

01

PLACENTAL MODIFICATIONS SECONDARY TO MATERNAL HYPERGLYCAEMIA RESULTED IN IMPAIRED PREGNANCY OUTCOMES



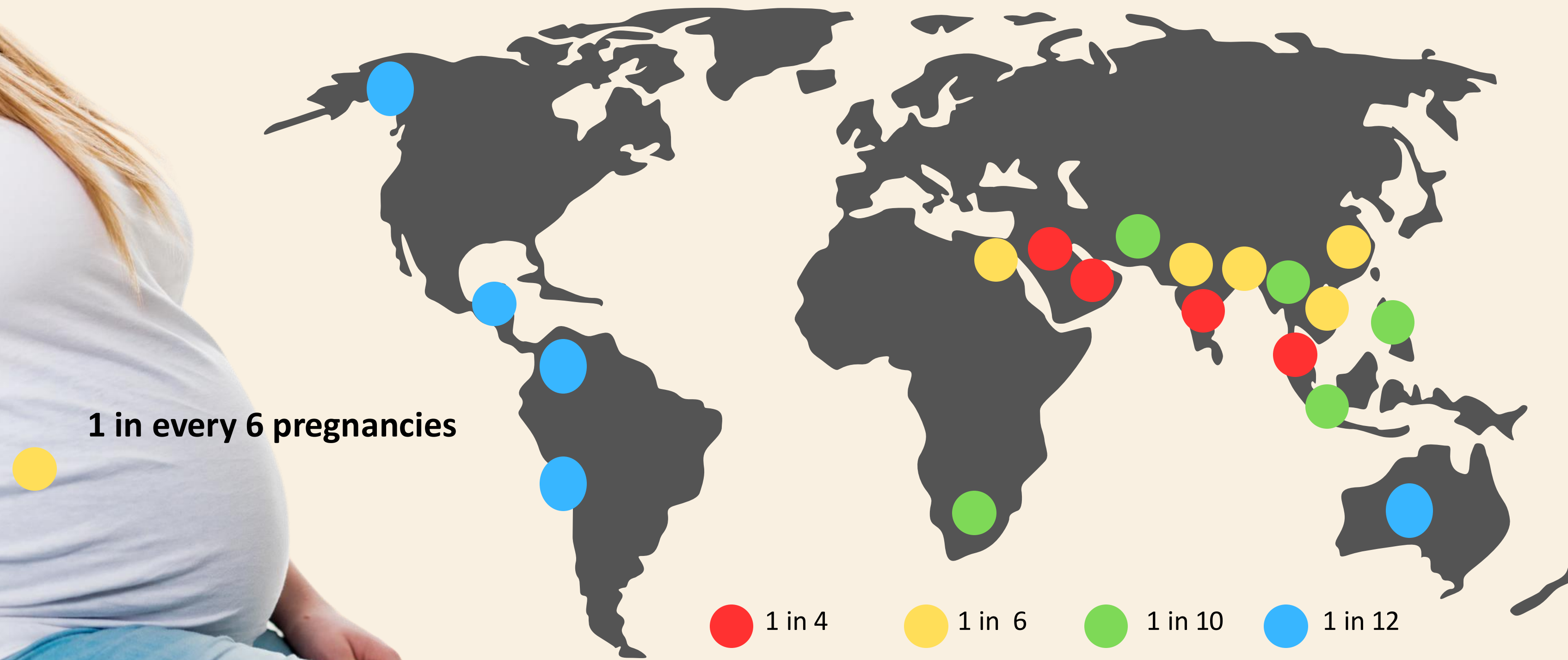
Noor Eliza Hashim, Mardhiah Tahir,
Rasheeda Zamin, *Intan Zulkafli*

Department of Anatomy, Universiti Malaya

The 21st Congress of International
Federation of Associations of Anatomists

02 Introduction

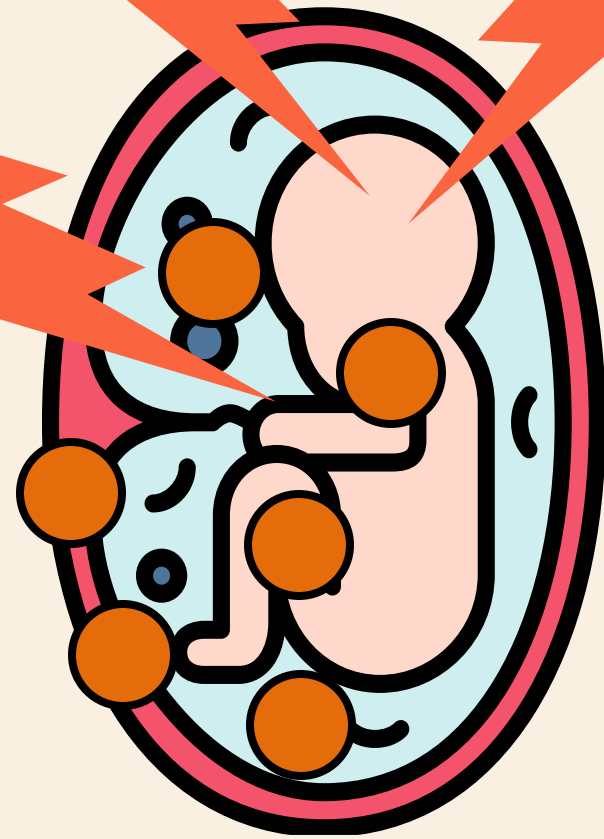
Incidence of maternal hyperglycaemia



03 Introduction

what happened in hyperglycaemia?

Inflammation
Oxidative stress
Placental remodelling?



