi] hybrids reported by Rzasnicki grew rapidly, and at 2 years of age were larger than their dam."
Perissodactyla Equidae Equus attrust Equis provided (a Equus attrust) Equidae (Equus homelatic languarum Equis provided) (Equis homelatic languarum) Equis provided) (Equis homelatic languarum) Equis provided) (Equis homelatic languarum) (Equis	Daricco da ctula	Equidae	Fanne asimus	Equip hamionus onagar	Larga, NA	Grav (1972) #252	0.0517	TE719994 1 TE719997 1	
Perissodactyla Equidae Equis bruchell antiquorum Equis presendes Equis benefit antiquorum Equis consistence Equis candidation Equis consistence Equis candidation Equis candidat									
Perissodactyla Equidae Equus caballus Equis Equis Emonius blur Perissodactyla Equidae Equus scaballus Equis Equis Equis Equis caballus (Equis Equis caballus (Equis Equis caballus (Equis Equis caballus (Equis Equis Carcophicidae Macaca sinica (Equis Equis Equ					Large Small	Allen (1909), Allen (1993), Gray (1972) #352	0.07/3		
Perissolacy Equide Equise Equise Equise challas Large NA Gray (1972) #362 0.984 KC968811, LPT188891 "at one vear of ane fithe hybrid was tather small ab irth?" Primate Cercophthecide Macace a radiata Macace a sinca NA Small Gray (1972) #361 0.1309 AF359404, LEU204975.1 "The hybrids was tather small ab irth?" Primate Cercophthecide Cavida cea silemus Macace a silemus					Large NA				
Primate Cercophthecide Macaca radiata Macaca sinica Na Small Gray (1972) #63 NA Olada for Macaca sinica Cercophthecide Macaca silens macaco comestrina (Primate Lemuridae Lemur abilytons (Eulemur fulvus abilytrons) Lemur macaco (Eulemur macaco) Large NA Gray (1972) #316 0.1003* AF17858.61, LAF17584.91 "hybrids produced at the Hamburg Zoo were large, strong animals" Cavia apera (Cavia percellus Cavia porcellus porcellus Cavia Cavia Cavia Cavia porcellus Cavia Cavia Cavia Cavia porcellus Cavia Cavia Cavia Cavia Cavia Cavia Cavia Cavia Cavia									
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Primate Cercopithecidae Maccae silemus macaco (Elemur macaco) and elemur macaco (Elemur macaco (Cerconithecidae	Macaca radiata	Macaca sinica			NA	No data for Macaca sinica	"One hybrid was rather small at hirth"
Primate Lemur albifrons (Eulemur phaves albifrons) Lemur macaco (Lulemur macaco o) Rodentia Cavidae Cavia porcellus Cavia p									
Rodentia Cavidae Cavia porcellus porcelus porc									
Rodentia Cavidae Cavia porcellus Cavia fulgida Large Large Gray (1972) #332 0.0934 HM447187.1, GU136737.1 "Fl hybrids of both seces are remarkable vigorous, and their early growth rate is rapid. According to Ubisch and Mello, the hybrids are larger than Conceiling. Rodentia Cricetidae Clethrionomys rutilus Clethrionomys glareolus glareolus are larger than Conceiling. Rodentia Cricetidae Mesoricetus uneutoni Hubisch and Mello, the hybrids varied to the second and their early growth rate is rapid. According to Ubisch and Mello, the hybrids sended by Cinetina observation of the production of the second residue to the second residue									
Rodentia Cavidae Cavia porcellus Cavia procellus proce	Kodentia	Caviidae	Cavia porcellus	Cavia aperea	Large NA	Gray (1972) #330	0.0909	HM447187.1, GU136754.1	
Rodentia Cavidae Cavia porcellus Cavia procellus proce									parturition. Hybrids born at subsequent parturitions frequently survive. They have a high birth weight, show rapid growth
