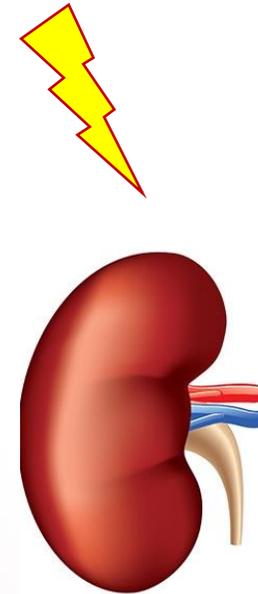


De la diminution des capacités rénales aux grossesses compliquées

Pr Vincent Dupont
Néphrologie CHU Reims



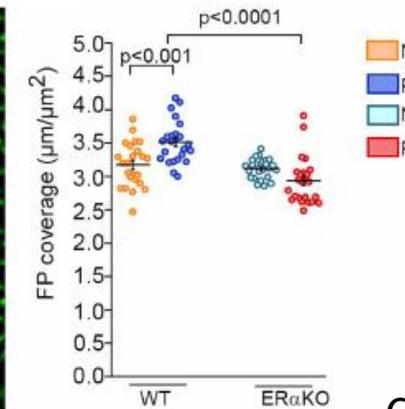
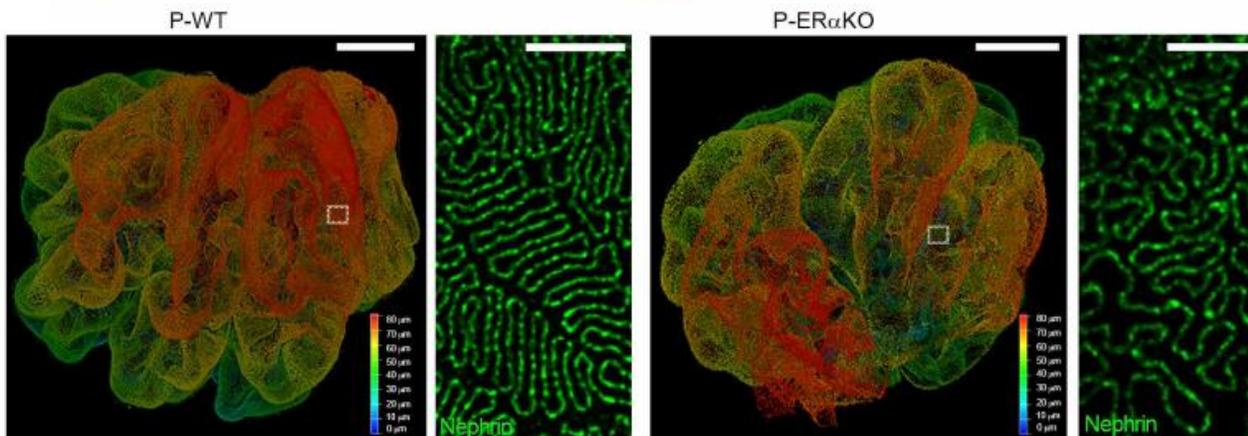
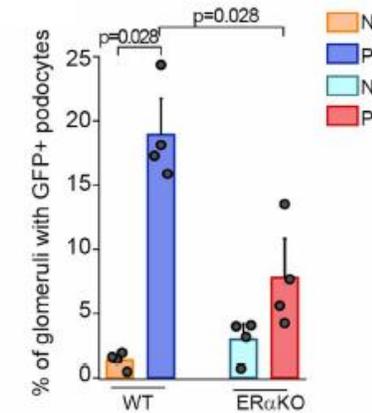
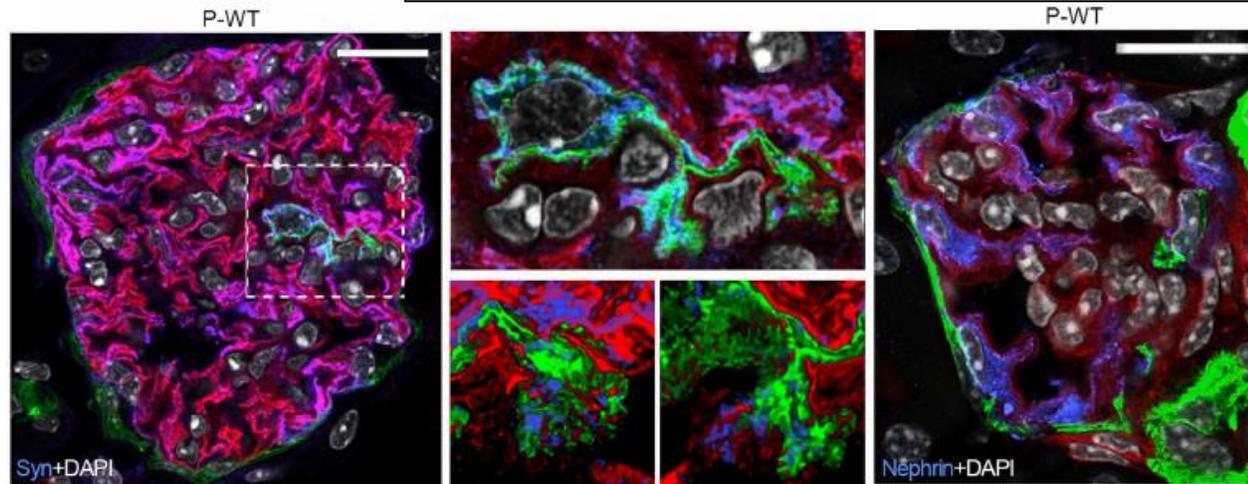
La grossesse = une épreuve d'effort rénale



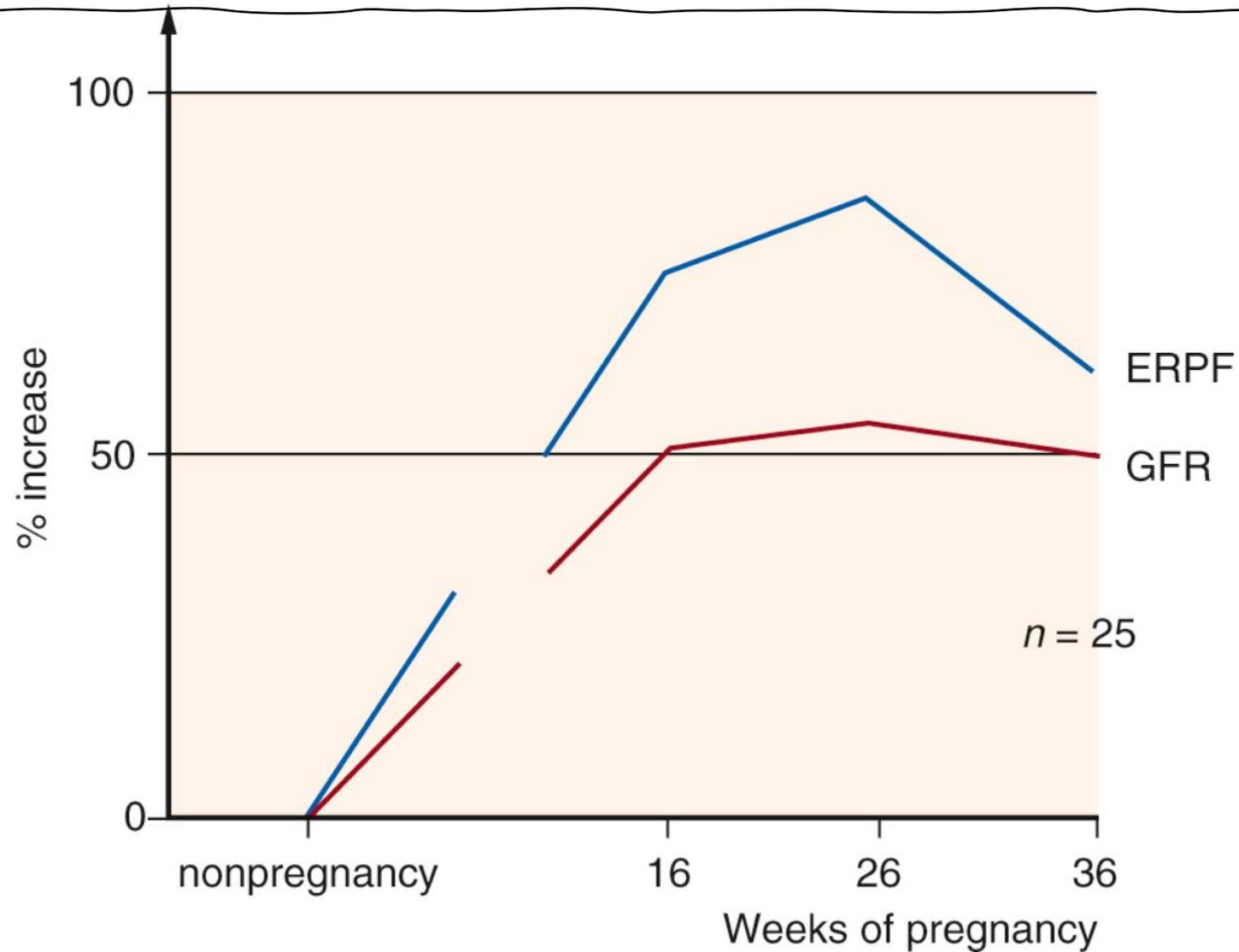


« Être prête » en physiologie

↑ Podocytes ER α dépendante



« Être prête » en physiologie



IRC & grossesse

- Systematic Review and Meta-Analysis
 - 23 studies – 506 340 pregnancies
- **Preeclampsia OR 10.36 (95%CI 6.27-17.09)**
- Preterm Delivery OR 5.72 (95CI 3.26-10.03)
- SGA OR 4.85 (95%CI 3.03-7.76)
- C section OR 2.67 (95CI 2.01-3.54)

Transplantation rénale & grossesse

- Systematic Review and Meta-Analysis
 - 87 studies – 6712 pregnancies

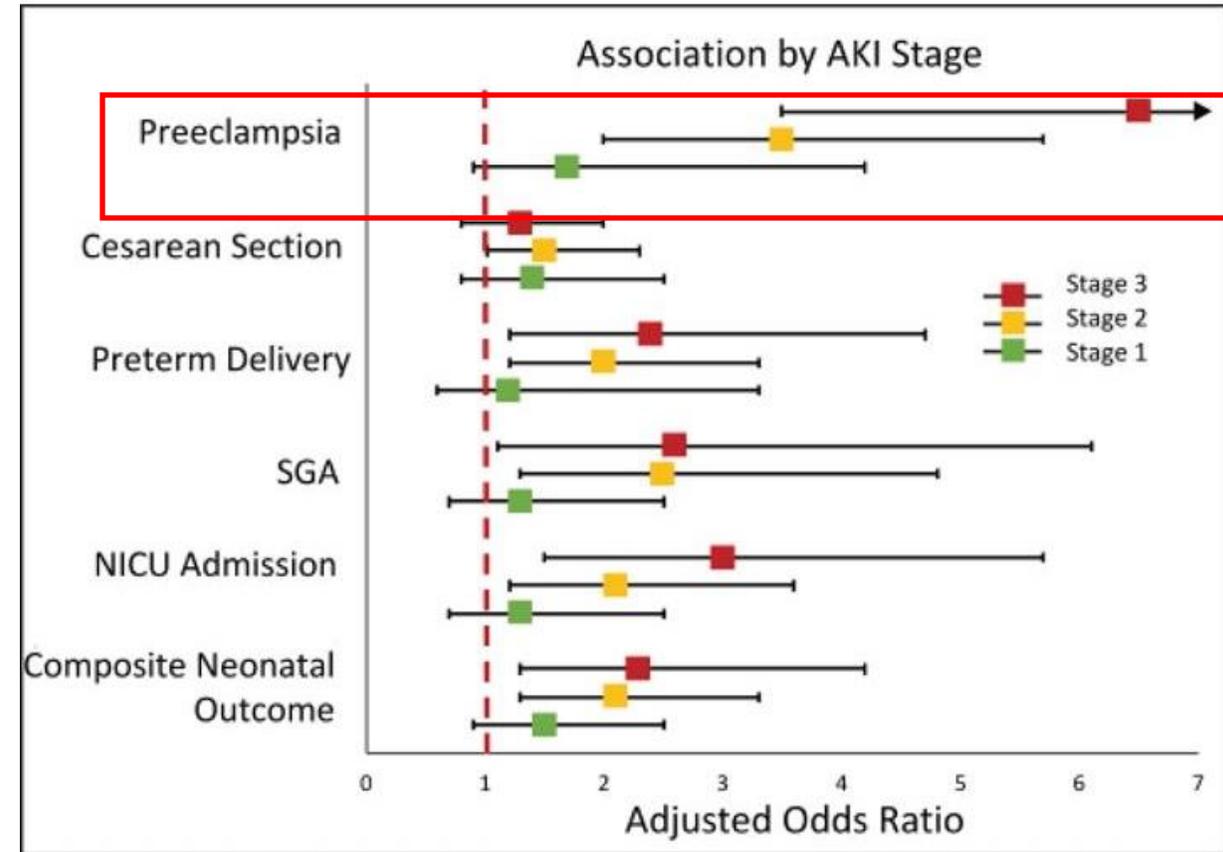
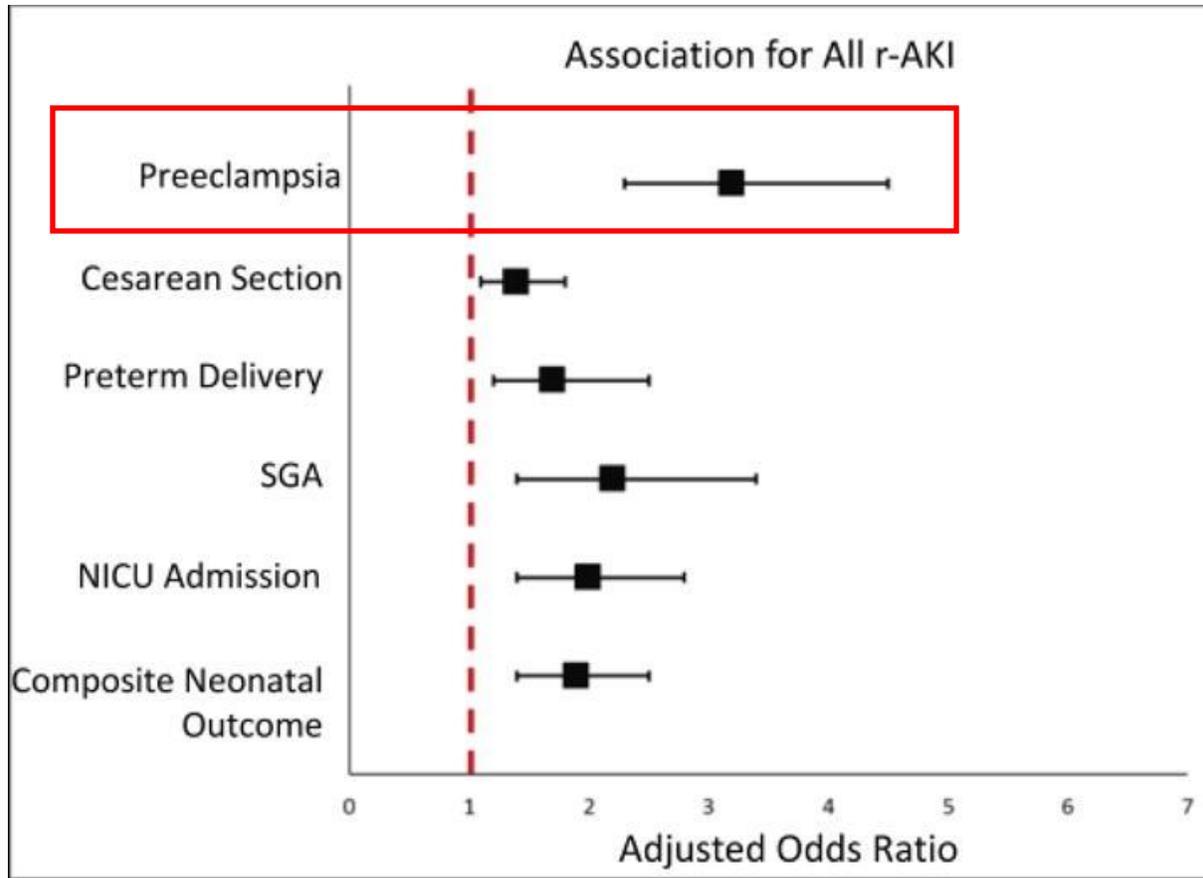
- **Preeclampsia 21.5%; 95%CI 18.5-24.9**