Maternal complications

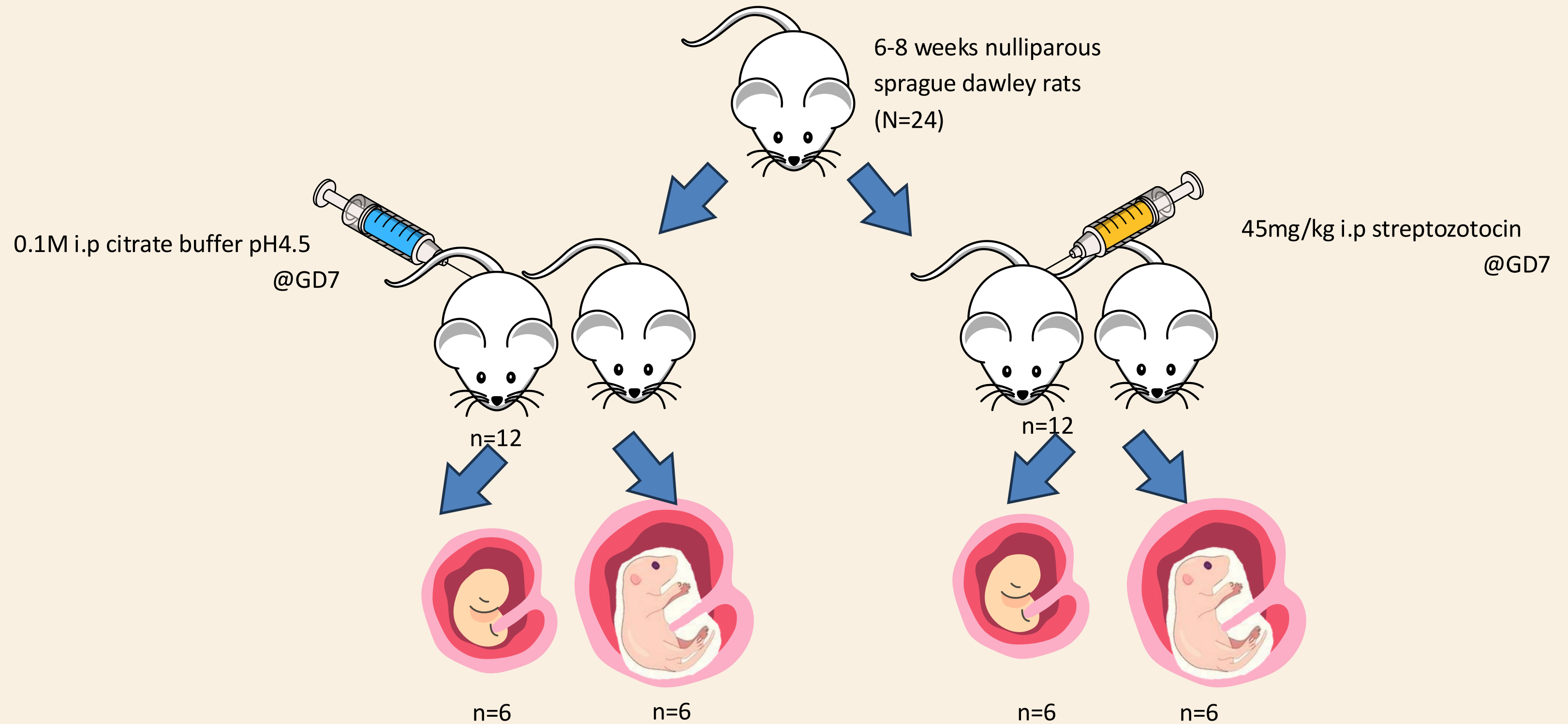


Foetal complications



04 Methodology

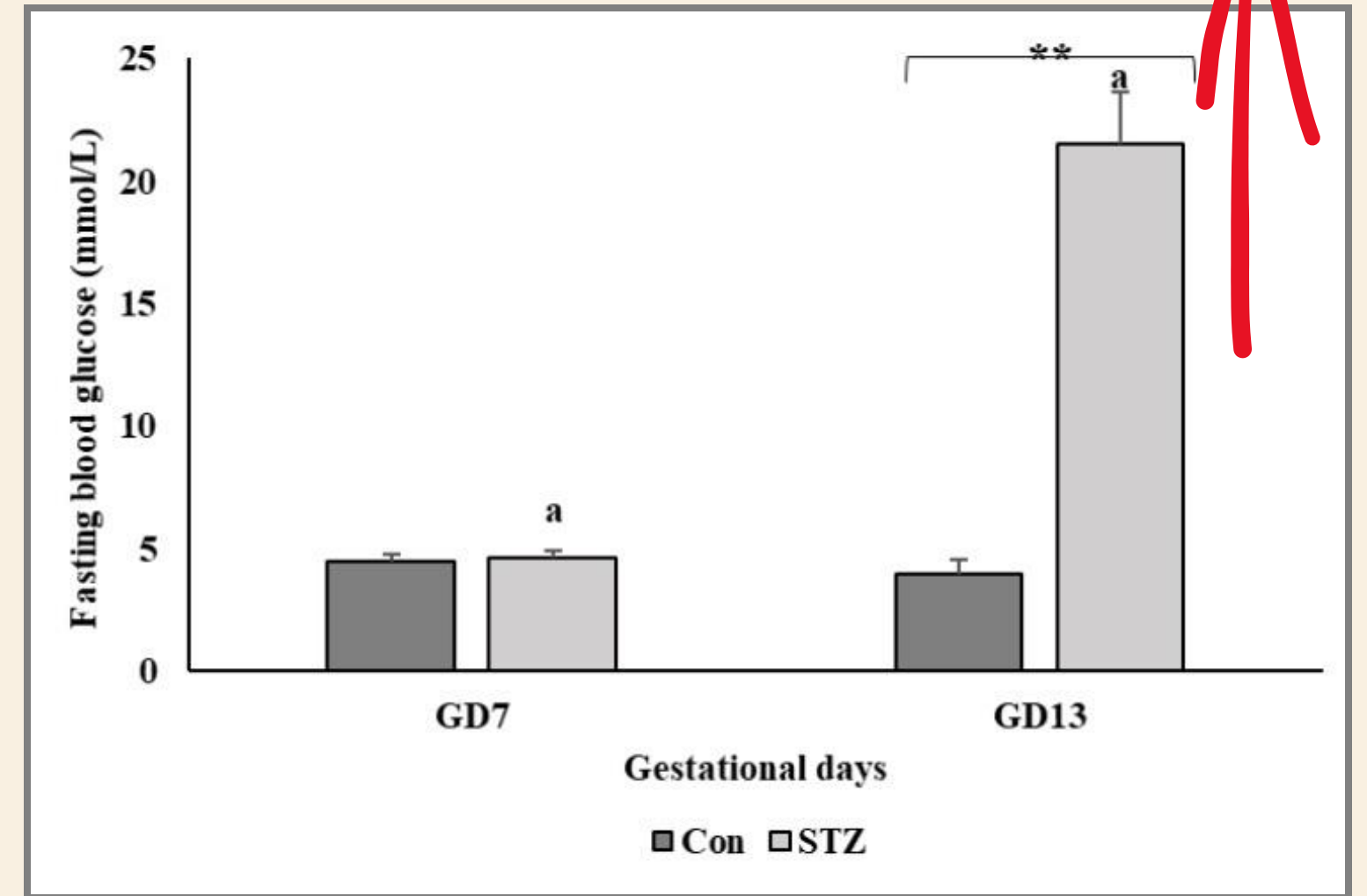
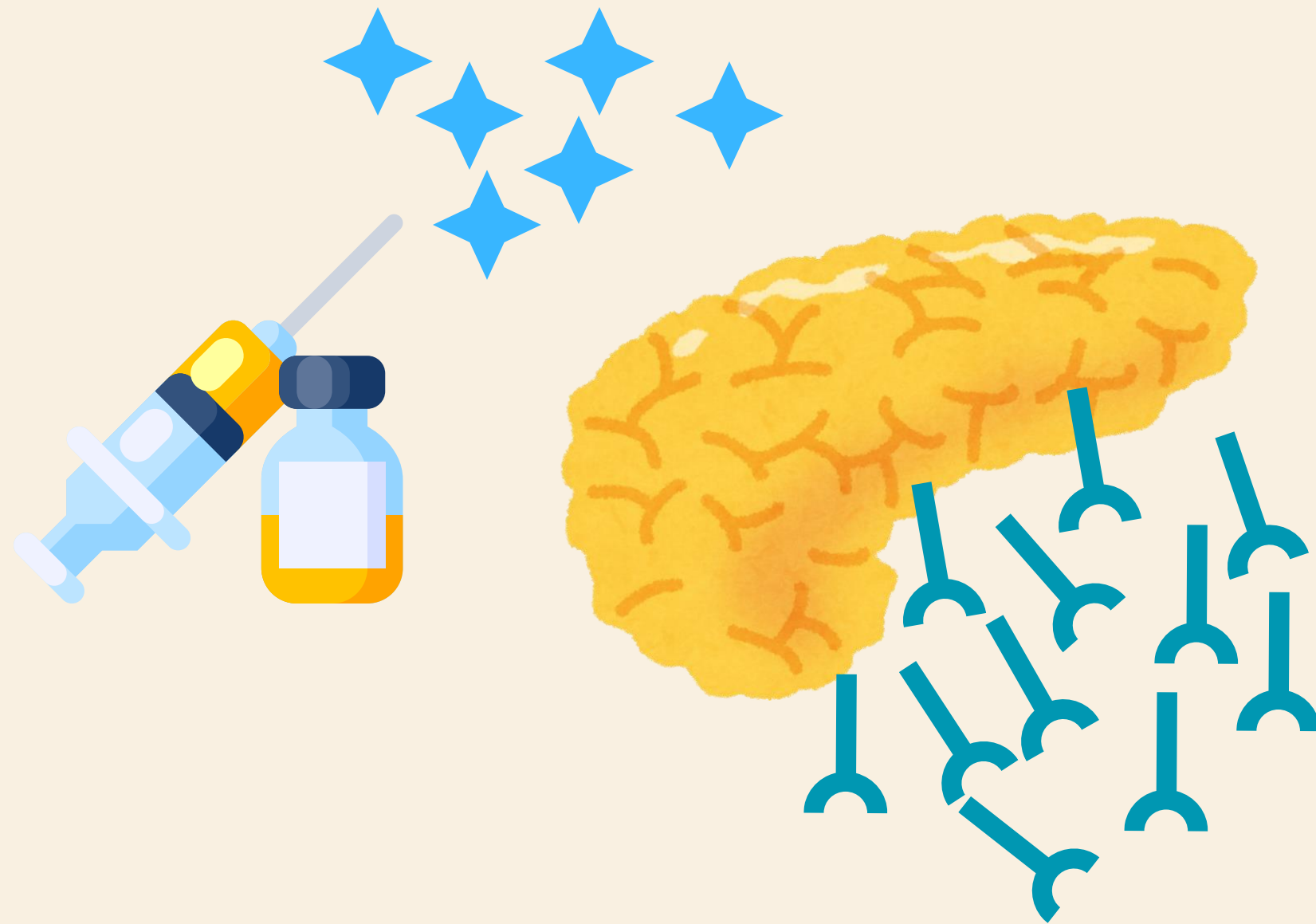
Chemical induced hyperglycaemic pregnancy rat model