Rodentia Criceidae Criceidae Cichrinomys ruilius Clethrinomys glareolus glareolus Large NA Gray (1972) #332 0.934 HM447187.1, GUI36737.1 "Fl hybrids of both seces are remarkable vigeorous, and their early growth rate is rapid. According to Ubisch and Mello, the hybrids are later sur domestic guinnea pig." Rodentia Criceidae Mesoricenta aurunts Mesoricents aurunts Mesoricentus newtoni Large NA Gray (1972) #249 0.1509 10,687401.1, 10,927412.1 "A male and female hybrid obtained in Teheran were particularly large and vigorous animals." Rodentia Criceidae Peromyscus interparietalis Peromyscus eromicus Large NA Gray (1972) #273 NA No data for Peromyscus interparietalis "Rodentia Criceidae Peromyscus maniculatus blandus Large Small Gray (1972) #278 NA No data for Peromyscus leucocephalus Peromyscus maniculatus blandus Large Small Dawson (1965), Gray (1972) #281 0.0399 EF423875.1, DQ385827.1 ""There is high incidence of maternal focal death in the second half of pregnancy, and the P. p. oxfordinals) bears the Rodentia Criceidae Phologus sungorus Phologus campbelli Large Intermediate/Small Sokolov (1993) this study 0.0371 KF673395.1, GU046553.1 "Theybrids weight else a thirth and showed less rapid growth than the parentla species (P. maniculatus) bears the perolinomus) bears the larger hybrids weight of the hybrid deviates) bears when the parentla species (P. maniculatus) bears the perolinomus) bears the larger hybrids weight of the hybrids deviates) bears when the parentla species (P. maniculatus) bears the perolinomus) bears the larger hybrids weight of the hybrids deviates) bears when the parentla species (P. maniculatus) bears the perolinomus) bears the larger hybrids weight of the hybrids deviates) bears when the parentla species (P. maniculatus) bears the perolinomus) bears the larger hybrids weight of the hybrids deviated less at birth and showed less aribit than also weight than the parentla species [in the deviation of the parently deviated in Thera the parently approach than the parentla species [in the p									
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Rodentia Ciceidae Clehrionomys ruillus Clehrionomys glareolus glareolus Large NA Gray (1972) #244 0.0818 AB031581.1, DQ472348.1 "Fl brivités reported by Zimmermann showed hvbrid viaeour in me- and postnatal development. Rodentia Ciceidae Mesoriceus auratus Mesorcetus neutoni Large NA Gray (1972) #249 0.1509* JQ687401.1, JQ927412.1 "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "A male and female hvbrid obstaned in Febran were particularly large and viaeorous animals." "Ne hvbrids weigh obstant large were animals." "Ne hvbrids weigh obstant large material species." "Ne animals." "Ne hvbrids weigh obstant large animal	codentia	Cavildae	Cavia porceiius	Cavia juigiaa	Large Large	Gray (1972) #332	0.0934	HM44/18/.1, GU130/3/.1	F1 hybrids of both sexes are remarkable vigorous, and their early growth rate is rapid. According to Detiersen, male
Rodentia Criceitidae Merionens stristrami Merionens libycus Large NA Gray (1972) #244 0.0818 AB03158.1, D0472348.1 "Fl bybrids reported by Zimmeruna showed bybrid visour in pre- and postnatal development. Rodentia Criceitidae Merionens tristrami Merionens libycus Large NA Gray (1972) #254 0.1168 AB29035.1, AJ97338.1. "Large NA Gray (1972) #254 0.1168 AB29035.1, AJ97338.1. "Liter size was much smaller than in the parentla species, but the hybrids showed heterosis in rodentia Criceitidae Peromyscus interparietalis Peromyscus municulants blandus Large Small Gray (1972) #278 NA No data for Peromyscus interparietalis Peromyscus leucocephalus Peromyscus municulants blandus Peromy									hybrids are larger than C. porcellus, but according to Ubisch and Mello, the hybrids are later surpassed in weight by the