- Preterm Delivery 43.1%; 95%CI 38.7-47.6)

- Mean birth weight 2470g

- C section 62.6; 05%CI 57.6-67.3)

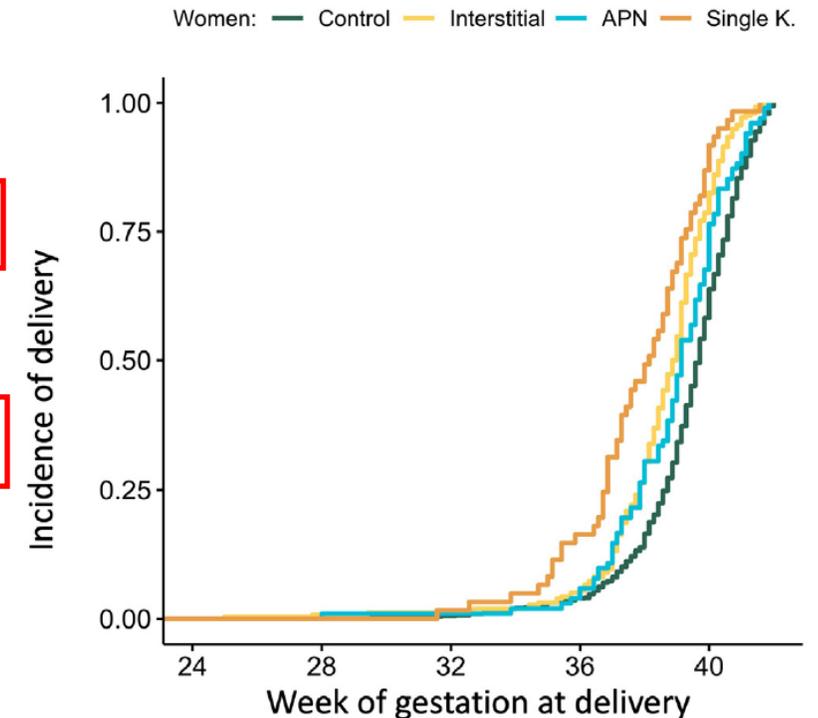
IRA & grossesse



N'importe quelle atteinte rénale !

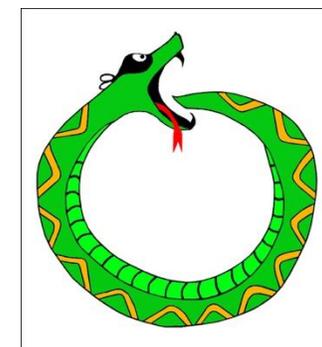
Main outcomes in patients with singleton live-born deliveries in CKD stage 1, proteinuria <0.5 g/d, no hypertension, and interstitial diseases versus controls

Overall data	Matched controls (n = 842)	Nephropathies (all interstitial disease included) (n = 421)	P value all cases vs. matched controls
Delivery data			
Cesarean section, n (%)	231 (24.8)	125 (29.7)	0.401
Term, wk, median [Q1–Q3]	39.0 [38.0–40.0]	38.0 [37.0–39.0]	<0.001
Term <37 gw, n (%)	62 (7.4)	55 (13.1)	<0.001
Term <34 gw, n (%)	16 (1.9)	10 (2.4)	0.575
Term <32 gw, n (%)	5 (0.6)	5 (1.2)	0.262
Term <28 gw, n (%)	0 (0.0)	2 (0.5)	–
Offspring data			
Weight at delivery, median [Q1–Q3]	3260 [2980–3530]	3080 [2800–3400]	<0.001
Weight <2500 g, n (%)	47 (5.6)	50 (11.9)	<0.001
Weight <1500 g, n (%)	8 (1.0)	7 (1.7)	0.270
Centile, median [Q1–Q3]	48.6 [25.8–73.3]	48.4 [23.6–70.7]	0.390
Centile <10, n (%)	78 (9.3)	40 (9.5)	0.891
Centile <5, n (%)	41 (4.9)	29 (6.9)	0.139
Hospitalization in NICU, n (%)	29 (3.7)	18 (6.1)	0.084
Other pregnancy-related outcome			
Preeclampsia, n (%)	14 (1.7)	15 (3.6)	0.034



Pourquoi s'intéresser à la prééclampsie ?

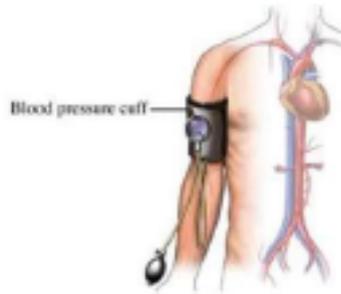
- 3-5% de toutes les grossesses (**10 millions /an**)
- **80 000 morts maternelles / an**
- Pour les survivantes :
 - ↑ risque HTA, cardiopathie ischémique, AVC, mortalité cardio-vasculaire, IRC
- **500 000 morts fœtales / an**
- Pour les nouveaux nés survivants :
 - ↑ risque HTA, maladie cardiovasculaire, trouble développement cognitif, **IRC**
- **Pas de traitement à l'heure actuelle**



La prééclampsie, c'est quoi ?

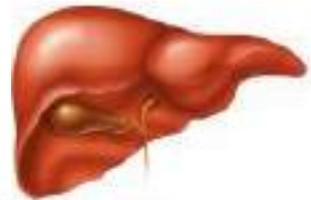
- Au delà de la 20^{ème} semaine d'aménorrhée

- Hypertension artérielle

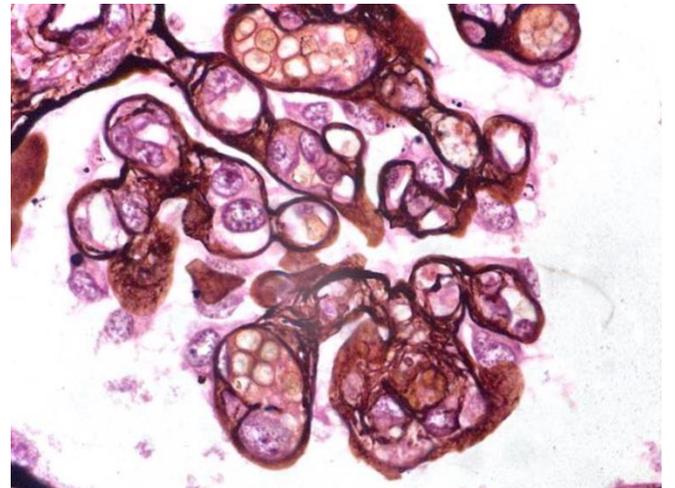
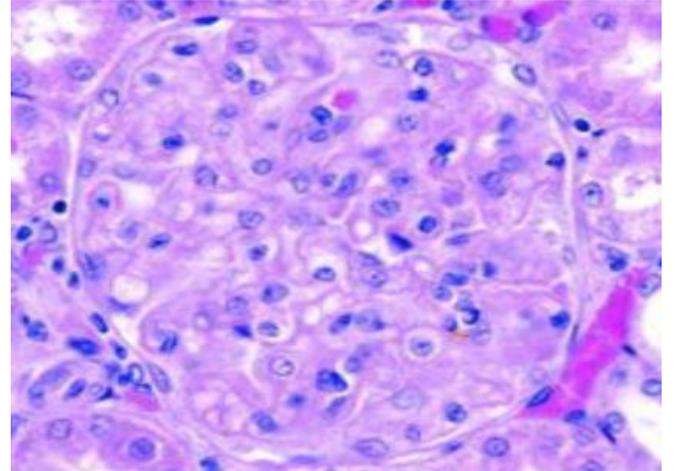


- Protéinurie

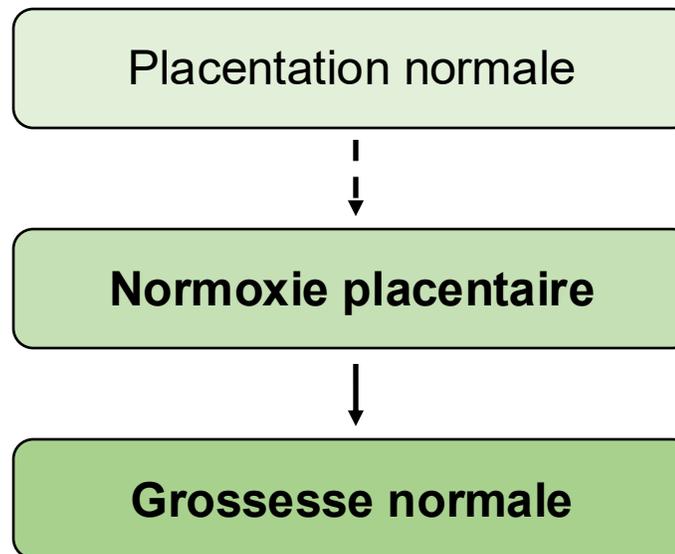
- HELLP syndrome



- Eclampsie

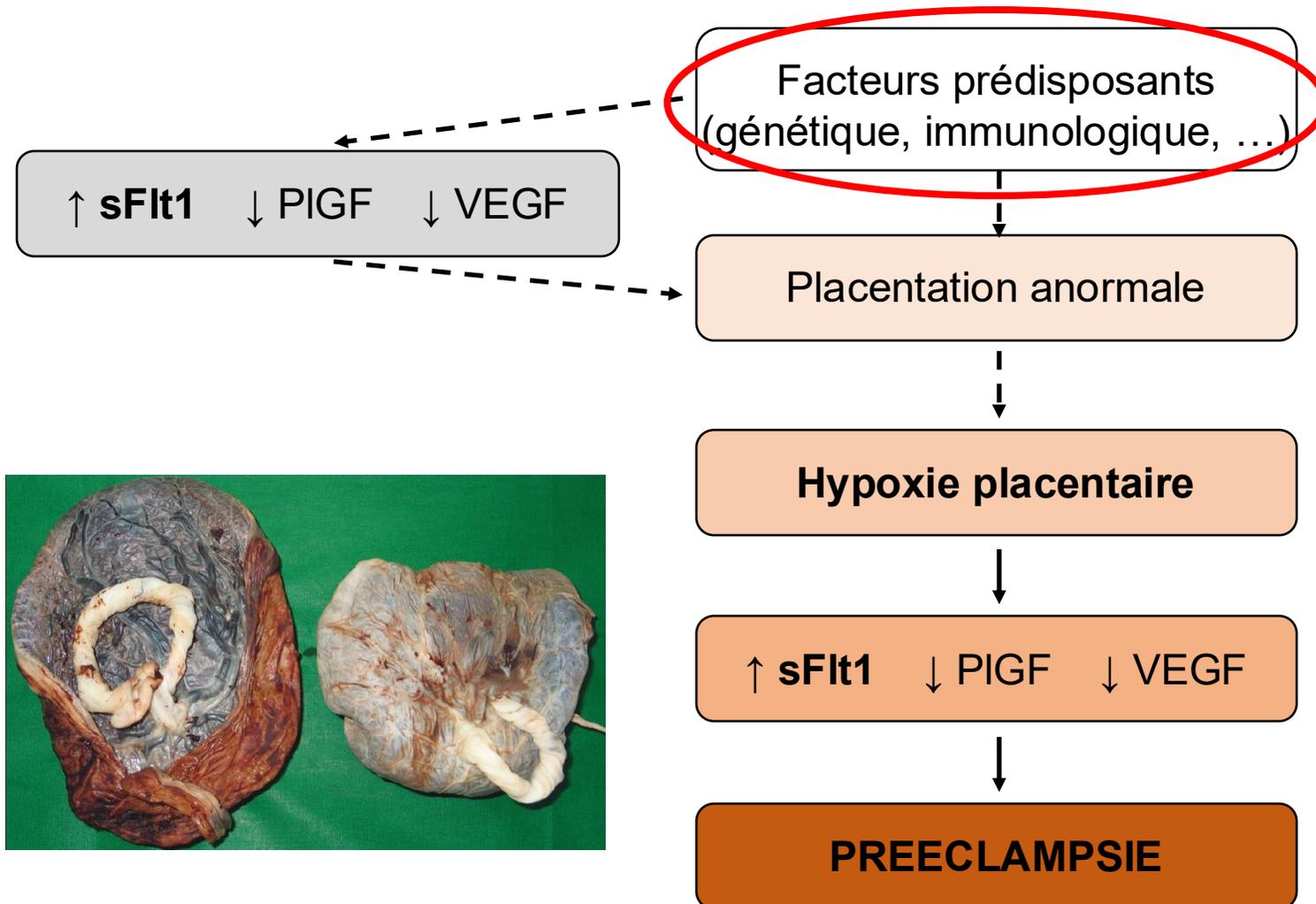


La prééclampsie, c'est quoi ?