05 Results

Model confirmation

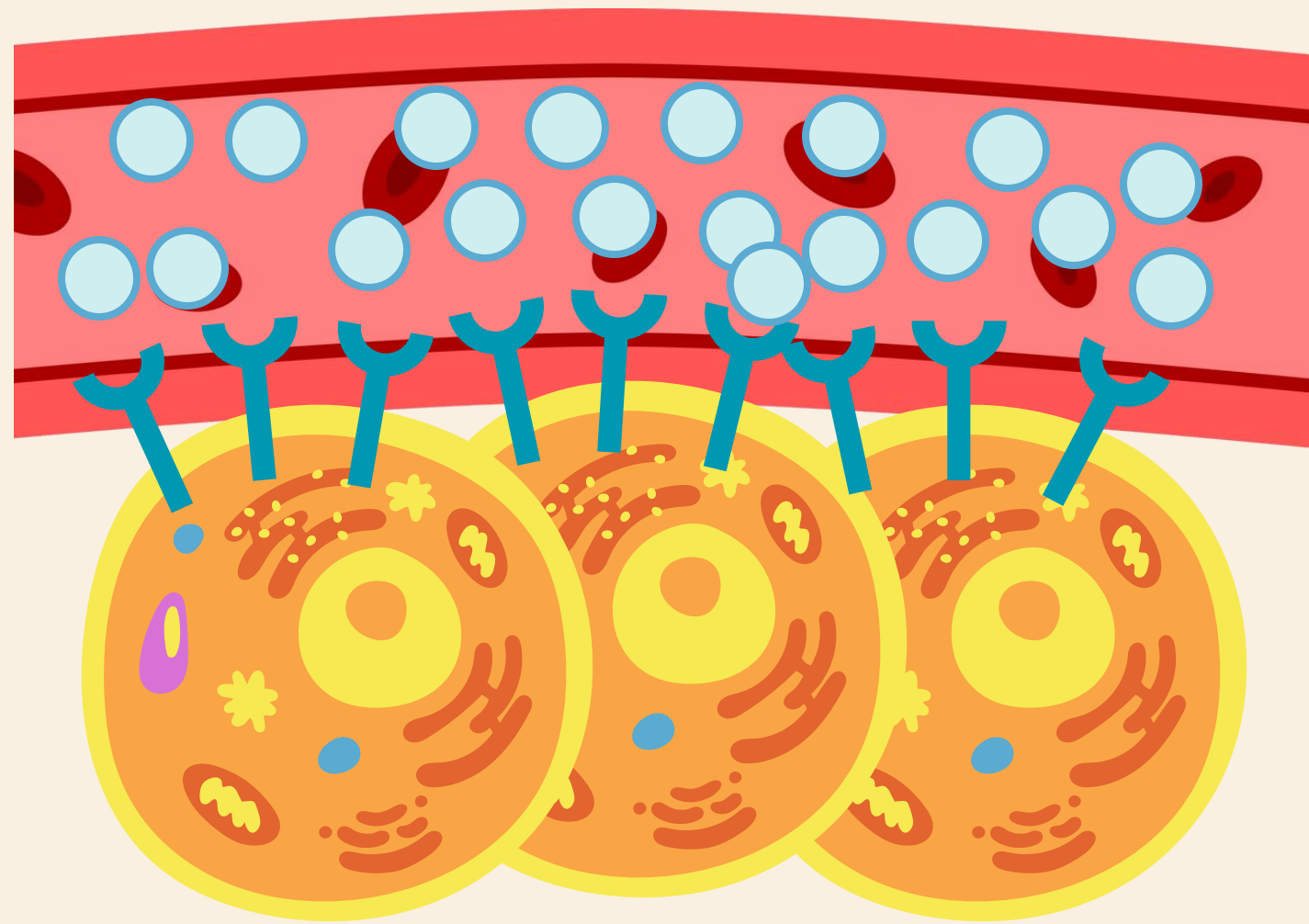
fasting blood glucose



Values are mean (\pm SD) (n=6 per group). * indicates significant difference $p < 0.01$; One-way ANOVA;