Rodentia Cricetidae Mesoricetus aurunts Mesoricetus newtoni Large NA Gray (1972) #249 0.1509* 10,088*401.1,0927412.1 "A male and female hybrid obtained in Teheran were particularly large and viscorous animals." Rodentia Cricetidae Peromyscus interparietalis Peromyscus seremicus Large NA Gray (1972) #273 NA No data for Peromyscus interparietalis "The Hybrids Subowed heterosis in resolve weight." Rodentia Cricetidae Peromyscus interparietalis Peromyscus miniculanus blandus Large Small Gray (1972) #278 NA No data for Peromyscus leucocephalus "Reciprocal crosses are possible, but difficulties frequently arise at parturition in the smaller P _i to Manage of the hybrid destuate of the hybrid destuates in the second half of peromyscus leucocephalus are peromyscus miniculanus blandus. Rodentia Cricetidae Peromyscus polionotus Peromyscus miniculanus blandus Large Small Dawson (1965), Gray (1972) #281 0.0399 EF423875.1, DQ388827.1 "There is high incidence of maternal feotal death in the second half of pregnancy, and the P _i requestive death of the hybrid destuates bears the search of the hybrid destuates the search of the hybrid destuates bears the search of the hybrid destuates the									domestic guinnea pig."
Rodentia Criceitidae Mesoricetisa unrus Mesoricetis nevtoni Large NA Gray (1972) #249 0.1509* J06874011, J0927412.1 "A male and female hybrid obtained in Teheran were particularly large and viscorous animals." Rodentia Criceitidae Peromyscus interparietalis Peromyscus interparietalis Peromyscus interparietalis Peromyscus interparietalis Peromyscus interparietalis "Reciproal crosses are possible, but difficulties frequently arise at parturition in the smaller PL (and the first peromyscus interparietalis "Reciproal crosses are possible, but difficulties frequently arise at parturition in the smaller PL (and the first peromyscus leucocephalus Peromyscus leucocephalus Peromyscus leucocephalus Peromyscus leucocephalus Peromyscus politonotus Peromyscus politonotus Peromyscus politonotus Peromyscus politonotus Peromyscus miniculatus blandus Peromyscus miniculatus Peromyscus politonotus Peromyscus politonotus Peromyscus politonotus Peromyscus politonotus Peromyscus miniculatus Peromyscus miniculatus Peromyscus politonotus P	Rodentia	Cricetidae	Clethrionomys rutilus	Clethrionomys glareolus glareolus	Large NA	Grav (1972) #244	0.0818	AB031581.1. DO472348.1	
Rodentia Criceitiae Mesocricetus newtoni Large NA Gray (1972) #254 0.1168 AB29035.11, AJ97338.1.1 "Litter size was much smaller than in the parentla species, but the hybrids showed heterosis in robody weight." Rodentia Criceitiae Peromyscus interparietalis Peromyscus interparietalis Peromyscus interparietalis (Criceitiae Peromyscus interparietalis Peromyscus maniculatus blandus Large NA Gray (1972) #273 NA No data for Peromyscus leucocephalus (Peromyscus leucocephalus Peromyscus leucocephalus Peromyscus leucocephalus Peromyscus leucocephalus (Peromyscus leucocephalus Peromyscus leucocephalus Peromyscus leucocephalus (Peromyscus leucocephalus Peromyscus leucocephalus (Peromyscus leucocephalus Peromyscus leucocephalus (Peromyscus leucoce						Gray (1972) #249			
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Rodentia Cricetidae Peromyscus maniculatus Peromyscus maniculatus Large Small Dawson (1965), Gray (1972) #281 0.0399 EF423875.1, DQ388827.1 Rodentia Cricetidae Peromyscus polinonus Peromyscus maniculatus Large Small Dawson (1965), Gray (1972) #281 0.0399 EF423875.1, DQ388827.1 Rodentia Cricetidae Phodopus sungorus Phodopus sungorus Phodopus campbelli Large Intermediate/Small Sokolov (1993) this study 0.0371 KF673394.1, K									