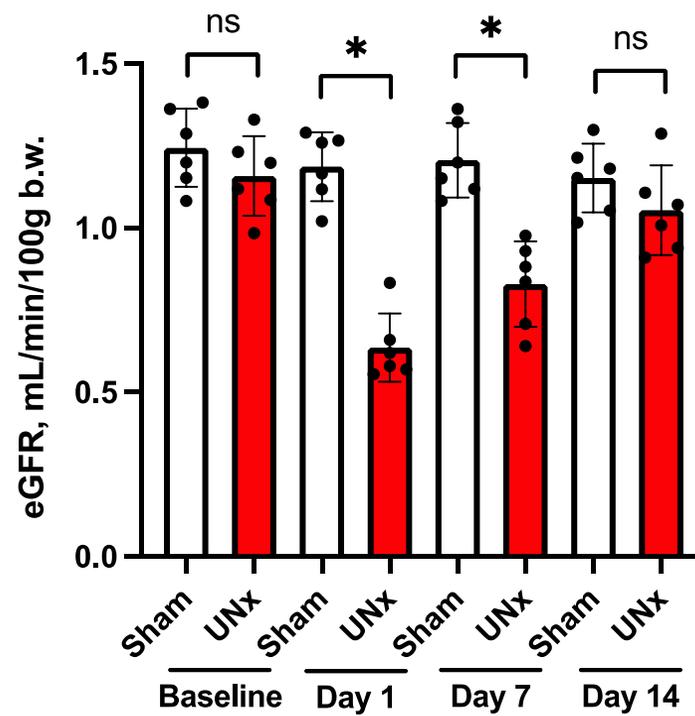
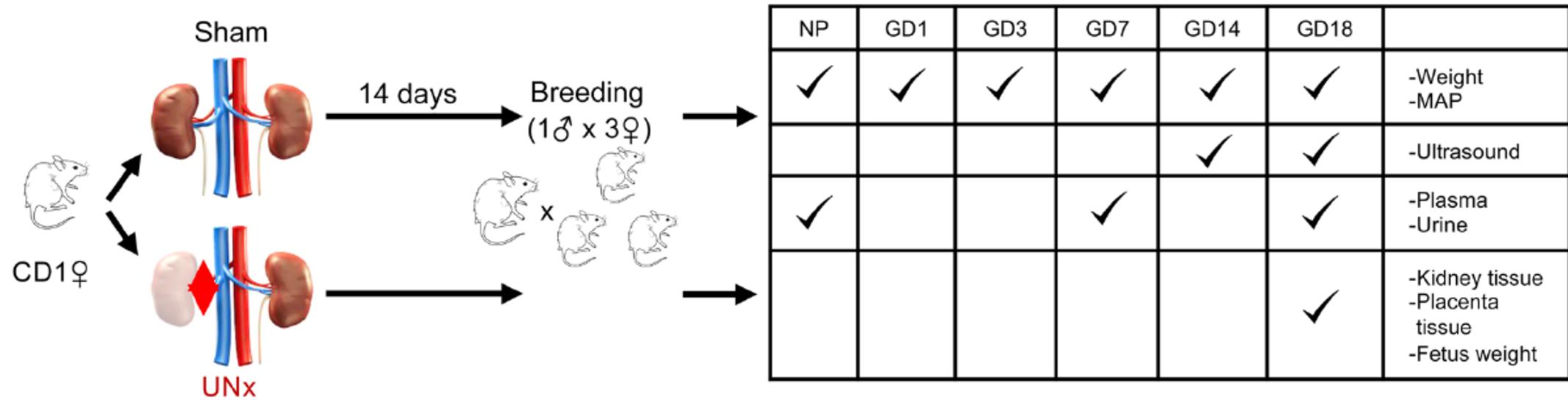
- Invasion cytotrophoblastique
- Remodelage des artères spiralées
- Augmentation Q_{sanguin} utérin x10

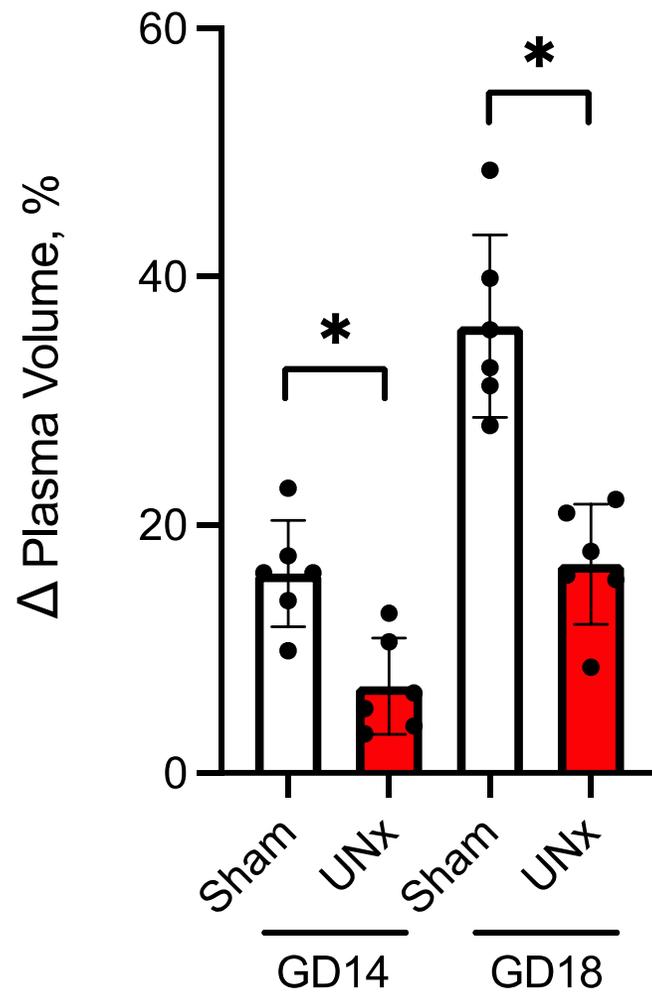
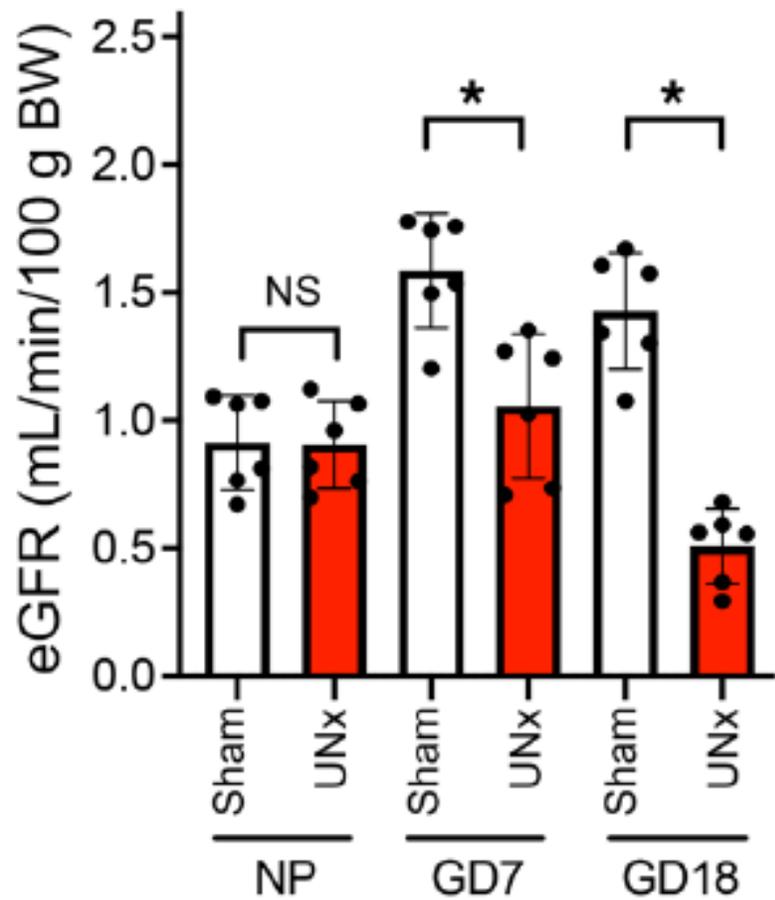
La prééclampsie, c'est quoi ?

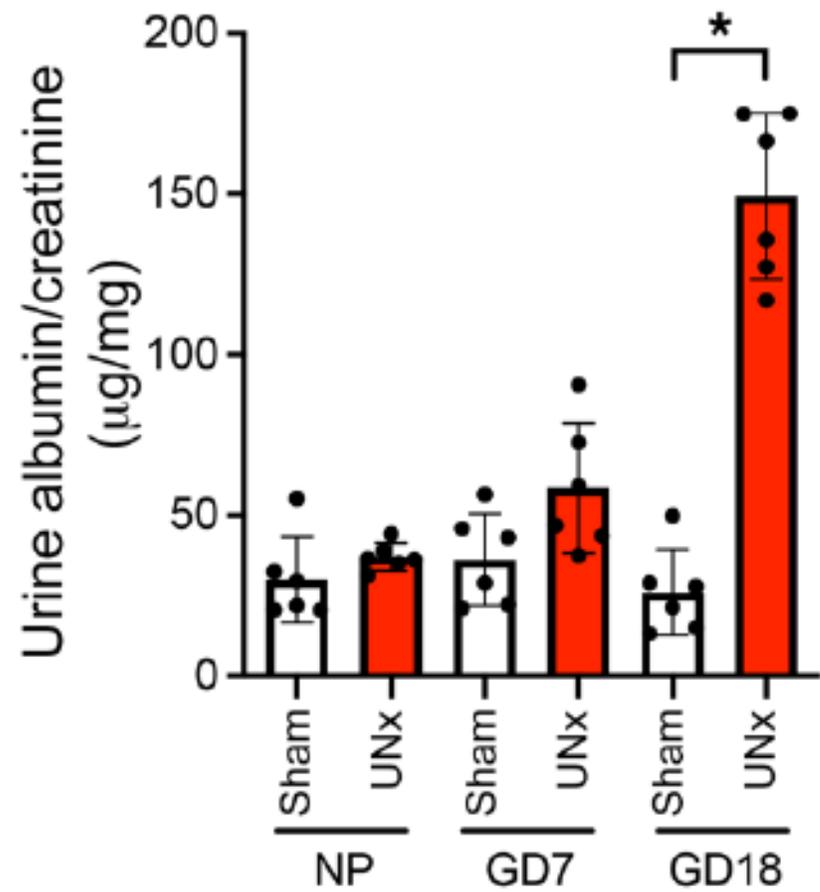
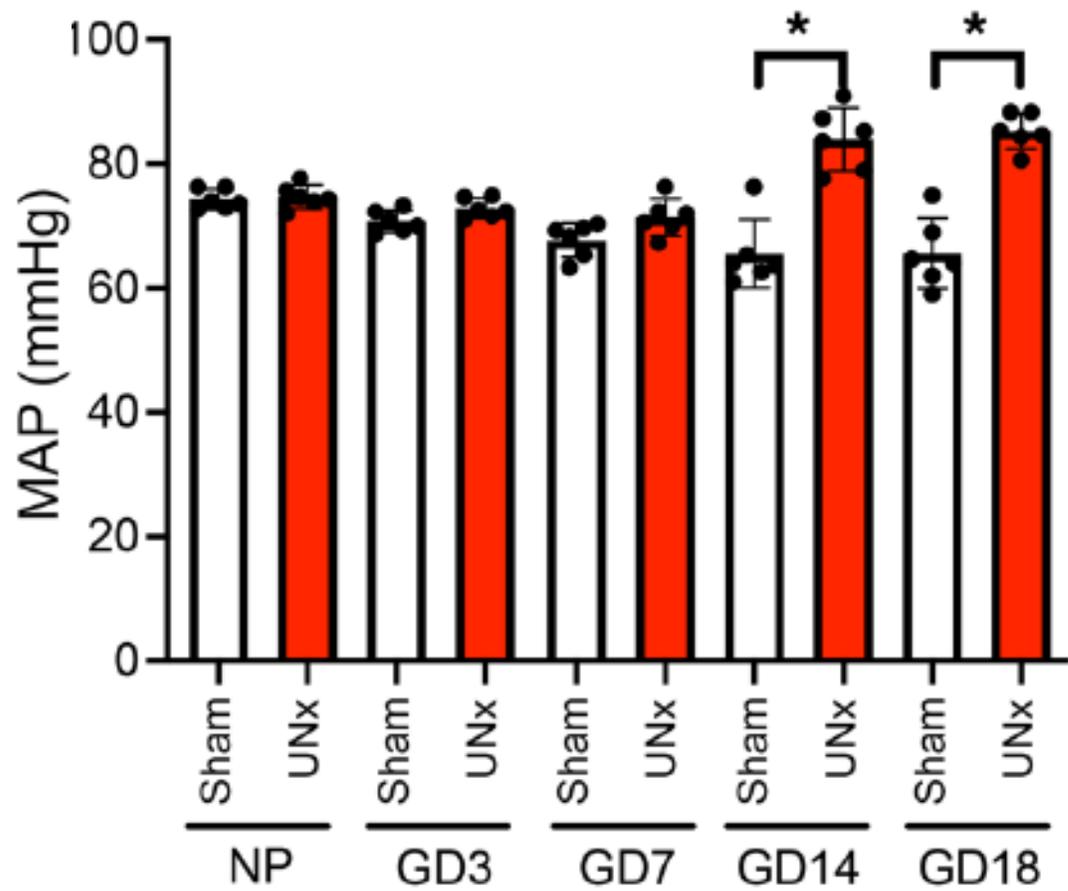


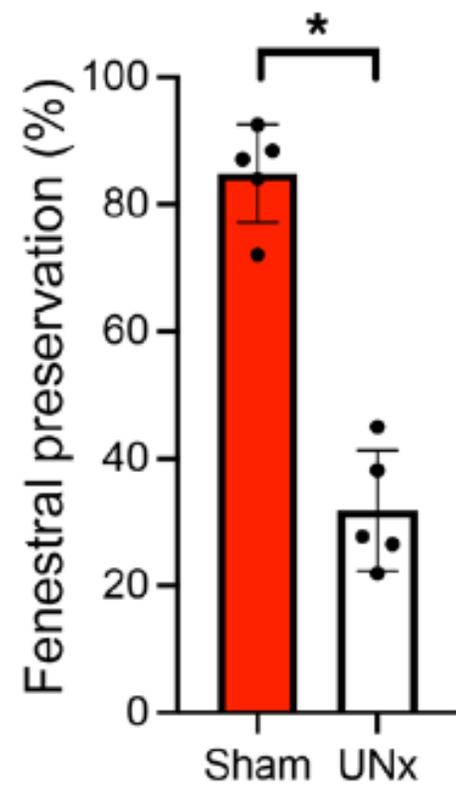
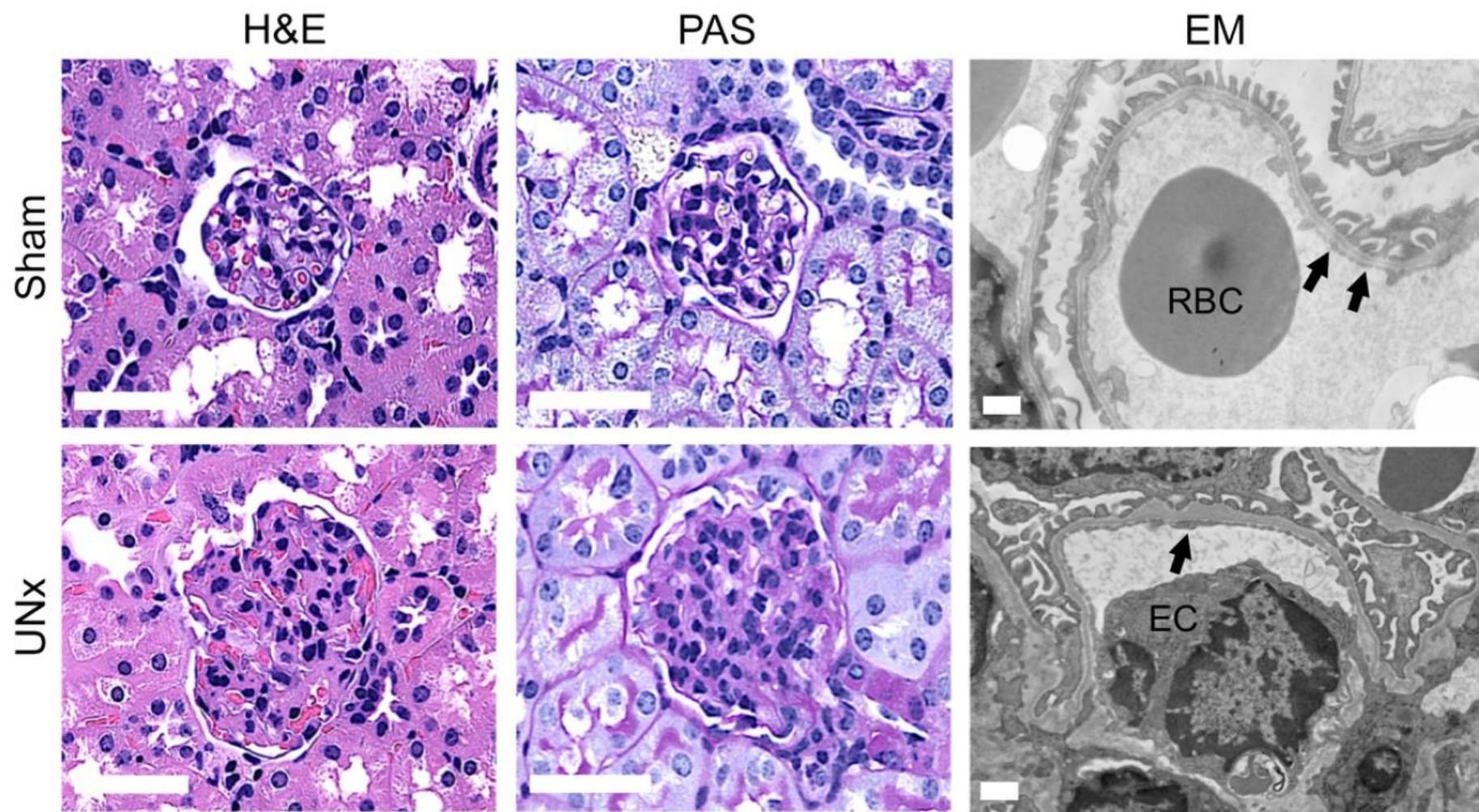
Facteurs de risque de prééclampsie