06 Results

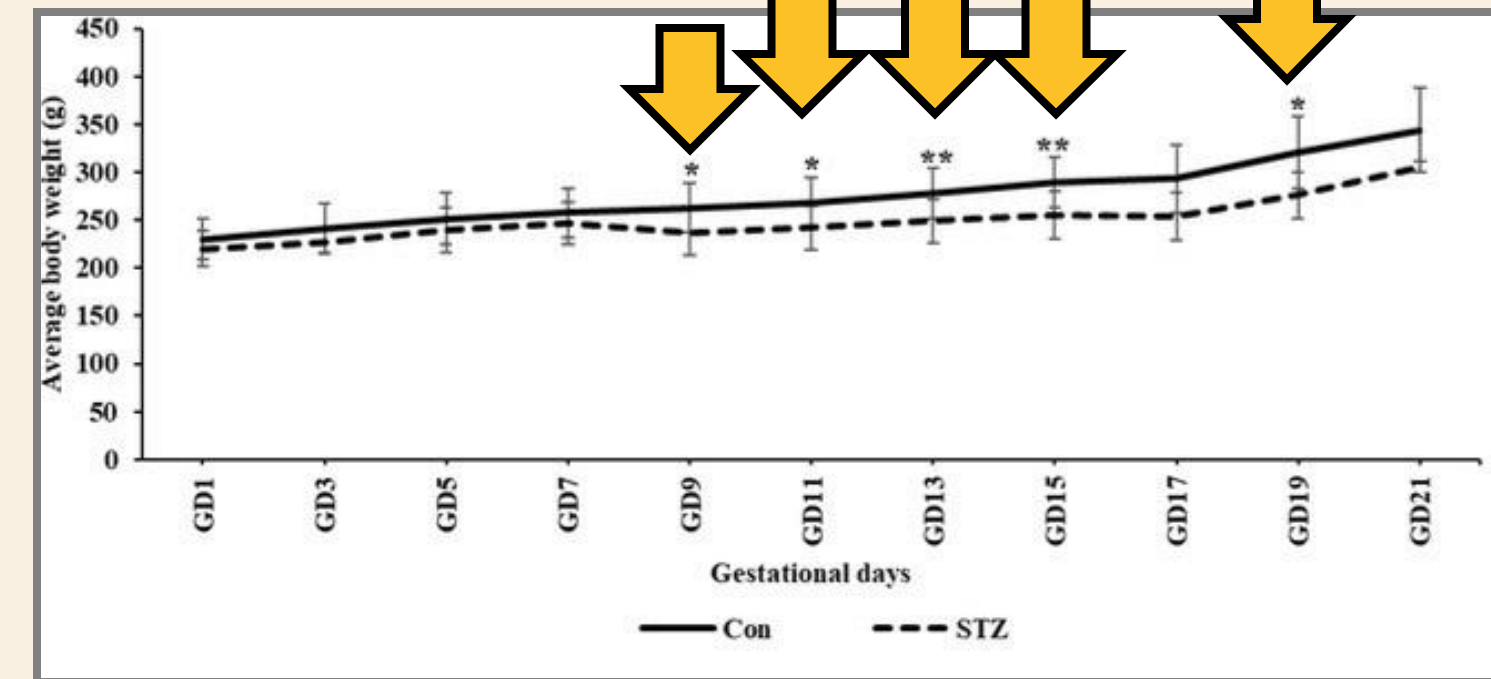
Pregnancy outcomes



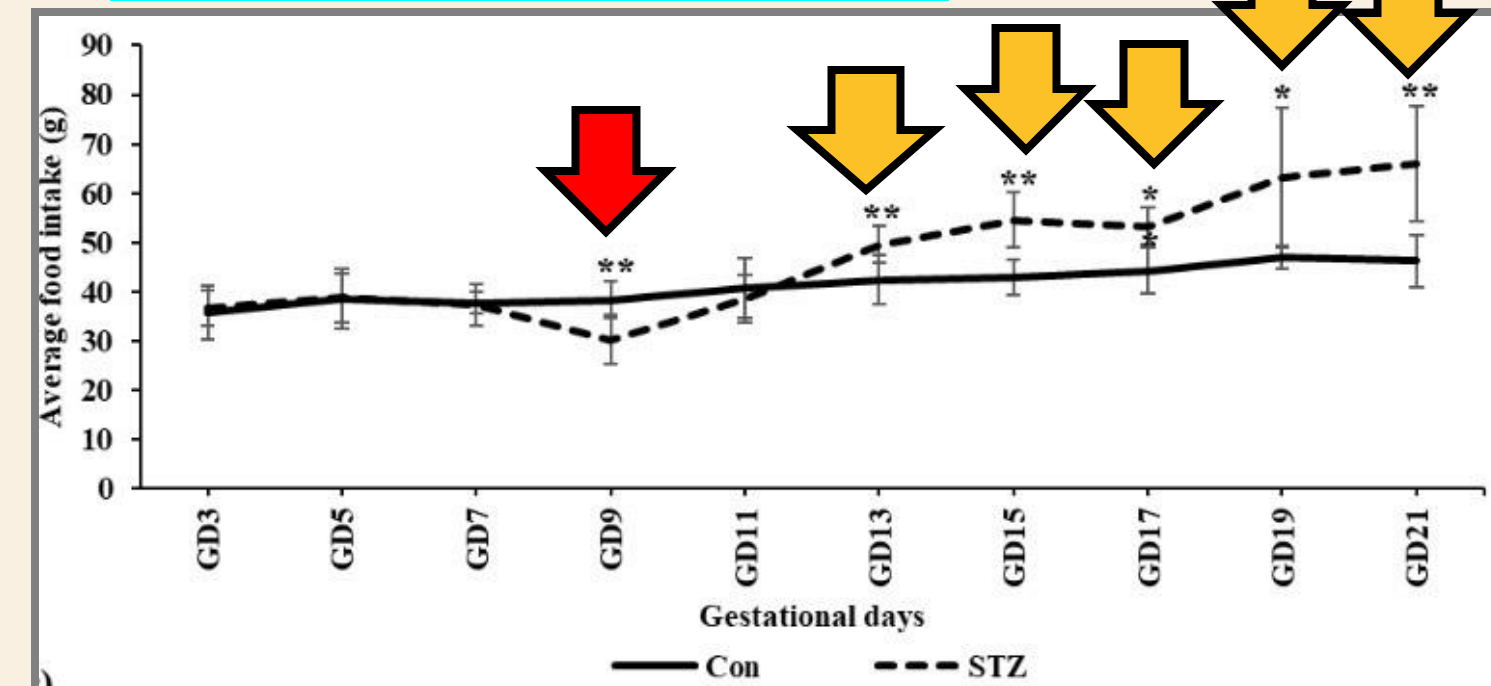
ENERGY

Cellular ~~starvation~~

Average daily weight



Average daily food intake



Daily maternal **body weight & food intake** for the Con and STZ groups.

Values are mean (\pm SD) (n=6 per group). * indicates significant difference $p < 0.05$; Two-way ANOVA, repeated measures;

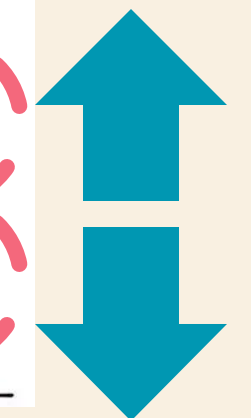
07 Results

Foetal outcomes

Foetal resorptions

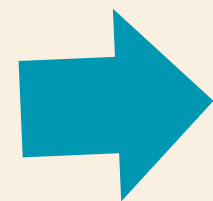
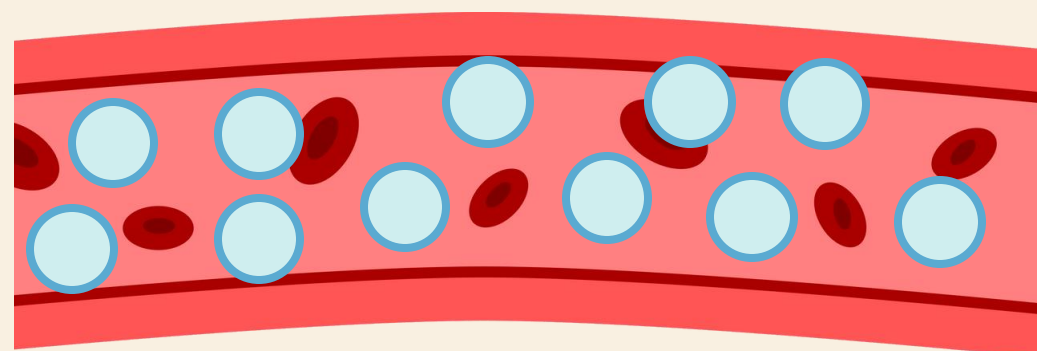
Variable	GD15		GD21	
	Con	STZ	Con	STZ
Number of live foetuses	12.333 (± 1.033)	10.00 (± 2.191)	10.833 (± 0.753)	10.667 (± 2.582)
Foetal resorptions	5.357 (± 8.459)	16.385 (± 17.168)	0.000 (± 0.000) ^a	12.308 (± 15.538) ^a
Foetal BW	0.172 (± 0.019) ^c	0.165 (± 0.055) ^d	4.507 (± 0.619) ^{b,c}	3.447 (± 0.800) ^{b,d}

12 folds



0.25 folds

Values are mean (\pm SD) (n=6 per group). * indicates significant difference $p < 0.05$; One-way ANOVA;



Placental remodelling?

08 Results

Placental outcomes

Placental weight

No changes

Placental volume

No changes

Placental density

No changes

Foeto-placental weight ratio

Table III: Effects of maternal hyperglycaemia on placental weight, volume and density.

