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Supplementary Material

The tammar wallaby: a non-traditional animal model to study growth axis maturation

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Table S1. Growth alterations resulting from genetic disruptions in growth factors

Gene	Function	Deficiency	Reference
GH	Stimulates post natal growth	Excess of birth weight relative to length; progressive postnatal growth failure; slow muscle development, and altered body composition	Gluckman *et al*. 1992
GHR	Regulates GH actions in target tissues	Short stature, truncal obesity; low plasma IGF1; elevated serum GH; absent, low, or dysfunctional serum GH binding protein (GHBP); and resistance to GH	Laron 1993; Zhou *et al*. 1997
IGF1	Stimulates pre and post natal tissue growth	Severe intrauterine and postnatal growth retardation; perinatal lethality; developmental defects in bone and muscle; increased serum GH levels, increased weight of kidney, heart, liver, and brain	Liu *et al*. 1993; Woods *et al*. 1996; Liu and LeRoith 1999
IGF2	Stimulates prenatal growth	Intrauterine growth restriction	DeChiara *et al*. 1990; Baker *et al*. 1993
IGFALS	Increases half life and controls IGF1 bioavailability in adults Forms a ternary complex with IGFBP3	No effects on survival rates and birth weights, but postnatal growth deficiency and reduction	Ueki *et al*. 2000; Domené *et al*. 2004

		in IGF1 and IGFBP3 plasma concentration	
IGFBP3	One of the major carrying protein for IGF1 and IGF2 in circulation, also modulator of IGFs bioactivity	No effects on circulating IGF1	Lofqvist *et al*. 2007
IGFBP2	One of the principal binding proteins for IGF1 and IGF2 during development, controls bioactivity IGFs, widely expressed in fetal tissues	No phenotypic alterations, only reduction in spleen weight 30%	Wood *et al*. 1993; Schneider *et al*. 2000

Table S2. Effect of nutritional environment on growth factors during fetal and early post-natal life

Gene	Under-nutrition	Over-nutrition	Species	Reference
GH	Higher concentration plasma. GH resistance.	Decreased plasma concentrations	Human, sheep,	Bauer *et al*. 1995; Albertsson-Wikland *et al*. 1997; Yasunaga *et al.* 1998
GHR	Decreased hepatic abundance (in severe nutritional restriction). Reduction GH specific binding	Increased hepatic abundance and GH specific binding	Rat, sheep	Woodall *et al*. 1996; Rhoads *et al*. 2000a; Hyatt *et al*. 2004; Hyatt *et al*. 2007
IGF1	Decreased local expression, decreased hepatic expression and plasma concentration	Increased hepatic abundance and plasma concentration	Rat, sheep and mice	Oliver *et al*. 1993; Muaku *et al*. 1995; Woodall *et al*. 1996; Brameld *et al*. 2000; del Mar Plata *et al*. 2014
IGF2	Increased hepatic abundance	Increased hepatic abundance	Sheep, mice	Brameld *et al*. 2000; del Mar Plata *et al*. 2014
IGFALS	Decreased hepatic abundance (in placental insufficient)	Increased hepatic abundance	Sheep	Rhoads *et al*. 2000a
IGFBP3	Severe nutritional restriction decreased plasma concentration	Fat-enriched diets in neonates increased expression in subcutaneous fat	Human, sheep, guinea pig and pig	Gallaher *et al*. 1998; Carter *et al*. 2005; Verkauskiene *et al*. 2007; Sabin *et al*. 2011
IGFBP2	Increased plasma concentration and hepatic abundance (in severe chronic under-nutrition)	Fat diet in neonate increased expression in muscle	Rat, guinea pig and pig	Kampman *et al*. 1993; Woodall *et al*. 1996; Carter *et al*. 2005; Sabin *et al*. 2011