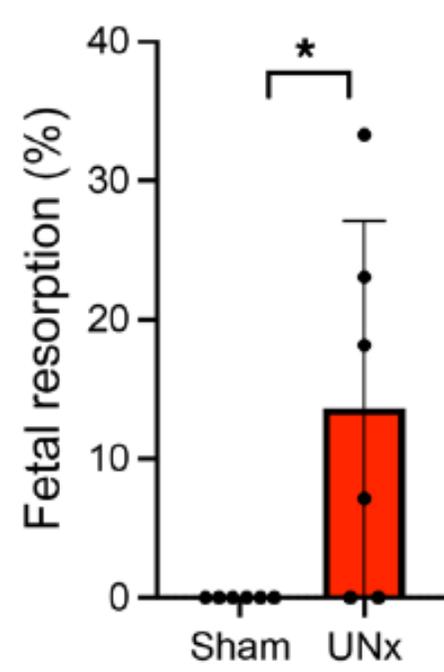
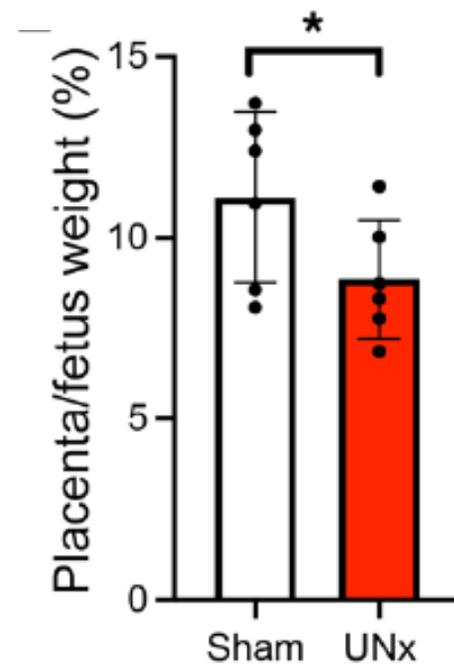
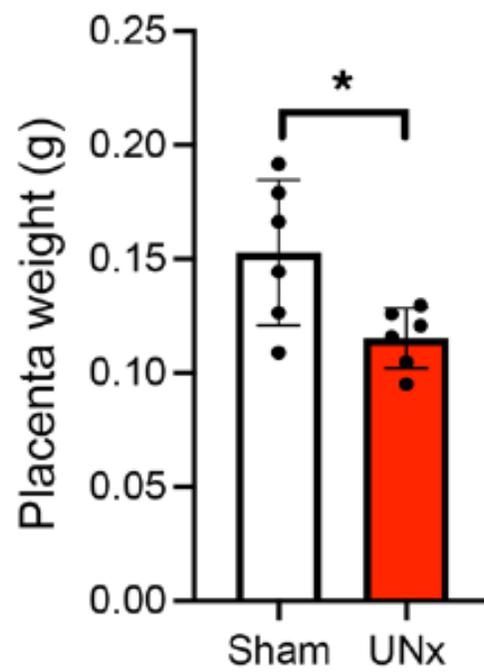
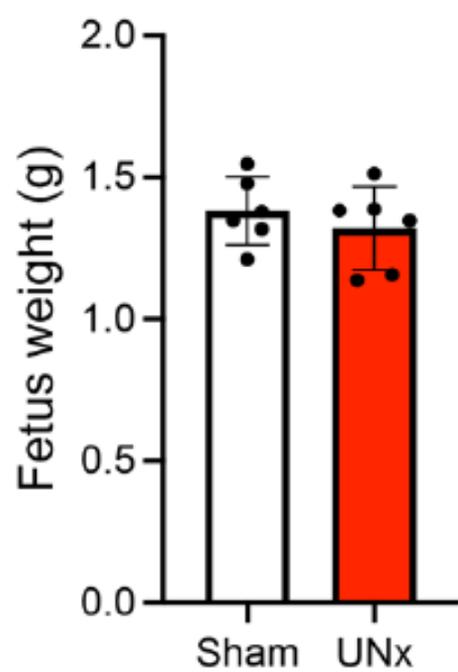
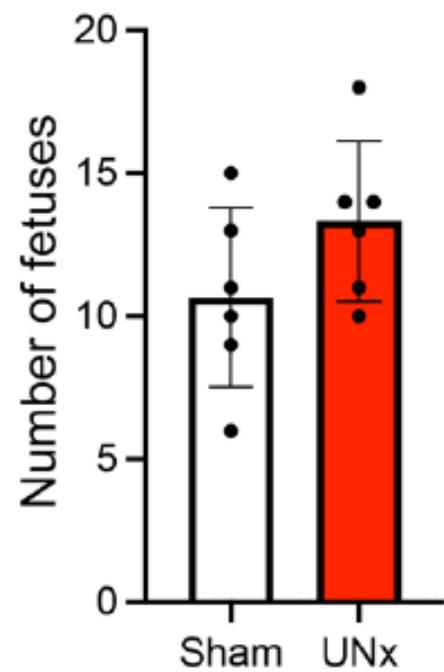
Risk factor	OR or RR (95% CI)
Antiphospholipid antibody syndrome	9.7 (4.3–21.7)
Renal disease	7.8 (2.2–28.2)
Prior preeclampsia	7.2 (5.8–8.8)
Systemic lupus erythmatosis	5.7 (2.0–16.2)
Nulliparity	5.4 (2.8–10.3)
HIV+ HAART treatment	5.6 (1.7–18.1)
HIV positive (untreated)	4.9 (2.4–10.1)
Chronic hypertension	3.8 (3.4–4.3)
Diabetes Mellitus	3.6 (2.5–5.0)
Multiple Gestation	3.5 (3.0–4.2)
Strong family history of cardiovascular disease (heart disease or stroke in ≥ 2 first degree relatives)	3.2 (1.4–7.7)
Obesity	2.5 (1.7–3.7)
Family history of preeclampsia in first degree relative	2.3–2.6 (1.8–3.6)
Advanced maternal age (>40) for multips	1.96 (1.34–2.87)
Advanced maternal age (>40) for nulliparas	1.68 (1.23–2.29)

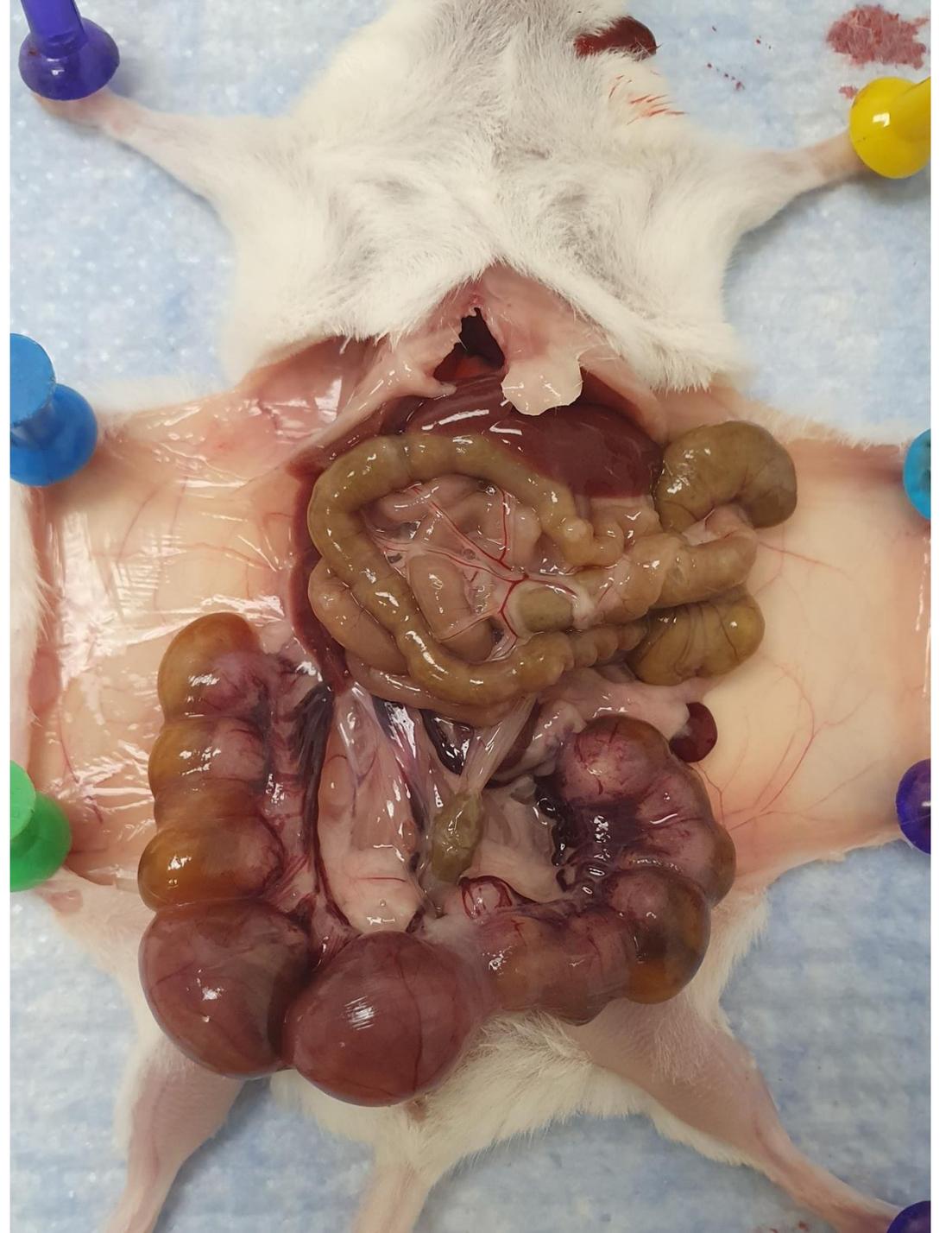




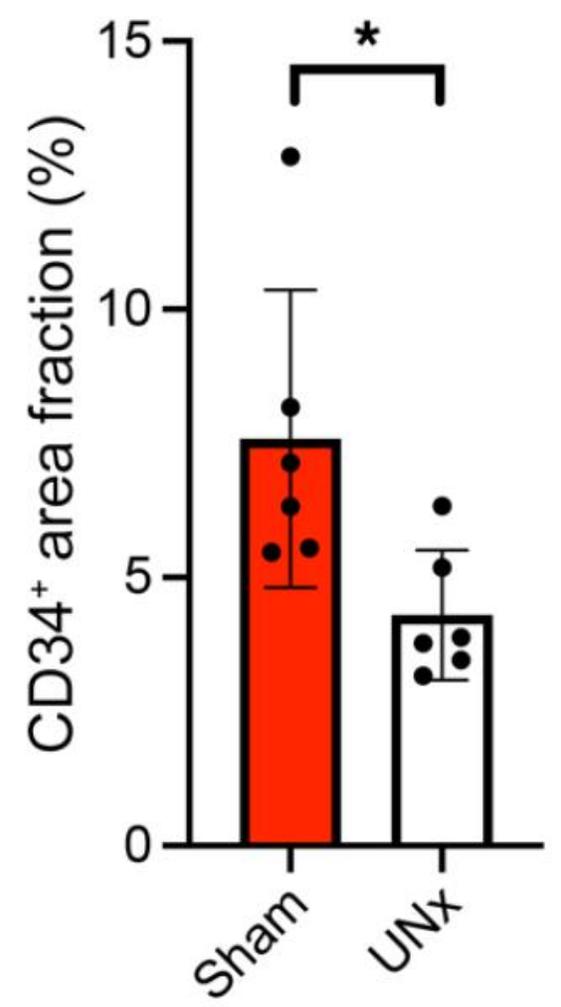
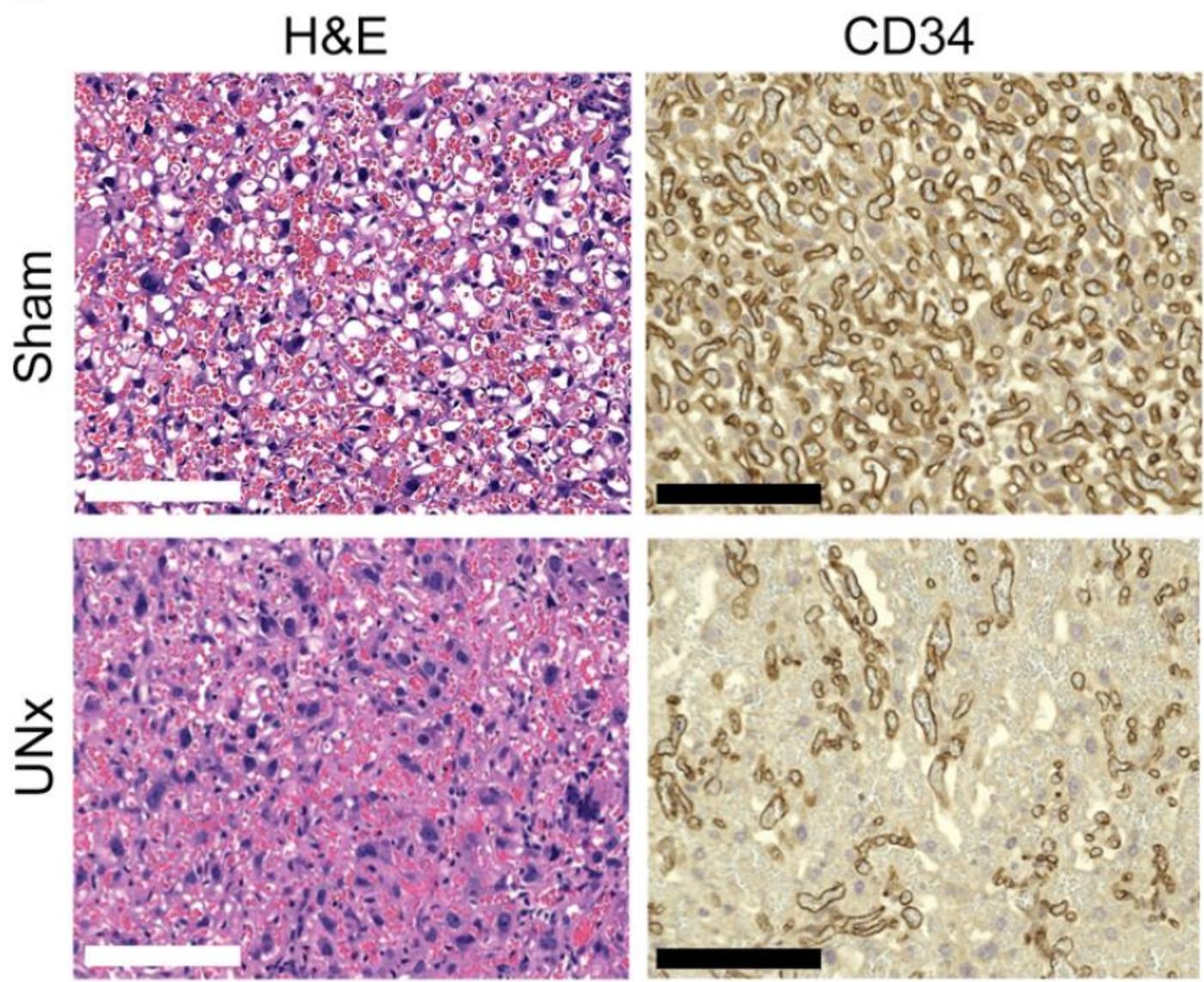