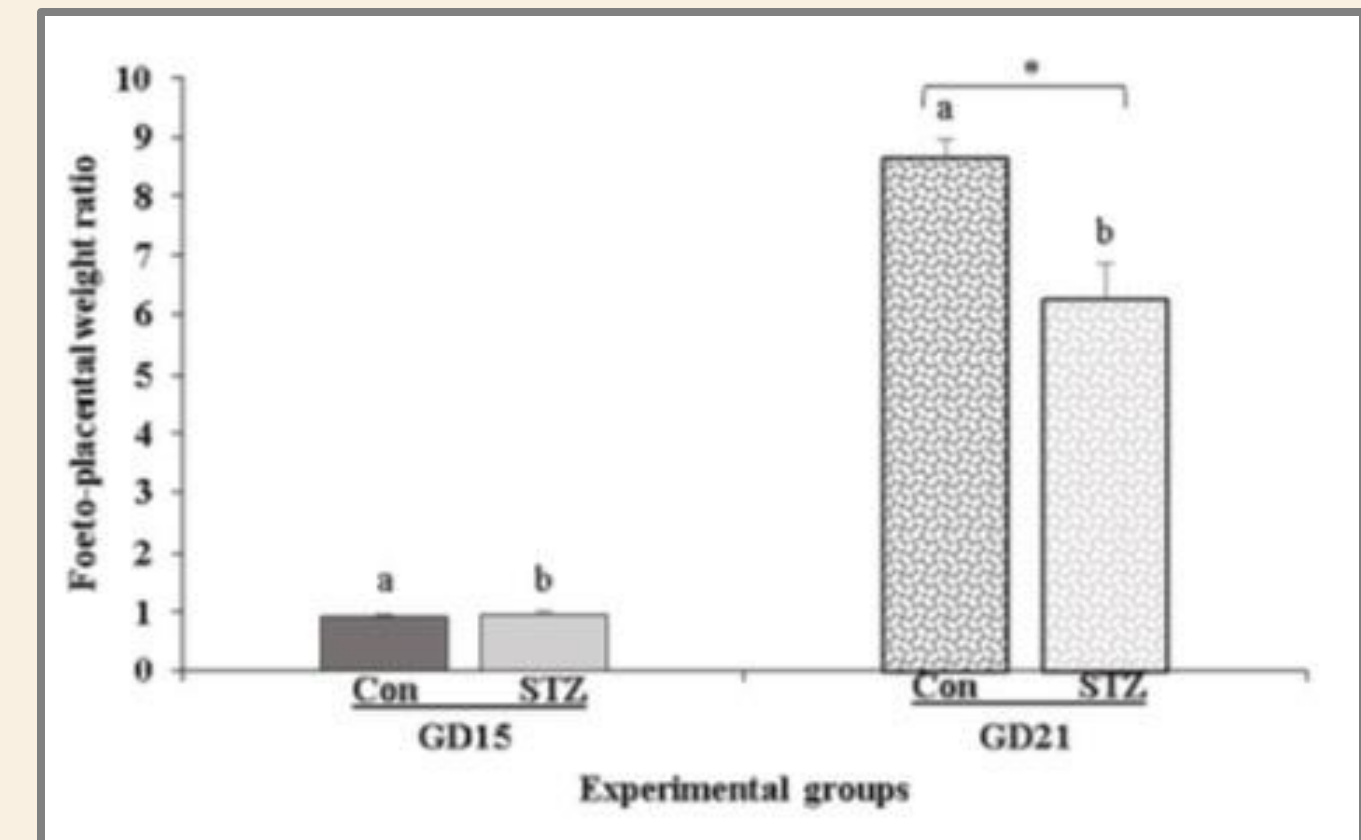
Variable	GD15		GD21	
	Con	STZ	Con	STZ
Weight (g)	0.178 (± 0.025)	0.19 (± 0.048)	0.523 (± 0.021)	0.55 (± 0.112)
Volume (cm ³)	0.123 (± 0.071)	0.213 (± 0.075)	0.364 (± 0.132)	0.492 (± 0.116)
Density (g/cm ³)	2.028 (± 1.533)	0.961 (± 0.402)	1.436 (± 0.632)	1.136 (± 0.195)

Values are mean (\pm SD) (n=6 per group). $p < 0.05$, Two-way ANOVA.

Table IV: Effects of maternal hyperglycaemia on weight and thickness of labyrinth zone (LZ) and junctional zone (JZ).

Variable	GD15				GD21			
	LZ		JZ		LZ		JZ	
	Con	STZ	Con	STZ	Con	STZ	Con	STZ
Weight (g)	0.05 (± 0.01)	0.05 (± 0.01)	0.11 (± 0.02)	0.09 (± 0.02)	0.28 (± 0.02)	0.30 (± 0.04)	0.17 (± 0.03)	0.18 (± 0.03)
Thickness (mm)	0.92 (± 0.19)	0.88 (± 0.13)	0.53 (± 0.07)	0.60 (± 0.18)	2.30 (± 0.35)	1.79 (± 0.75)	0.54 (± 0.06)	0.75 (± 0.27)

Values are mean (\pm SD) (n=6 per group). $p < 0.05$, Two-way ANOVA.