Rodentia Criceidae Peromyscus polinontus Peromyscus maniculatus Large Small Dawson (1965), Gray (1972) #281 0.0399 EF423875.1, DQ385827.1 "There is high incidence of maternal feotal death in the second half of pregnance, and the P _T frequently die at parturition owing to the unusually large size of the hybrid fortesters. The smaller of the hybrid fortesters. The smaller of the hybrid fortesters is the supplier of the hybrid fortesters. The smaller of the hybrid fortesters of the hybrid fortesters. The smaller of the hybrid fortesters of the hybrid fortesters of the hybrid fortesters. The smaller of the hybrid fortesters of the hybrid fortesters of the hybrid fortesters of the hybrid fortesters of the hybrid societies (P. maniculatus) bears the Pare Phirds weight of the polinontus) bears the Pare Phirds weight of the polinontus bears the larger hybrids weight of the polinontus bears the Pare Phirds weight of the polinontus bears the Pare Phirds weight of the state of the polinontus bears the Pare Phirds weight of the Pare Phirds weight of the polinontus bears the Pare Phirds weight of the Par	couciitia	Cricetidae	r eromyscus ieucocepnatus	r eromyscus maniculalus bianaus	Large Sman	Glay (1972) #276	INA	No data for Feromyscus teucocepnatus	
Frequently die at parturition owing to the unusually large size of the hybrid focuses. The smaller of the hybrid focuses.									
Rodentia Criceidae Muridae Companius Acomys dimidatus Acomys minous Large Small Gray (1972) #299 0.0838 AJ2339991, GU0465531.	Rodentia	Cricetidae	Peromyscus polionotus	Peromyscus maniculatus	Large Small	Dawson (1965), Gray (1972) #281	0.0399	EF423875.1, DQ385827.1	" There is high incidence of maternal feotal death in the second half of pregnancy, and the P. poilionotus females
Rodentia Criceidae Muridae Companius Acomys dimidatus Acomys minous Large Small Gray (1972) #299 0.0838 AJ2339991, GU0465531.					- 5	(, ,		,	
Rodentia Cricetidae Phodopus sungorus Phodopus campbelli Large Intermediate/Small Sokolov (1993) (this study 0.0371 KF673394.1, KF673394.1, KF673395.1 Pe. x. Ps. bybrids weigh 29g as do the parents, while Ps. x. Pe. bybrids weigh 55g - Table 2, row Rodentia Muridae Acomys dimidiatus Acomys minous Large Small Gray (1972) #299 0.0838 AJ233995.1, GU046553.1 The bybrids weighed less at birth and showed less rapid growth than the parental species. [in the									
body weights (in russian) Rodentia Muridae Acomys dimidiatus Acomys minous Large Small Gray (1972) #299 0.0838 AJ233959.1, GU046553.1 "The hybrids weighed less at birth and showed less rapid growth than the parental species. [in the									
Rodentia Muridae Acomys dimidiatus Acomys minous Large Small Gray (1972) #299 0.0838 AJ233959.1, GU046553.1 "The hybrids weighed less at birth and showed less rapid growth than the parental species, [in the	Codentia	Cricetidae	Phodopus sungorus	Phodopus campbelli	Large Intermediate/Small	Sokolov (1993)/this study	0.0371	KF673394.1, KF673395.1	P.c. x P.s. hybrids weigh 29g as do the parents, while P.s. x P.c. hybrids weigh 55g - Table 2, row 2 in Sokolov (1993) is
Rodentia Muridae Acomys dimidiatus Acomys minous Large Small Gray (1972) #299 0.0838 AJ233959.1, GU046553.1 "The hybrids weighed less at birth and showed less rapid growth than the parental species, [in the									hody weights (in russian)
	Ondantia	Muridaa	Acomy dimidiatus	Acomy minous	Large Small	Grav (1972) #200	0.0838	A 1222050 1 CH046552 1	
	coucinia	withing	леотуз иннишииз	Acomys minous	Large Small	Glay (1972) #299	0.0030	A3233737.1, GOO40333.1	
									large size of the hybrid embryos tended to result in deficiencies at or before parturition. The post-natal growth of the
hybrids was more rapid than in the parental species."									hybrids was more rapid than in the parental species."