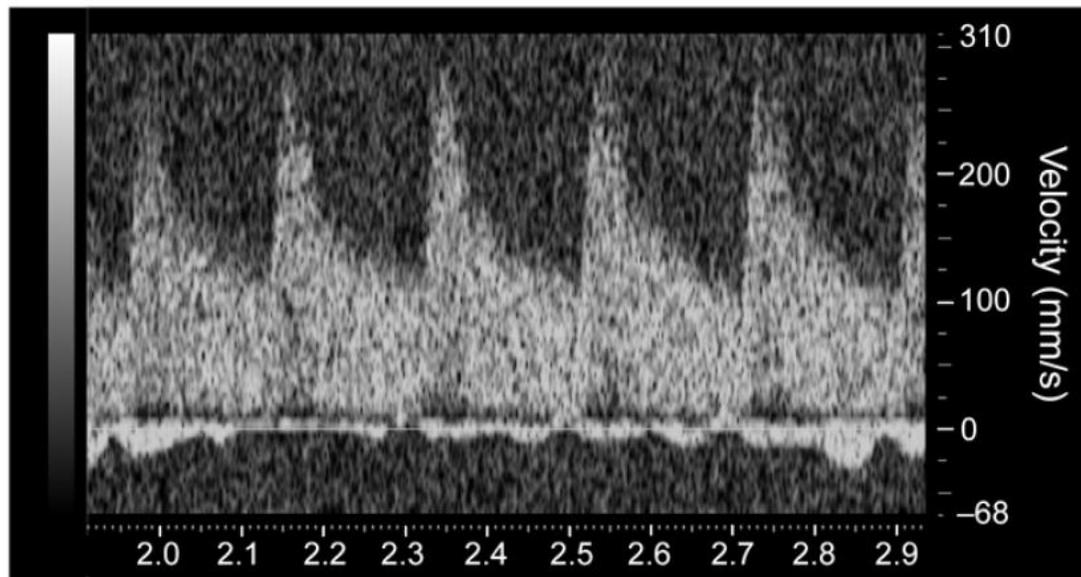




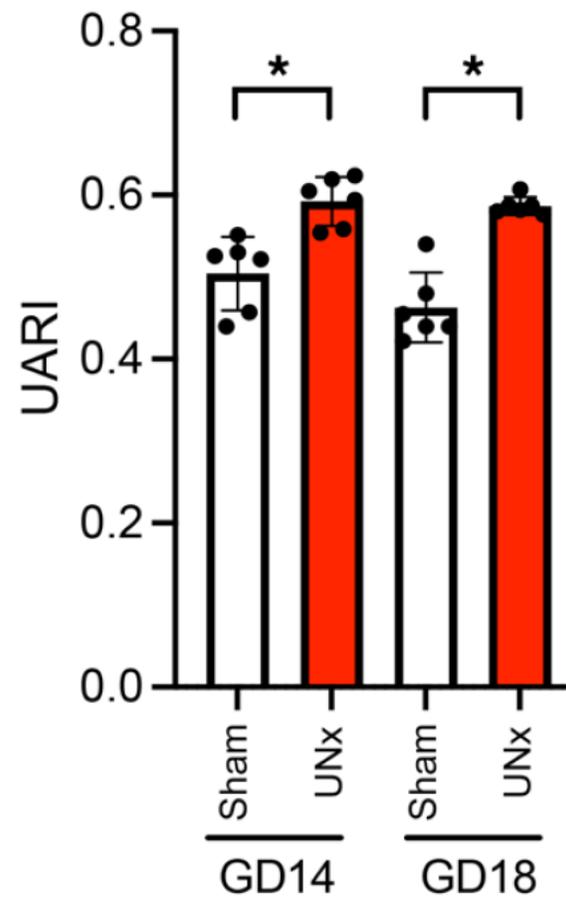
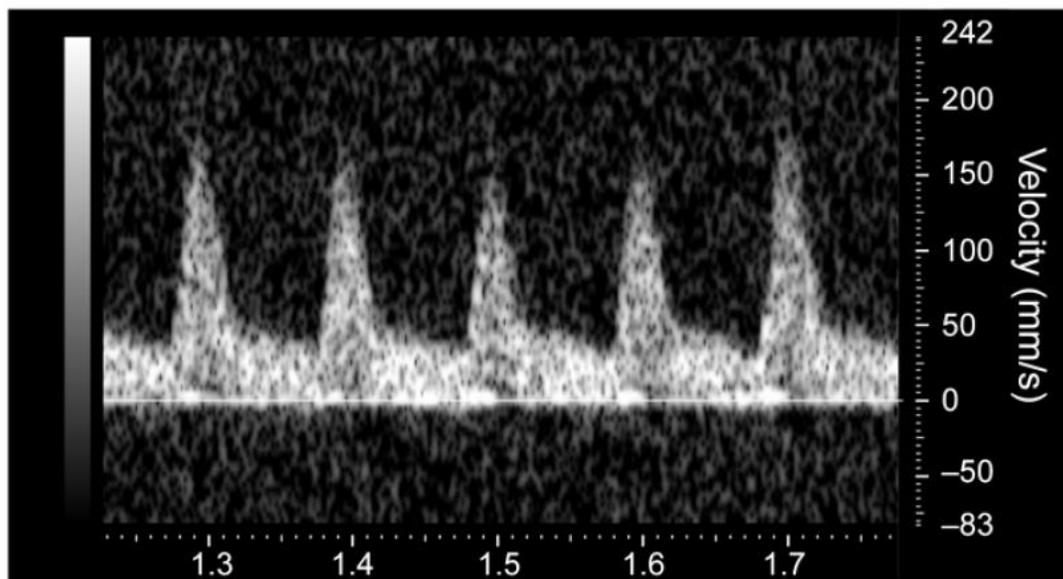


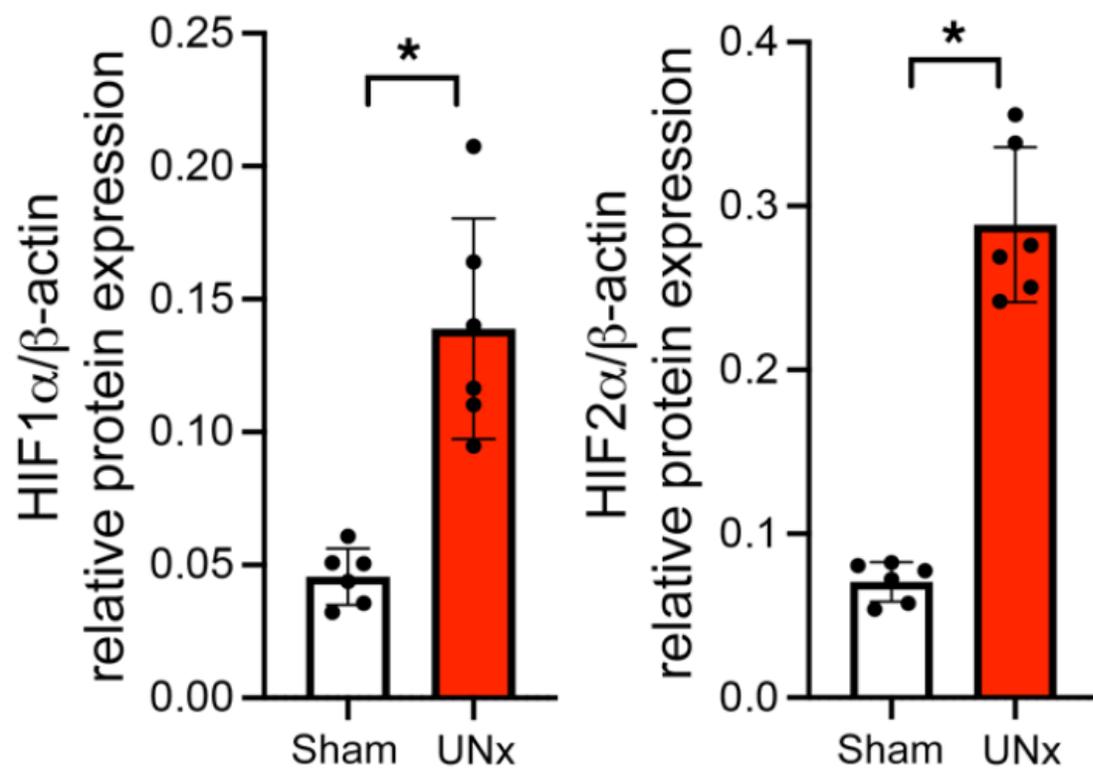
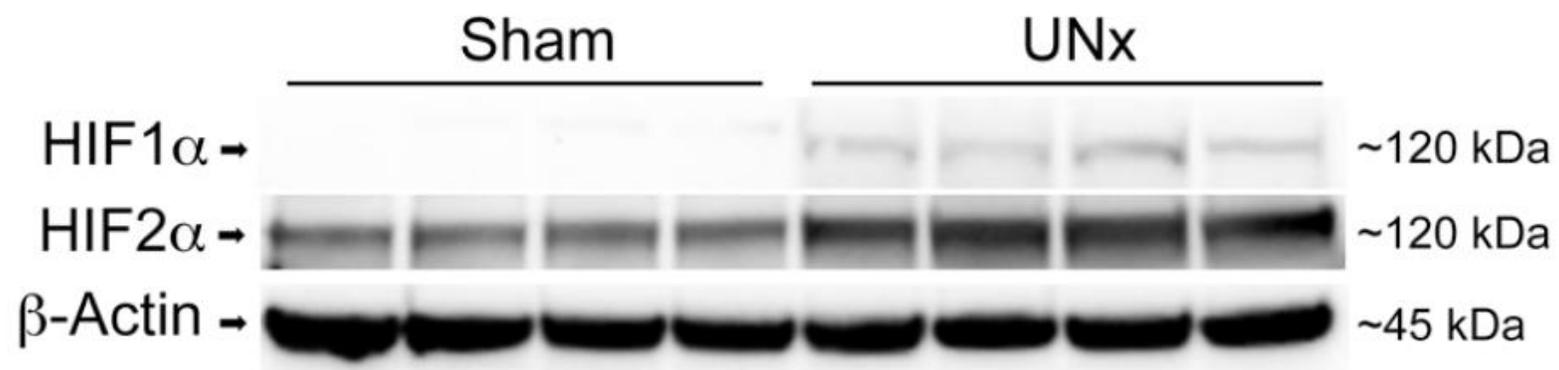