Larger placentas
smaller fetuses

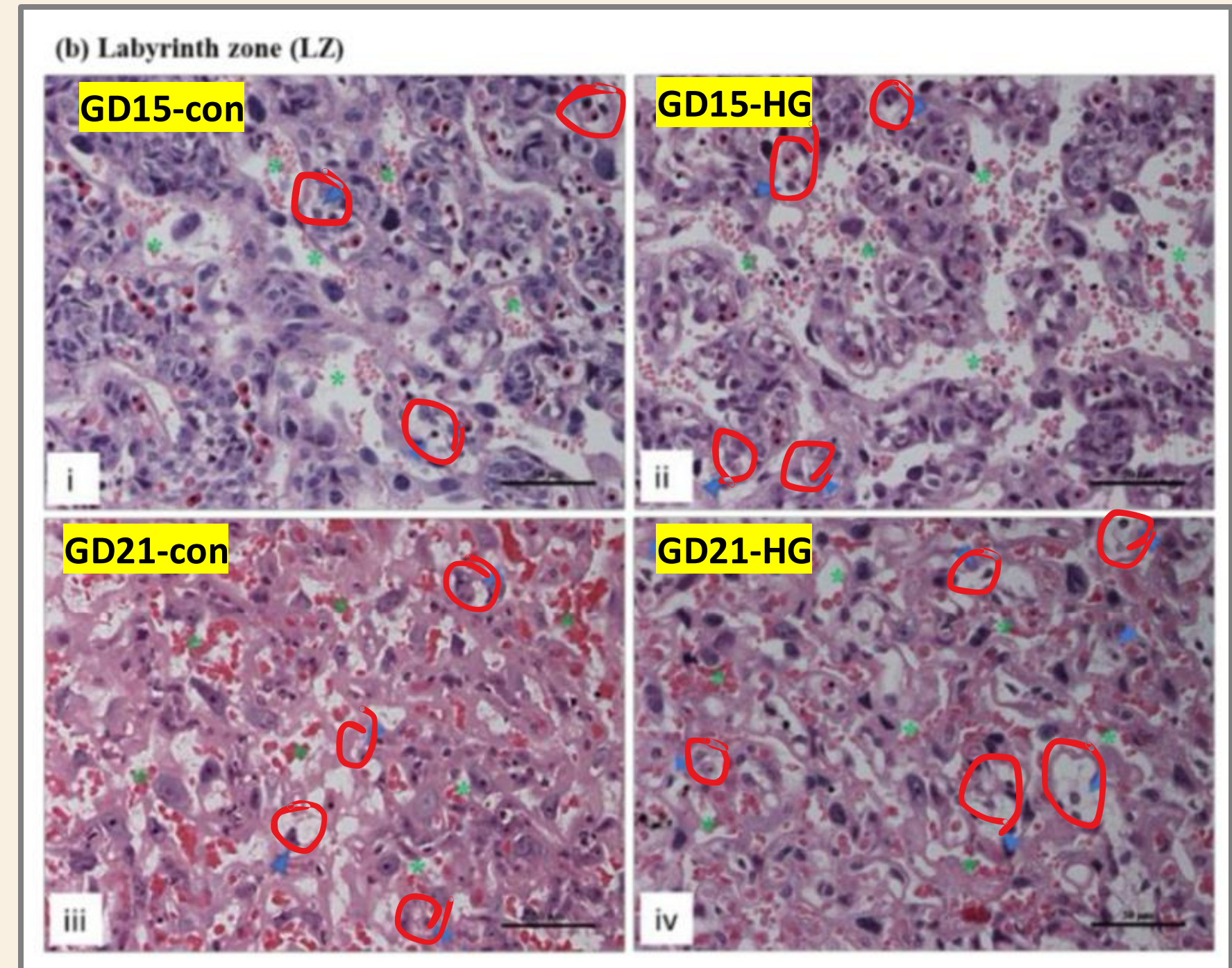
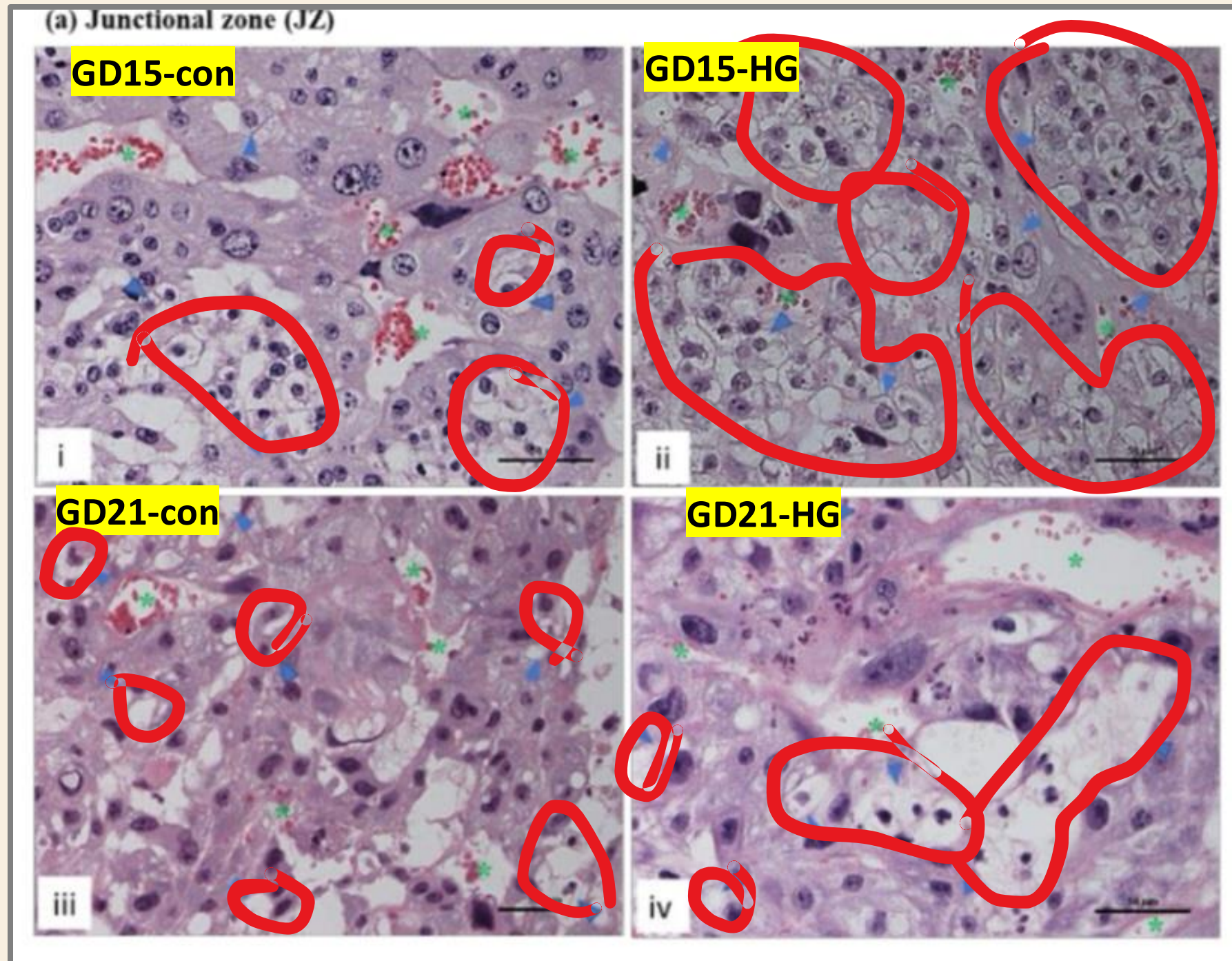
↓ Placental

09 Results

Placental outcomes

what type of placental remodeling?

Glycogen cell deposition

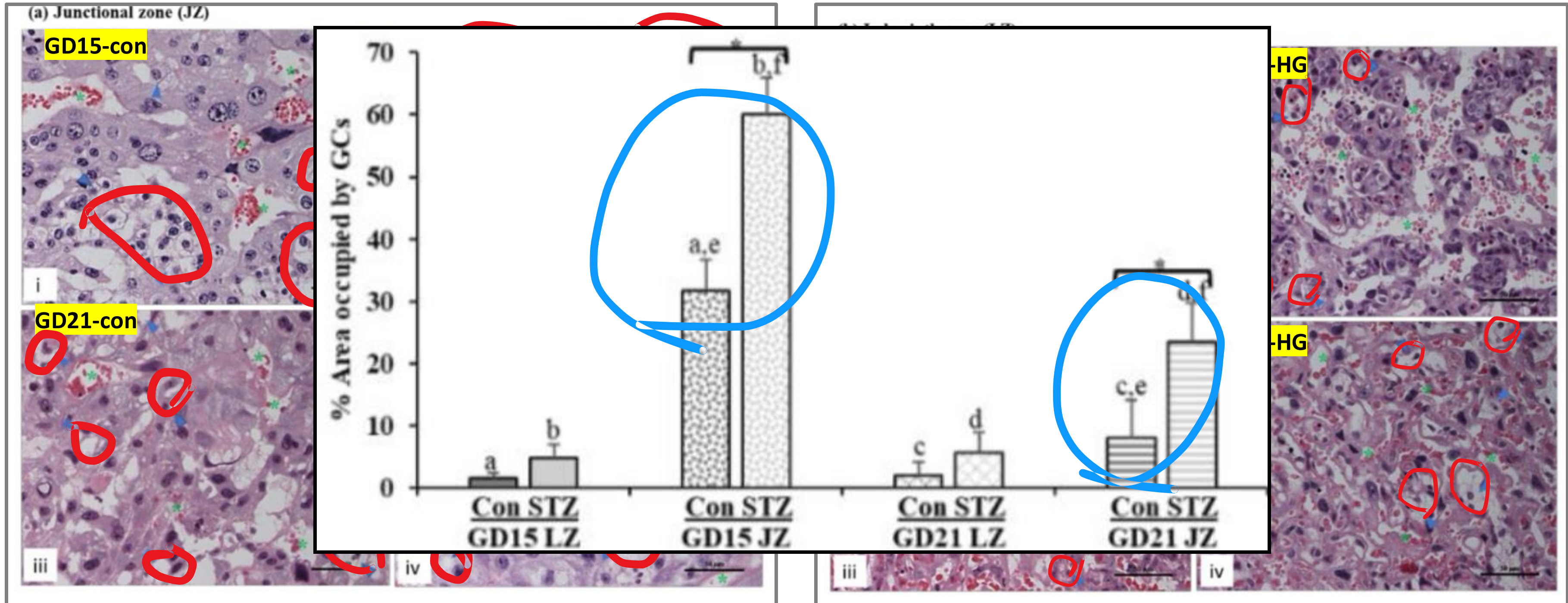


09 Results

Placental outcomes

what type of placental remodeling?