	≷odentia	Muridae	Mus spretus	Mus musculus	Large Small	Zechner (1996)	0.0963	AB033700 1 AC 000026 1	"increased placental size occurred in a (spr x mus) cross The opposite phenotype, decreased placental size, was
observed in (mus x spr) and (mus x mac) erosses"									
	Codentia	Muridae	Mus macidonicus	Mus musculus	Large Small	Zechner (1996)	0.0686	AY057808.1, AC_000026.1	"increased placental size occurred in a (spr x mus) cross The opposite phenotype, decreased placental size, was
observed in (mus x spr) and (mus x mac) crosses The occurrence of abnormally sized placen					*			-	observed in (mus x spr) and (mus x mac) crosses The occurrence of abnormally sized placenta weight in the mac
crosses followed exactly the same pattern as the spr crosses"									
	0 - 1	M. Chin		W	Y NIA	7 - 1 (1006)	NIA	No los Colleges	"When the (mus x spi) F1 females were backcrossed with mus males, enlarged placentas were again observed"
Rodentia Muridae Mus specilegus Mus musculus Large NA Zechner (1996) NA No data for Mus specilegus "When the (mus x spi) F1 females were backerossed with mus males, enlarged placentas were a	cogentia	rviuridae	mus specilegus	Mus musculus	Large NA	Zecnner (1996)	NA	No data for Mus specilegus	which the (mito x spr) 1 1 rentates were backerossed with mits mates, emarged placemas were again observed

Silent Nucleotide

Note: many taxanomic names have changed since Gray published in 1972. Here we report the same names as Grey (1972) with current names in parentheses
* To calculate Dxy, we aligned all sequences and trimmed the alignment to the 718 bases shared across most of the species. The single asterisk (7) undicates species pairs that had fewer than 718 bases in this trimmed alignment and indicates that these may not be directly comparable to the others.
** Low genetic diveragence between polar bears and grazity bears represents recent mitochondrial introgression and may not be indicate to fit the genome-wide divergence (Miller et al., 2012).

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Allen, W. R. 1979. Factors influencing pregnant mare serum gonadotrophin production. Nature 223:64–66.
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Dawson, W. D. 1965. Fertility and size inheritance in a Peromyscus species cross. Evolution 19:44–55.
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Zechner, U., et al. 1996. An X-chromosome linked locus contributes to abnormal placental development in mouse interspecific hybrids. Nature Genet. 12-398–403.

Table S2: PCR Primer Sequences and Reaction Conditions

Primer Name	Sequence 5' to 3'	Melting Temp (7	Tm) GenBank accession numbers or USCS gene IDs/genome builds used to design these primer pairs