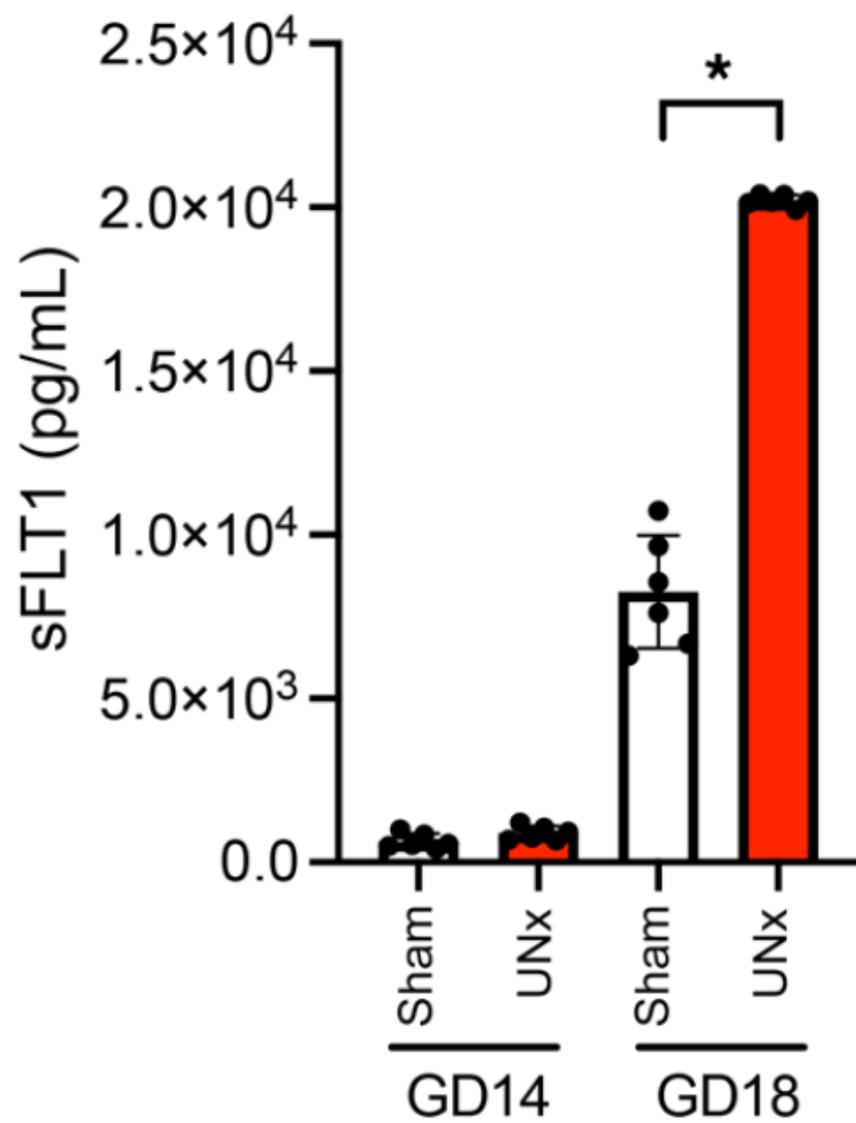
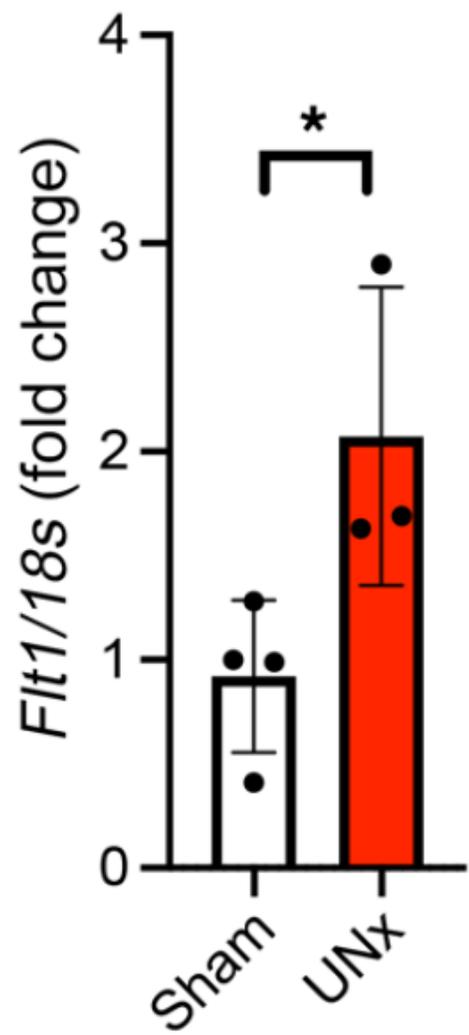
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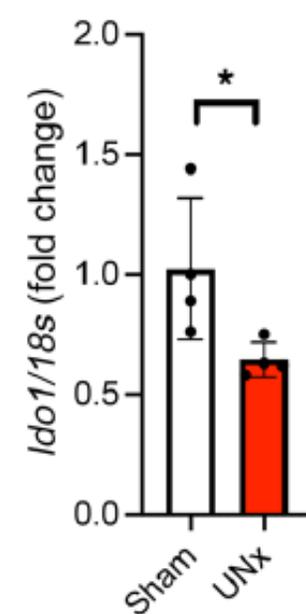
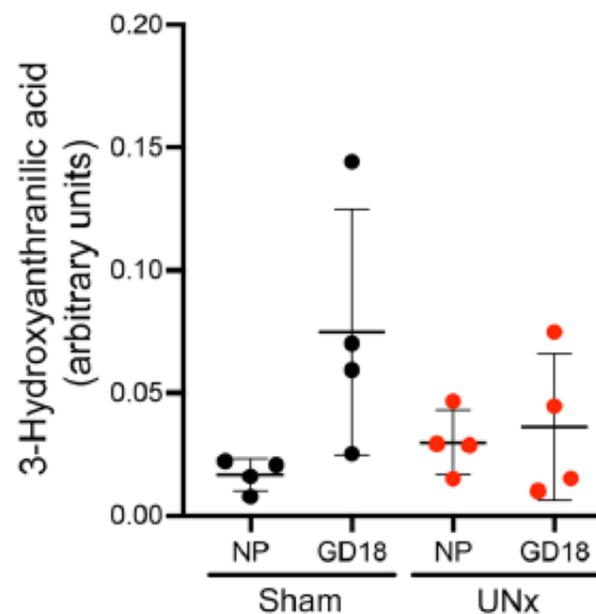
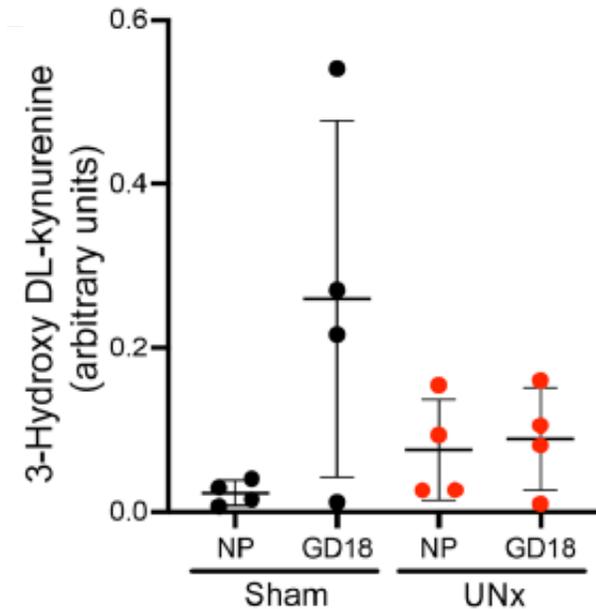
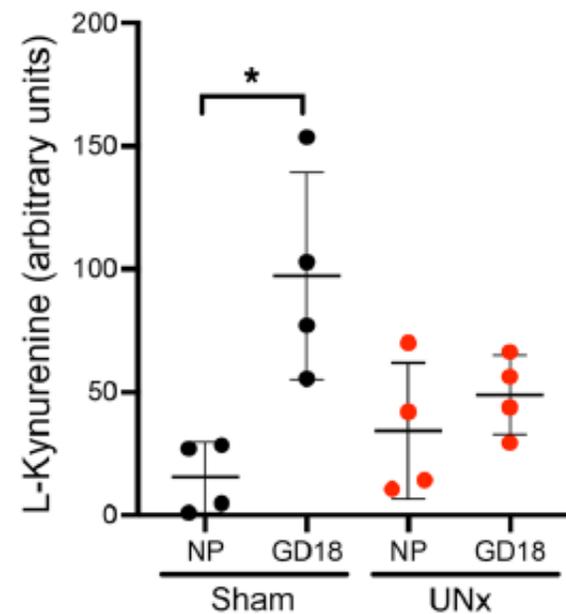
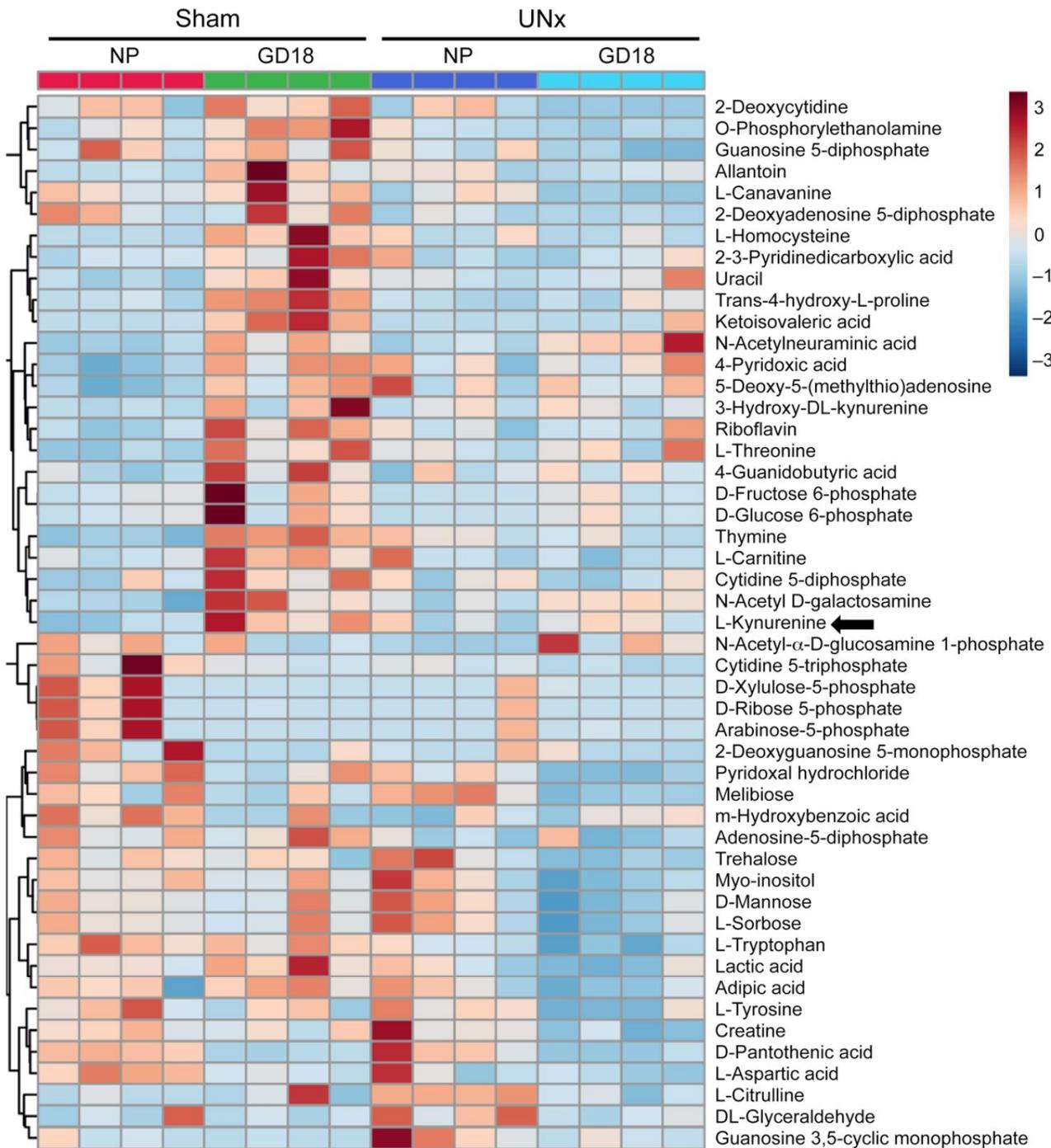


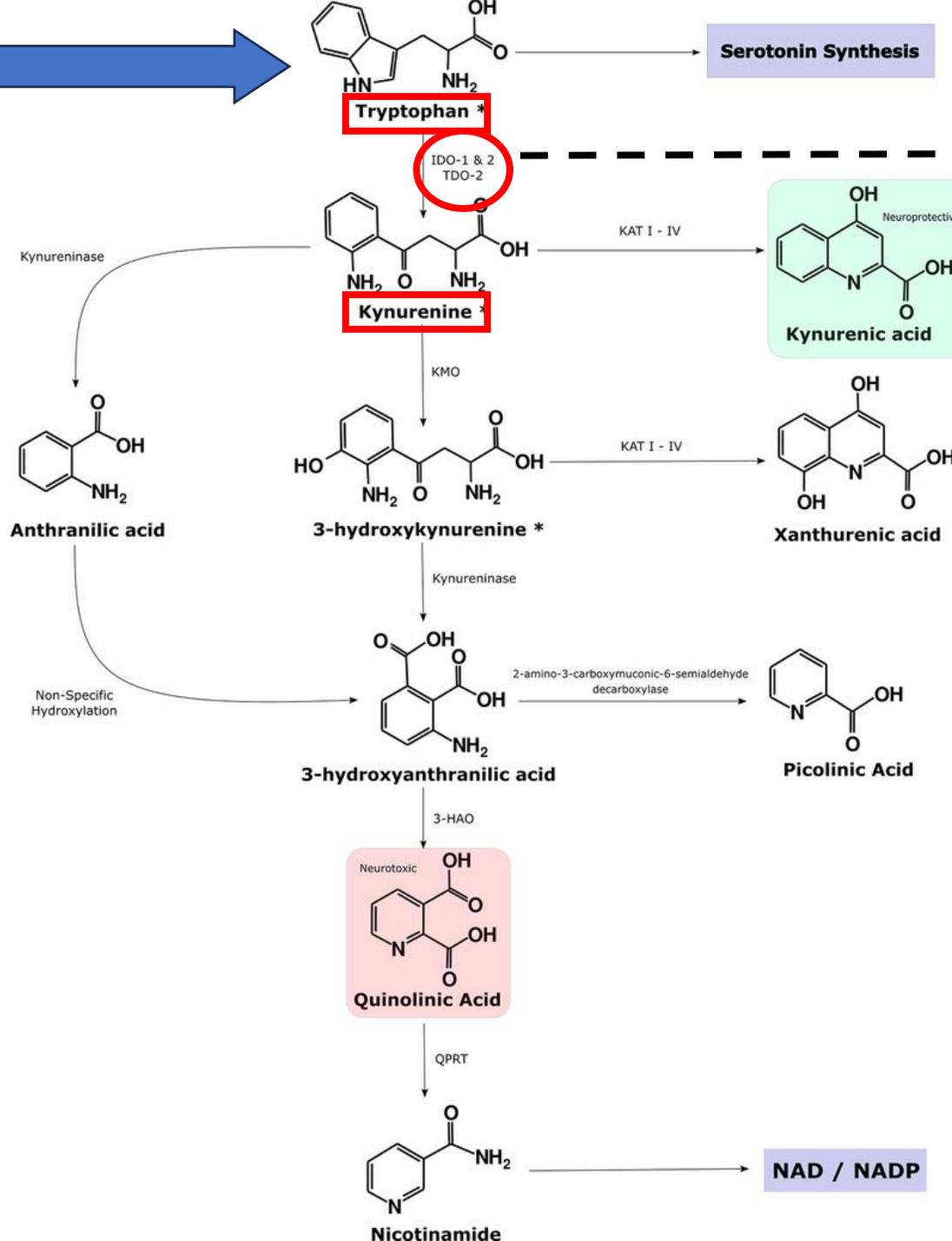
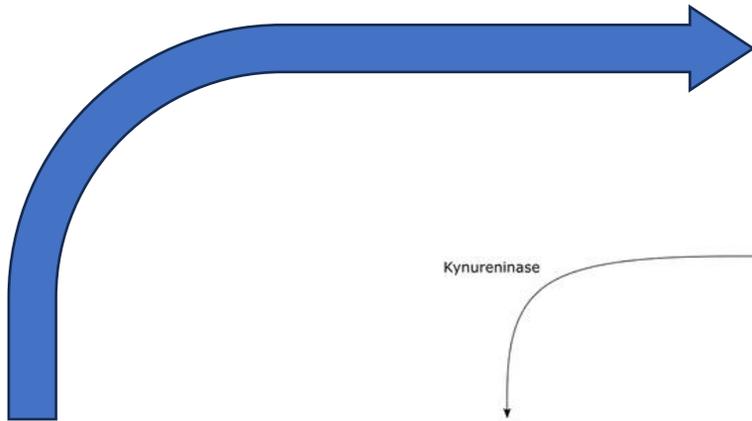
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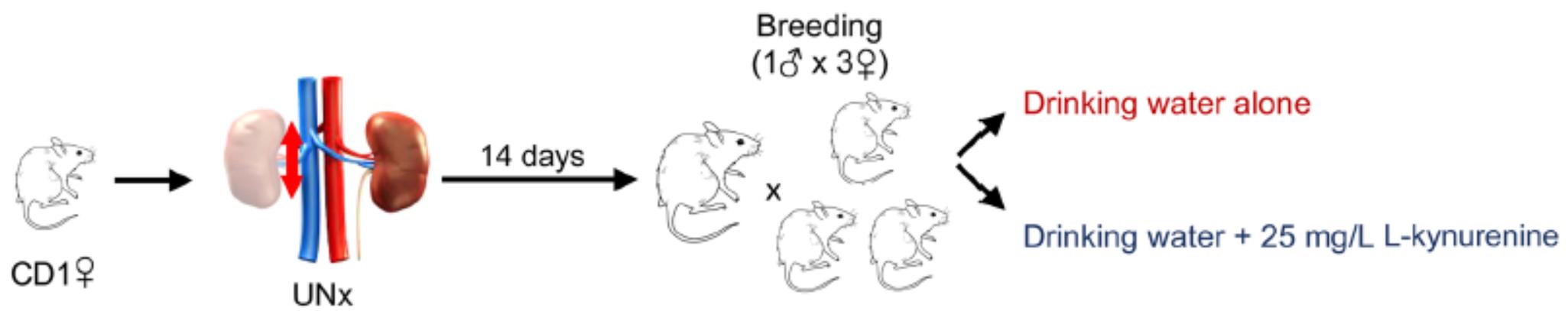