Glycogen cell deposition

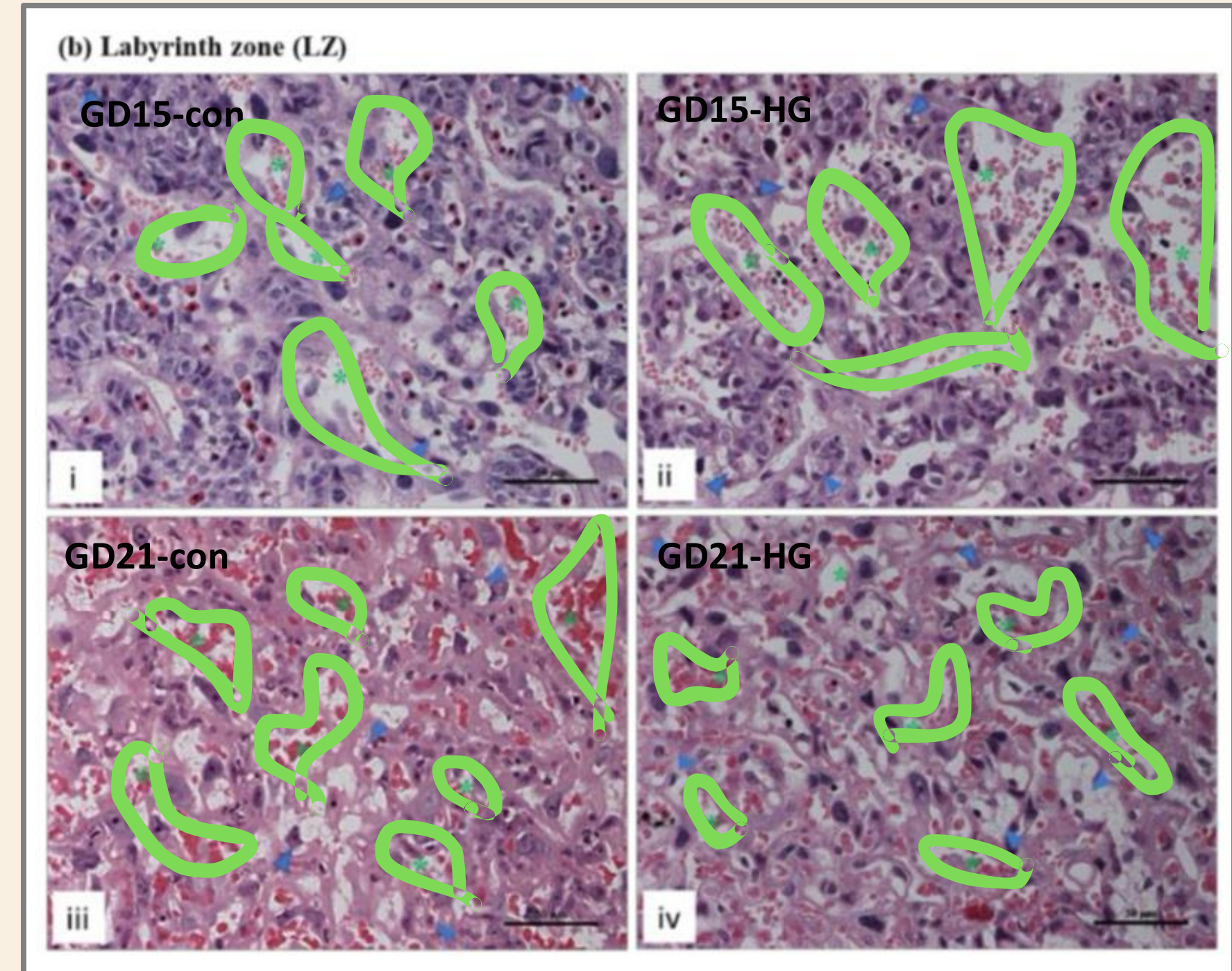
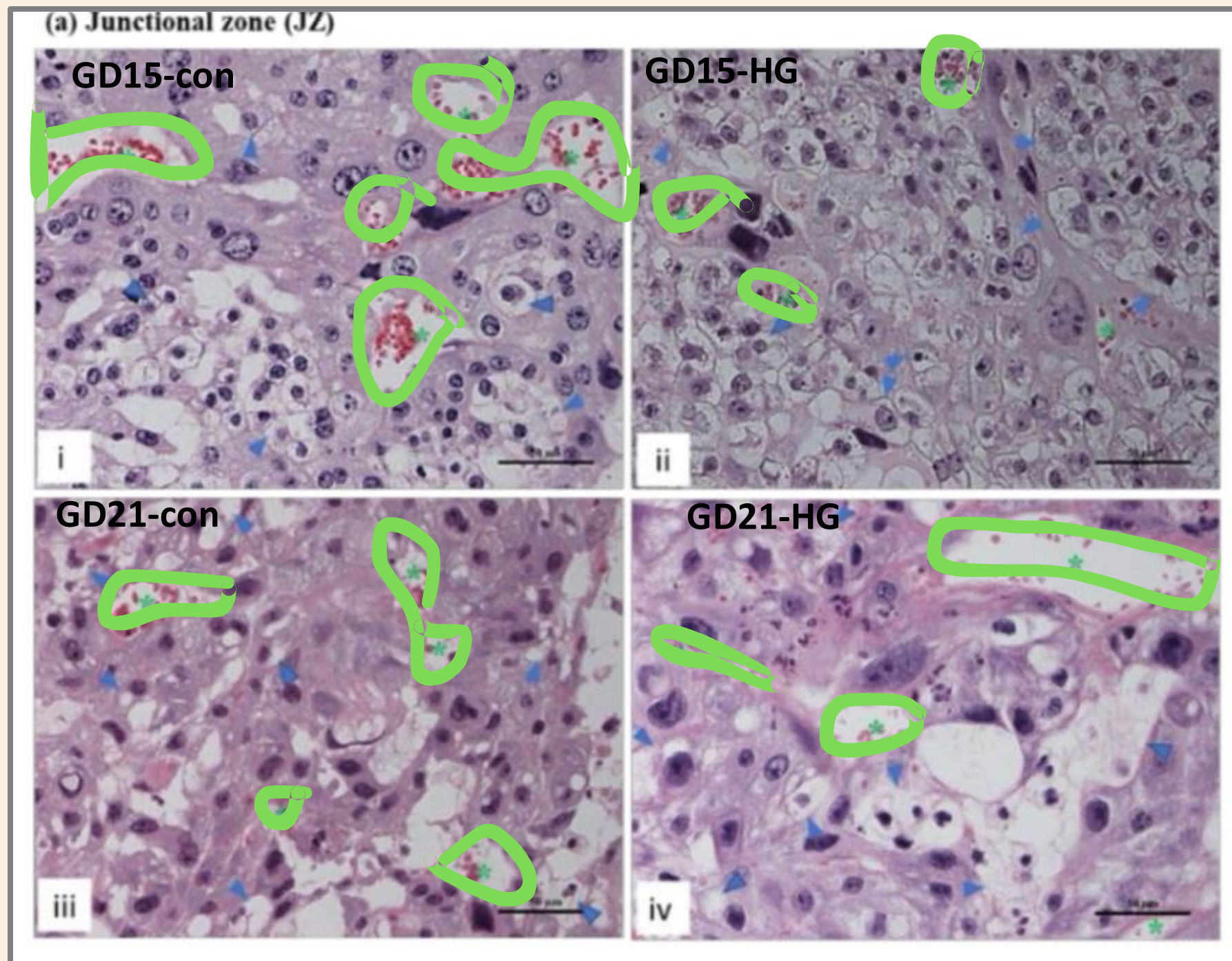


10 Results

Placental outcomes

what type of placental remodeling?