CytB Forward	CCWGCCCCATCAAAYATYTC	60	
CytB Reverse	ACTGGTTGNCCTCCRATTCA	60	UCSC: uc009kob.1_mm9, m4
Grb10 Forward	GCCTTCAGGAGGAAGACCA	55	
Grb10 Reverse	CATGGAACCARTGCTGNTC	55	UCSC: NM_001001555_hg18, mm9, rn4, cavPor2
H19 Forward	GACATGGTCCGGTGTGAYG	55	
H19 Reverse	CTGGTGRGGAGGGCAAA	55	UCSC: uc009kob.1_mm9, hg19, rn4
Igf2 Forward	TGGGGAAGTCGATGTTGG	55	
Igf2 Reverse	CGYTTGGCCTCTCTGAACKC	55	UCSC: uc009kod.1_mm9, hg19, m4, cavPor3
Igf2r Forward	ACCACGAGTGGGGCTTCT	59	
Igf2r Reverse	GCCACCAGGAGNAGRCTGAG	59	UCSC: uc008aky.1_mm9, hg18, rn4, cavPor2
Mash2 Forward	GAGCGCAACCGCGTRAAG	57	
Mash2 Reverse	TCAGTAGCCCCCTAACCARCTG	57	UCSC: uc009koj.1_mm9, hg18, rn4, cavPor2
Mest Forward	GAGRGAGTGGTGGGTCCARG	56	
Mest Reverse	AAGGAGTTGATGAAGCCCATA	56	UCSC: uc009bfu.1_mm9, hg18, cavPor2
Peg3 Forward	TGTGGACAGGCTTCATTCA	55	
Peg3 Reverse	TGTGAGAATTCTGGTGTCTGG	55	UCSC: NM_001146186_mm9, hg18, rn4, cavPor2
Snrpn Forward	TGTGGGTAAGAGTAGCAAGATGC	55	
Snrpn Reverse	GTCTTGGTGGRCGCATTC	55	UCSC: NM_022807_mm9, m4
Zfx Forward*	CAAAWCATGCAAGGRTAGAC	60	
Zfx Reverse*	AGACCTGATTCCAGGCAGTACCA	60	GenBank: X75172.1, X75171.1, NM_001044386.1, AY012058.1, M74776.1, AY012055.1
Grb10_qpcr_Gen_F	CAGGTGAAGGAAGTTGGAAG	60	
Grb10_qpcr_Gen_R	GGACTTTGTCCACGAAGGAA	60	GenBank: JX217835.1, JX217834.1
H19_qpcr_F1	TGGTCTCTCAAGCAAAGAA	60	
H19_qpcr_R1	CGTCATCTCCCTCCTGTCTT	60	GenBank: JX217837.1, JX217836.1
Igf2_qpcr_F1	GAGGCATCGTGGAAGAGTG	60	
Igf2_qpc_R1	ACACGTCCCTCTCGGACTT	60	GenBank: JX217838.1, JX217839.1
Igf2r_qpcr_F2	AATGACCAGCACTTCAGCAG	60	
Igf2r_qpcr_R2	TGGAAGAAGATGGTGGTAGA	60	GenBank: JX 217841.1, JX217840.1
Mash2_qpcr_F2	CGTTATCTCCTCCGCCAGT	60	
Mash2_qpcr_R2	CACCGGACTCAGCTCTCC	60	GenBank: JX217843.1, JX217842.1
Mest_qpcr_F1	GCTTTGGCTTCAGTGACAAA	60	
Mest_qpcr_R1	TGATTCTGCGGTTCTGTAGC	60	GenBank: JX217845.1, JX217844.1
Peg3_qpcr_F1	CAGATGGAGAAGCTGCTGAG	60	
Peg3_qpcr_R2	CTTTTCTGGGTCTTCGATCC	60	GenBank: JX217847.1, JX217846.1
Snrpn_qpcr_F1	GGAGGGTCCACCTCCTAAAG	60	
Snrpn_qpcr_R1	GGACAGGACCTGCTAATCCA	60	GenBank: JX217849.1, JX217848.1
Ywhaz_qpcr_F1	GCCTGCTCTCTTGCAAAAAC	60	
Ywhaz qpcr R2	ATTTTCCCCTCCTTCTCCTG	60	CHO-K1 (GCA_000223135.1)

PCR reaction conditions: 2min at 94c, 30x(15sec at 94c, 15sec at Tm, 60sec at 72c), 60sec at 72c, hold at 10c qPCR reaction conditions: 10min at 95c, 40x(30sec at 95c, 15sec at Tm, 15sec at 72c), 11min at 95c, 30sec at 55c, 30sec at 95c

Shaw, C. N., P. J. Wilson, and B. N. White. 2003. A reliable molecular method of gender determination for mammals. J. Mammal. 84:123–128.

^{*}This primer pair is similar to LGL331 and LGL335 from Shaw (2003) but have some slight modifications that result in them not amplifying Zfy in hamsters. We have therefore choosen to name them differently despite their similarities and common origin.