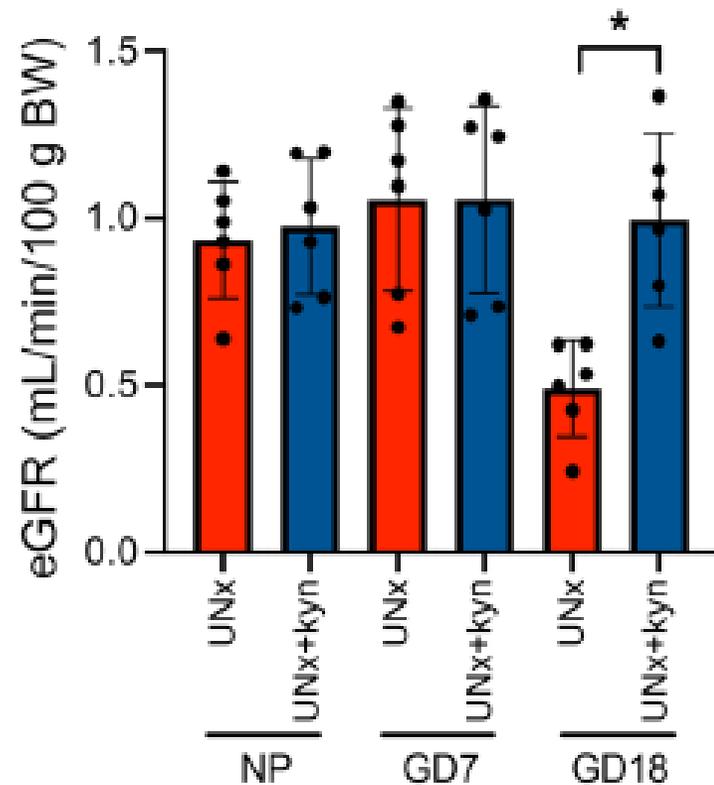
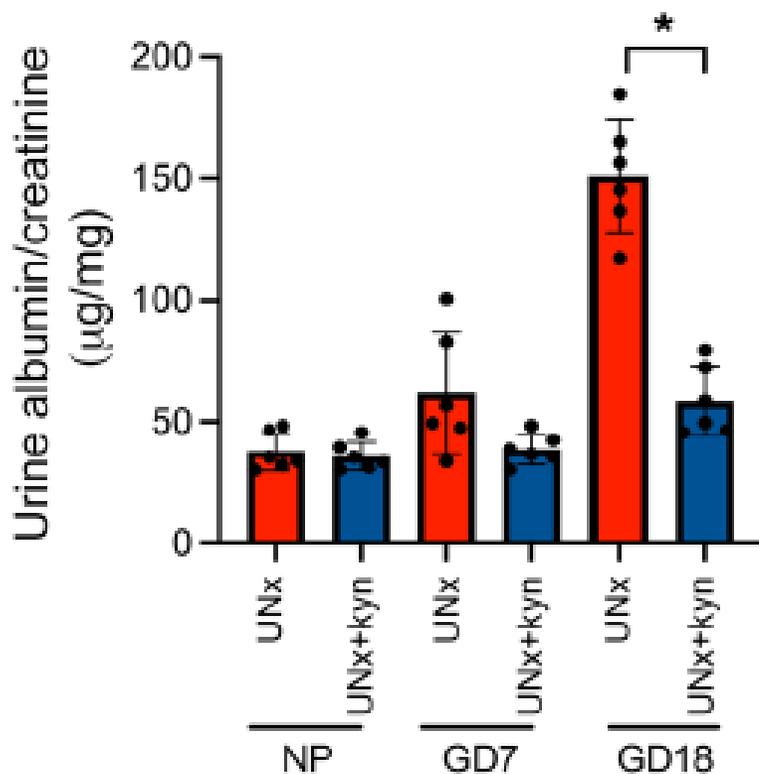
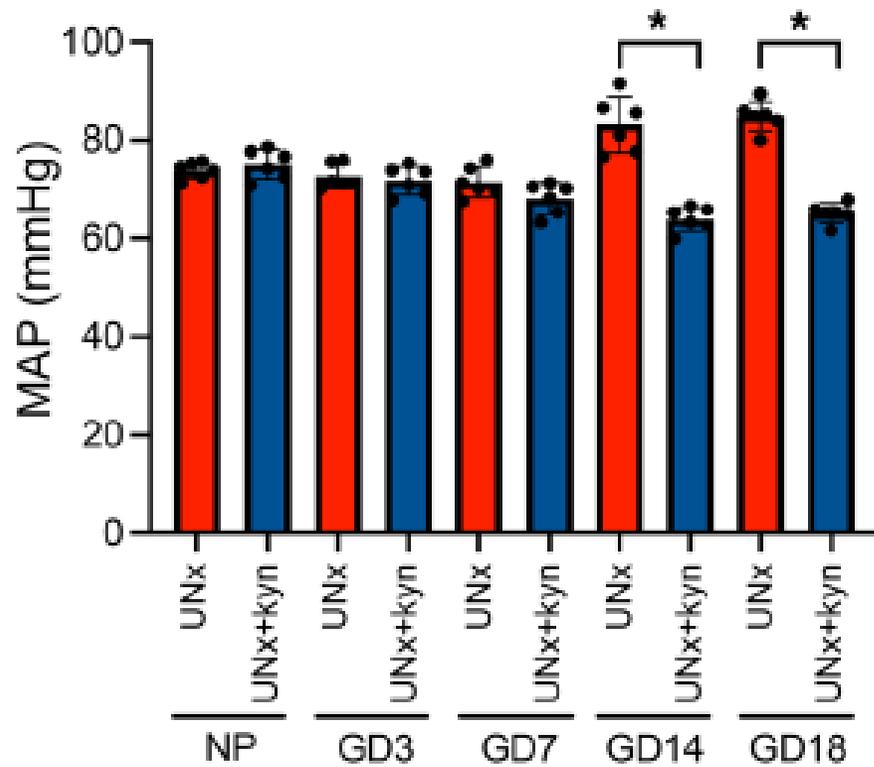






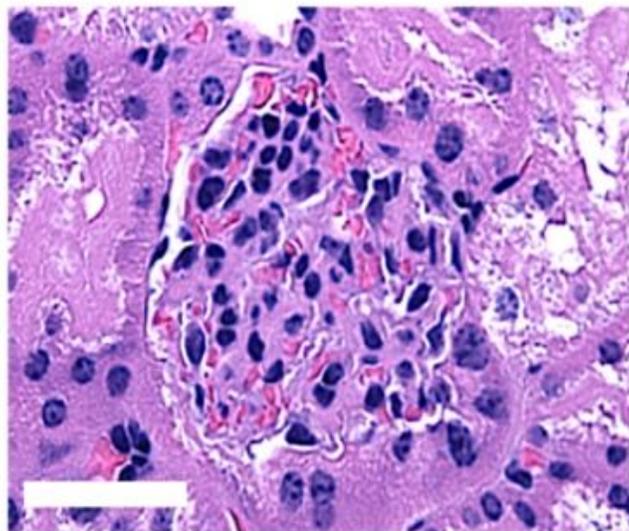
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IDO1-2



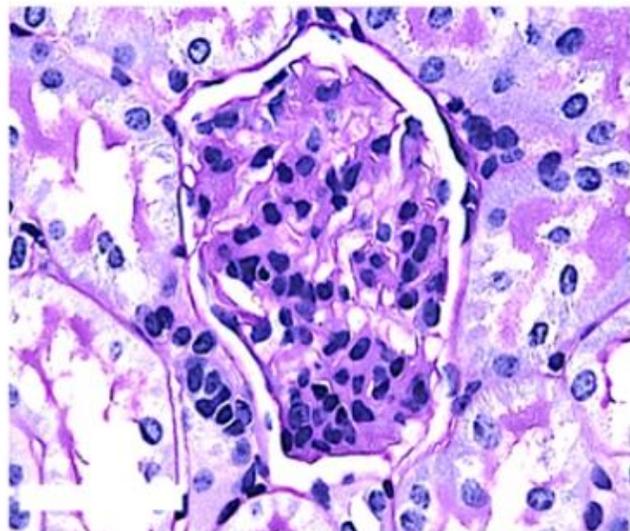


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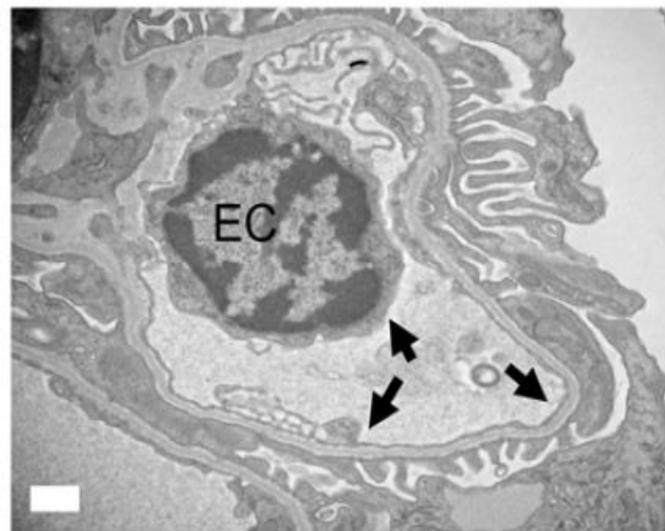
H&E



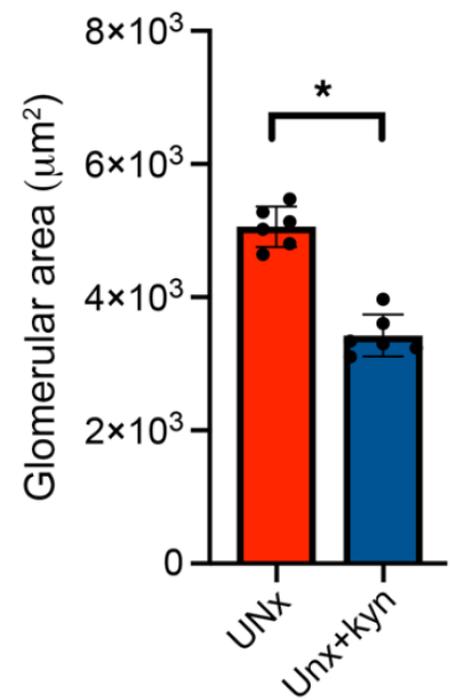
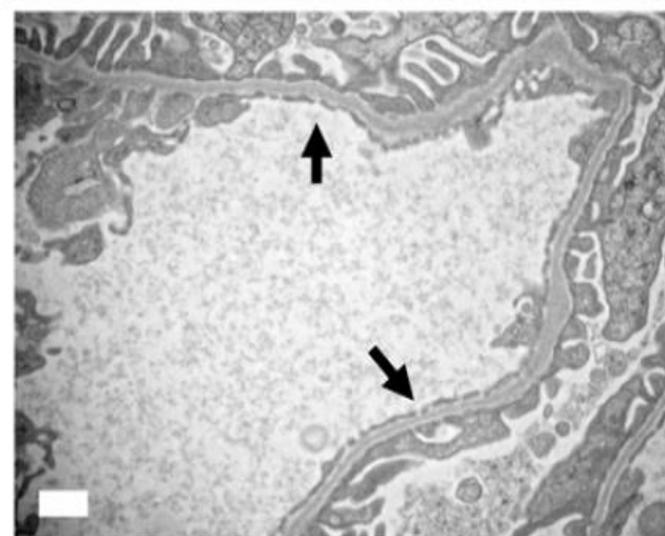
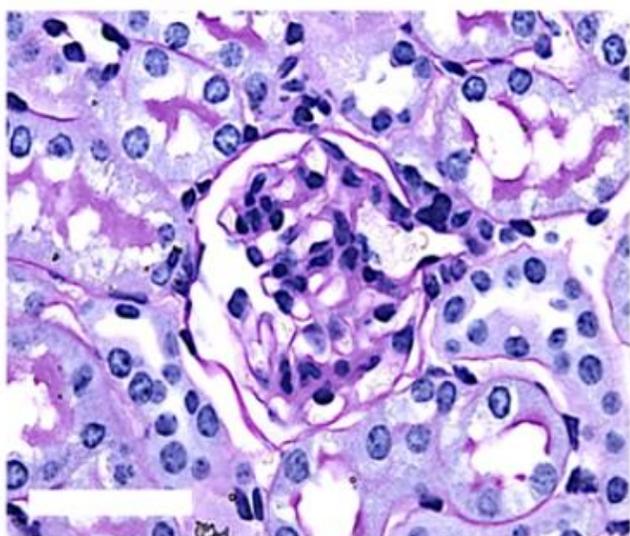
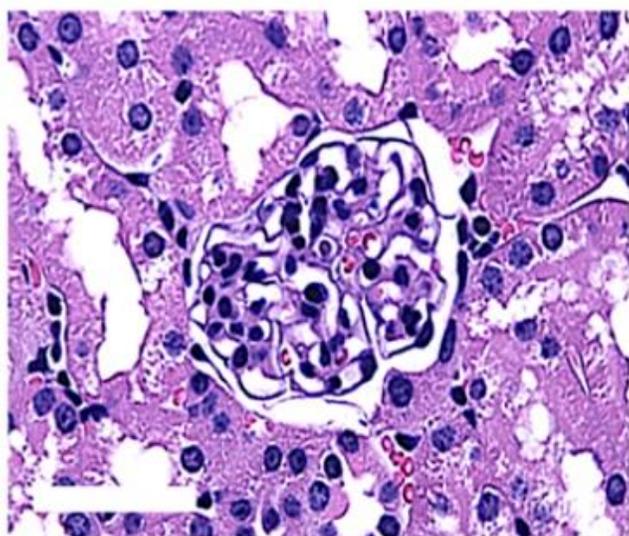
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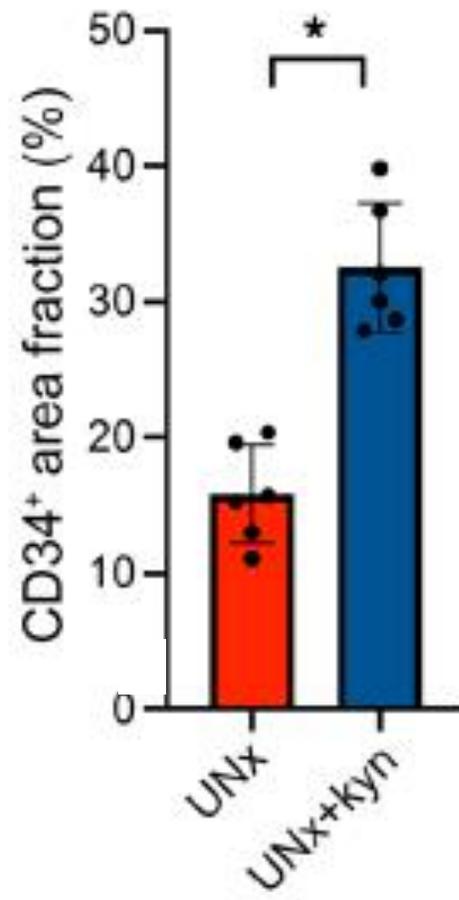
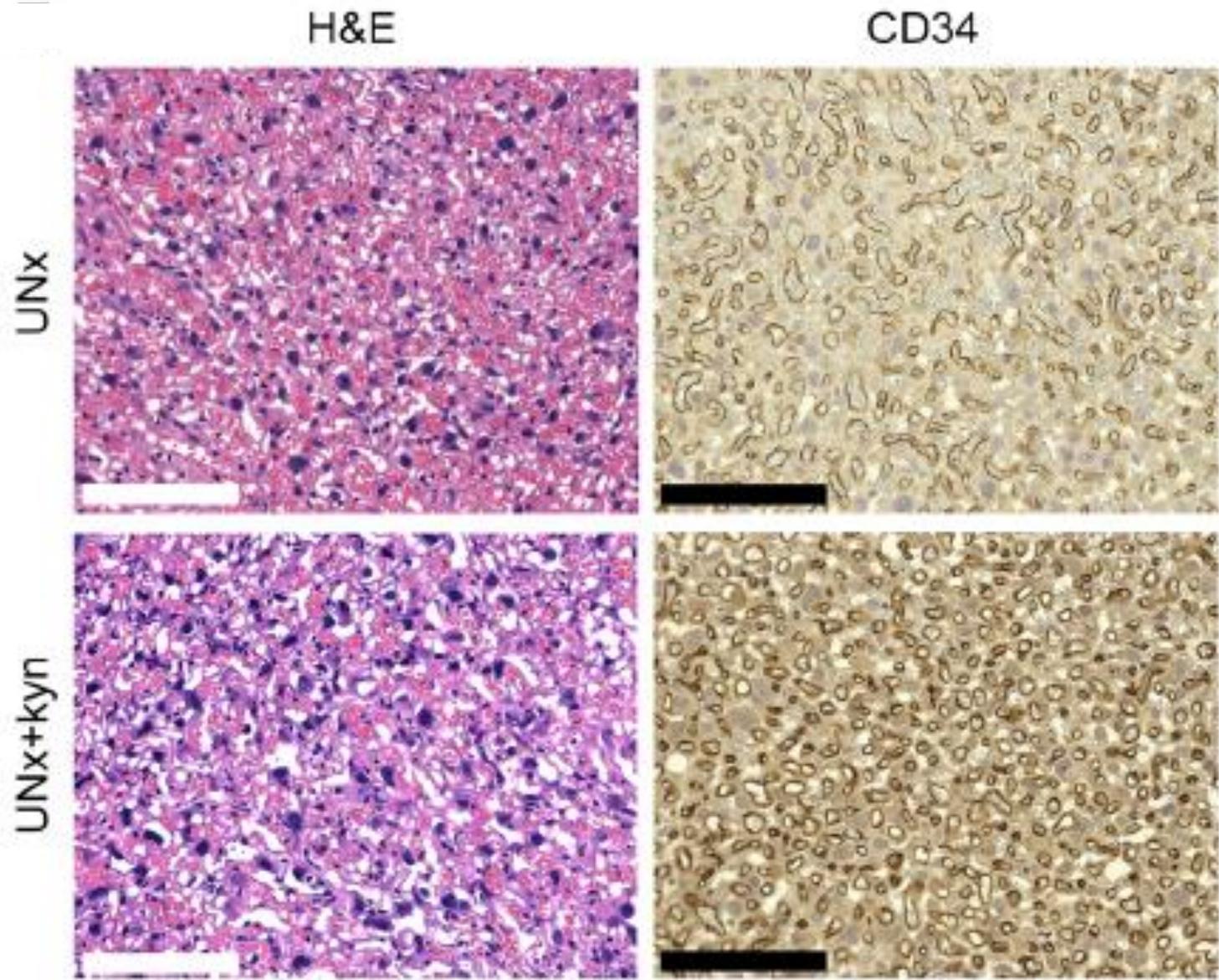