Maternal vascular space



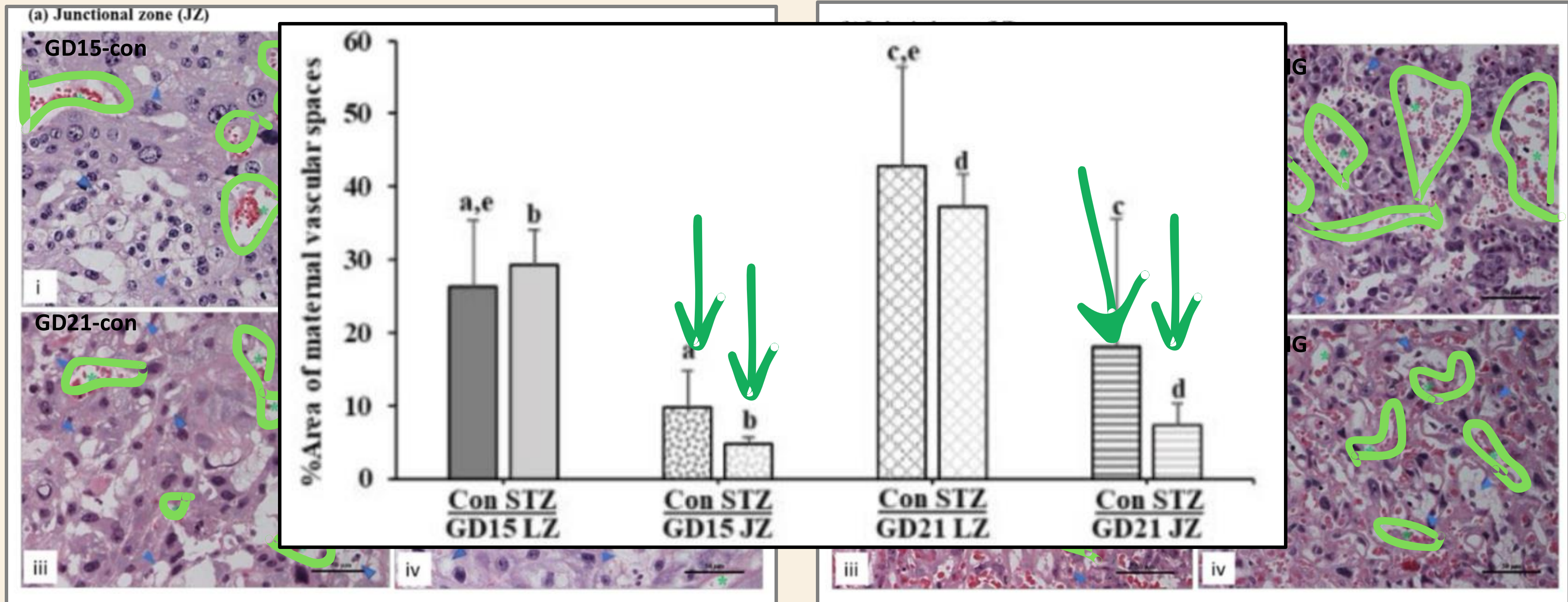
10 Results

Placental outcomes

what type of placental remodeling?



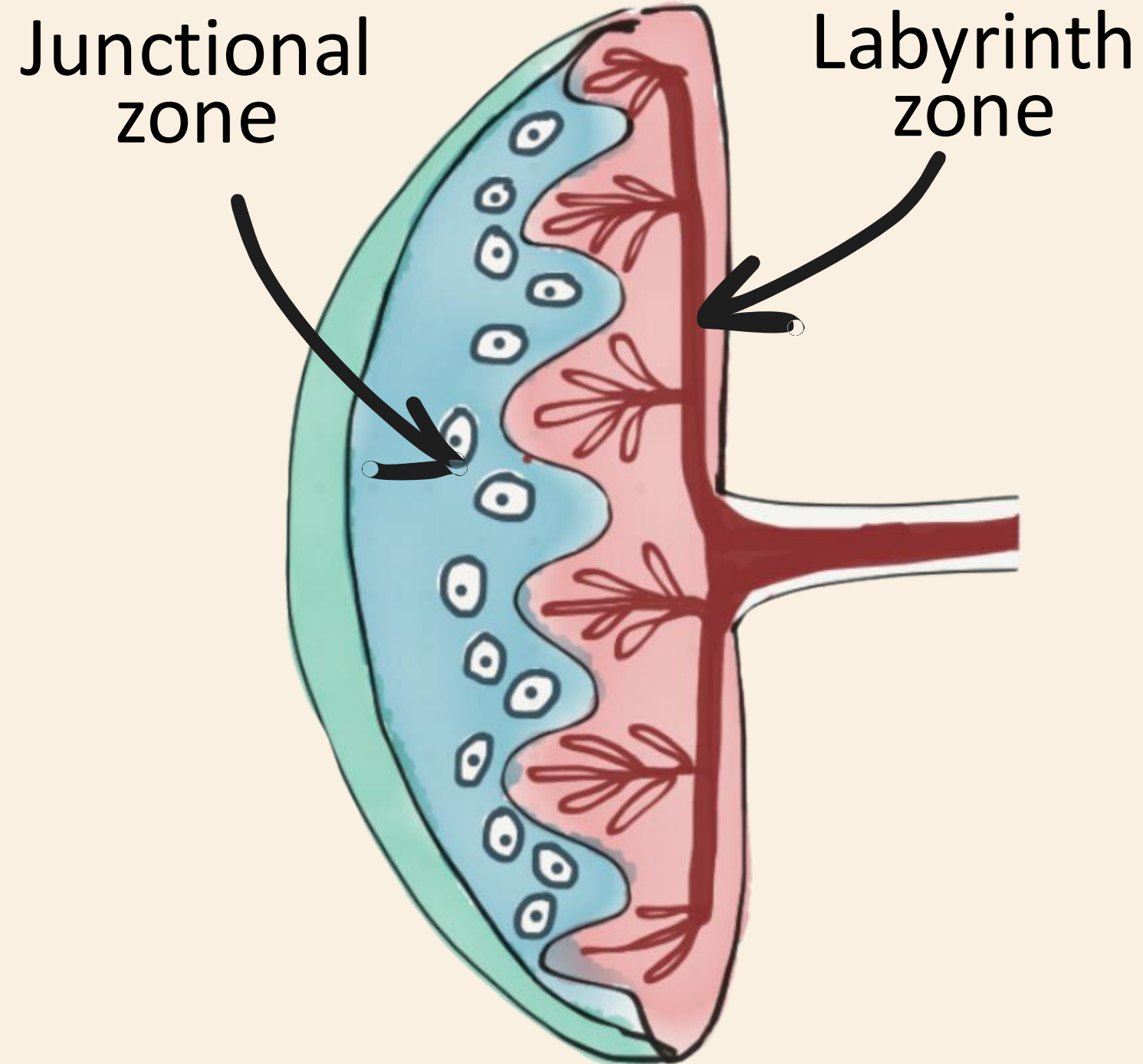
Maternal vascular space



11 Conclusion

Placental outcomes

Control placenta



Hyperglycaemic placenta