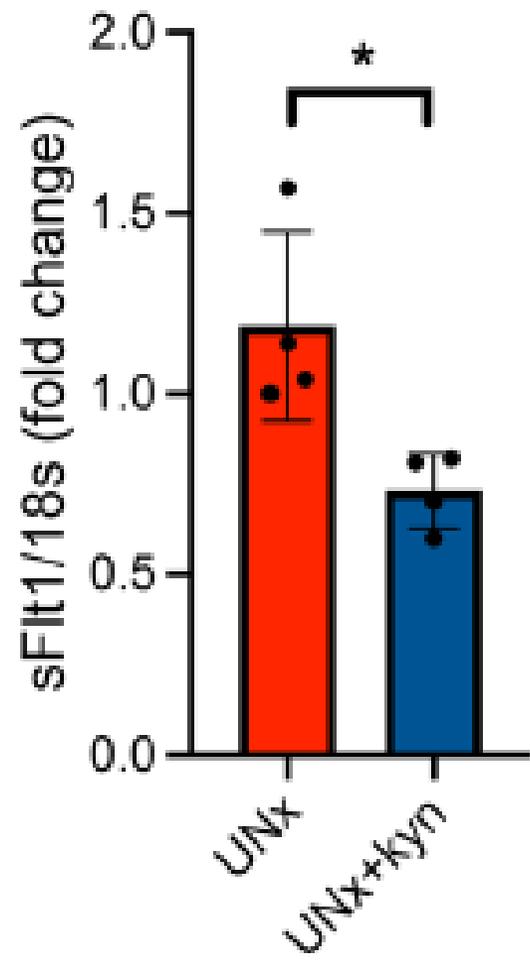
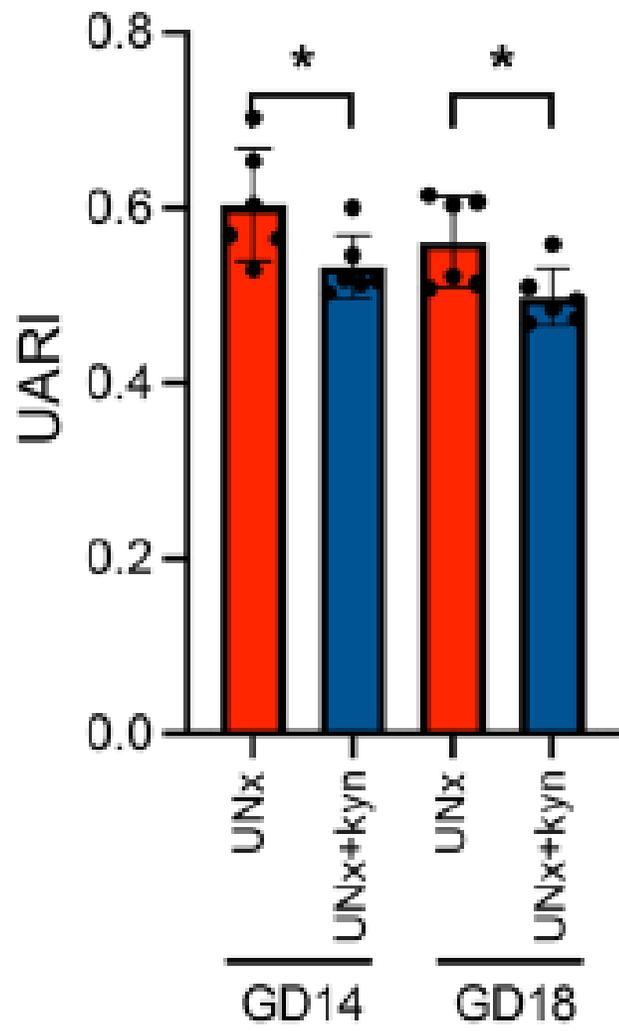
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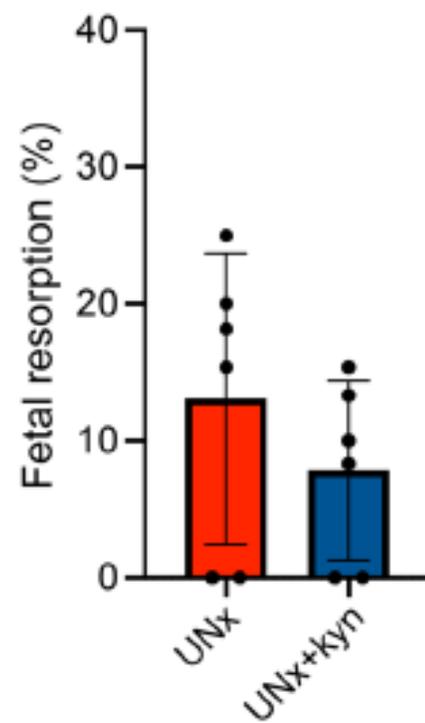
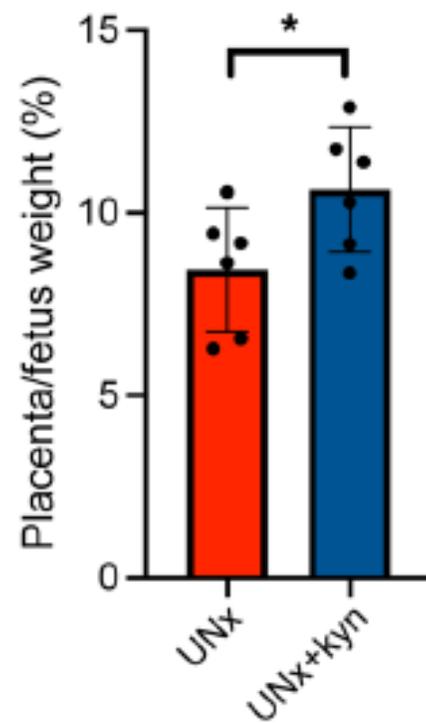
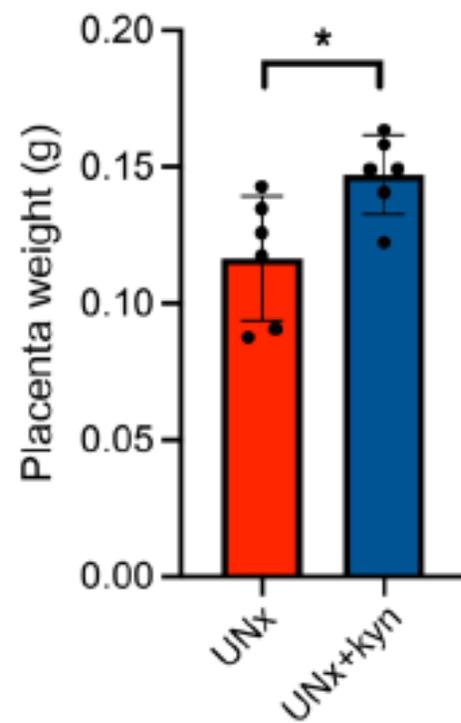
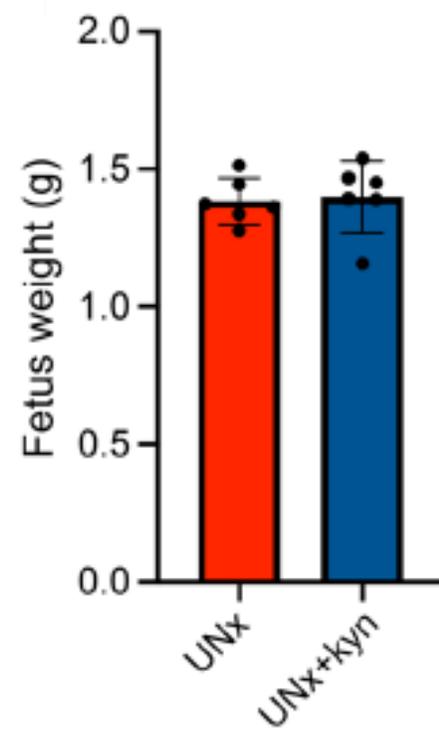
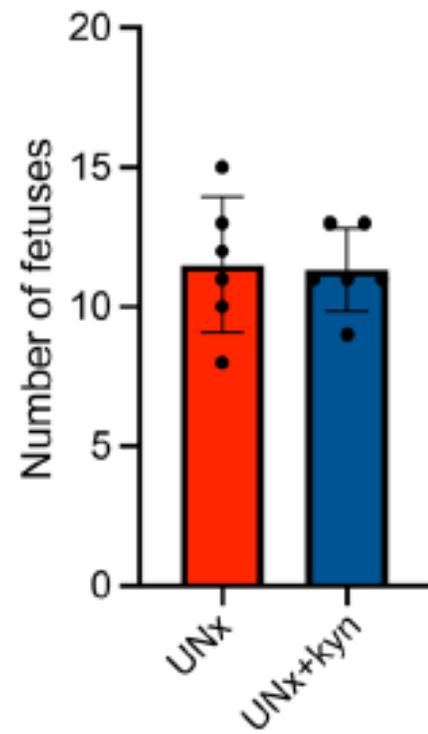


UNx+kyn

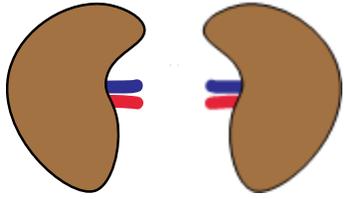








Pregnancy with 2 kidneys

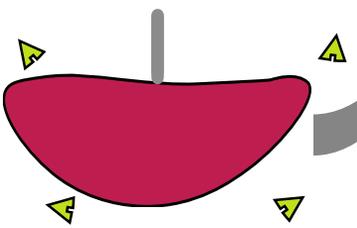


- ↑↑ GFR
- ↑↑ Plasma volume

- Normal blood pressure
- Normal proteinuria

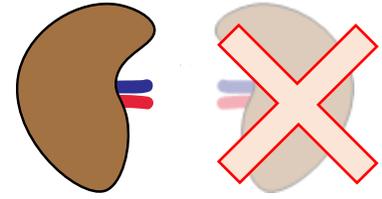
- ↑↑ Placental perfusion
- ↑↑ L-kynurenine
- Spiral artery remodeling

Healthy placentation



low placental sFLT1 production

Pregnancy with 1 kidney

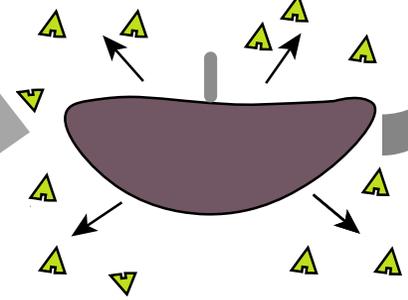


- ↑ GFR
- ↑ Plasma volume

- ↑ Blood pressure
- ↑ Proteinuria
- Maternal preeclampsia

- ↑ Placental perfusion
- ↑ L-kynurenine
- Impaired spiral artery remodeling

Impaired placentation



High placental sFLT1 production

Conséquences pratiques

Identifier les patientes / Consultation pré-conceptionnelle

Fonction rénale

Pression artérielle

PMA

Traitements

Régime

Informer / Conseiller / Planifier / Prévenir / Surveiller



Best case scenario(s)

A healthy baby is born at term, or near term, does not need hospitalisation in the NICU, does not need special care, and is discharged in good health with the mother.

The mother does not experience pregnancy-related complications, and her CKD is stable.

This best case scenario is almost the rule in women with CKD stage 1, without proteinuria and hypertension and without an active immunologic disease or KT.

It is possible in all CKD stages, but the chances are progressively reduced with kidney function impairment or comorbidity. 'Late pre-term' delivery (34–37 GW), in the absence of other problems may probably be considered as similar to term delivery.



Intermediate scenario(s)

A healthy baby is born pre-term, needs hospitalisation in the NICU, and is discharged after hospitalization.

The mother experiences pregnancy-related complications (hypertension, proteinuria or both), or her kidney function worsens.

This scenario is frequent in women with CKD 3–5, baseline proteinuria or hypertension, active immunologic disease or KT. Malformations are not increased in CKD but prematurity-associated comorbidity may be severe.

'Early preterm' (< 34 GW) and extremely preterm delivery (< 28 GW) increases with CKD stages. Risk of worsening of the kidney function and of hypertensive disorders of pregnancy is likewise increased. In advanced CKD dialysis may be needed.



Worst case scenario(s)

A severely growth-restricted very preterm baby dies *in utero*, few days after birth, or survives with disability. The mother's kidney function deteriorates and dialysis is needed in pregnancy or shortly thereafter. Maternal death is exceptional, but progression to kidney failure may reduce life expectancy.

This worst case scenario is extremely rare, but is possible, and this frightening possibility should be considered specifically in late CKD stages, with failing KT or active immunologic diseases.

While the literature is limited, the authors hold that the combination of advanced/severe CKD and history of previous hypertensive disorders of pregnancy bears the highest risks.