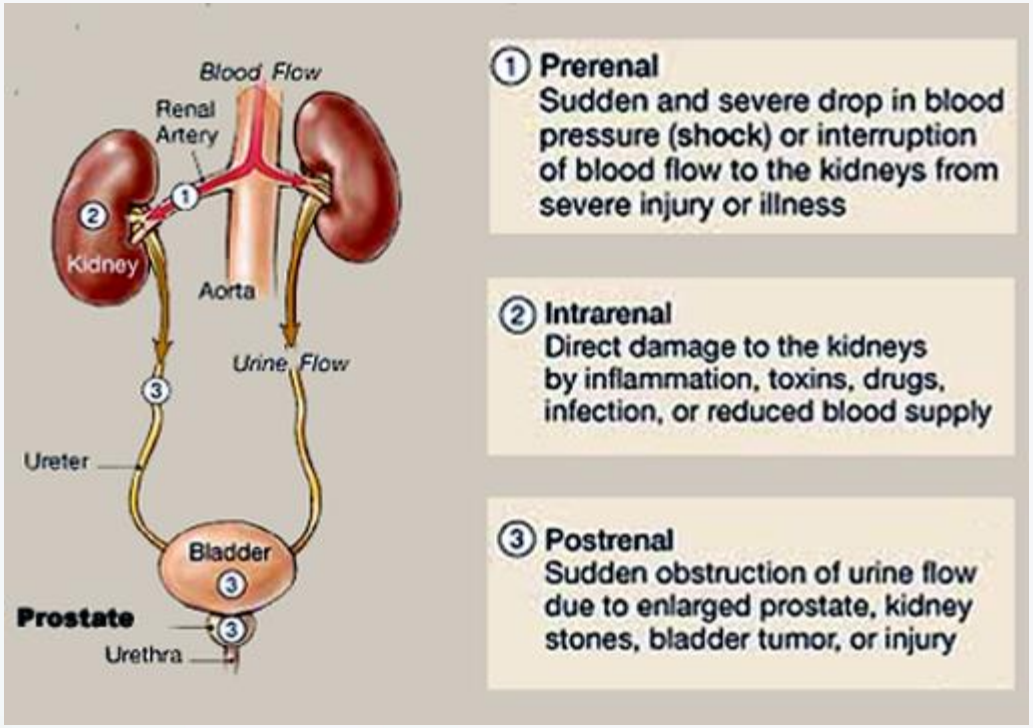
Introduction

Acute kidney injury (AKI)

- Definition
- Etiology

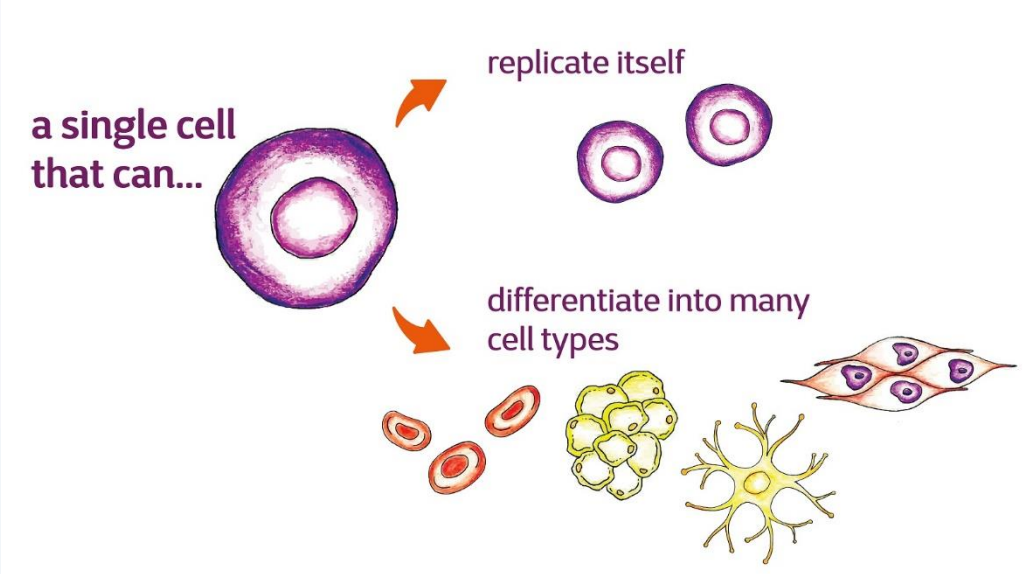


- Cisplatin-induced AKI
- Treatment (drug, dialysis, transplantation, stem cell)

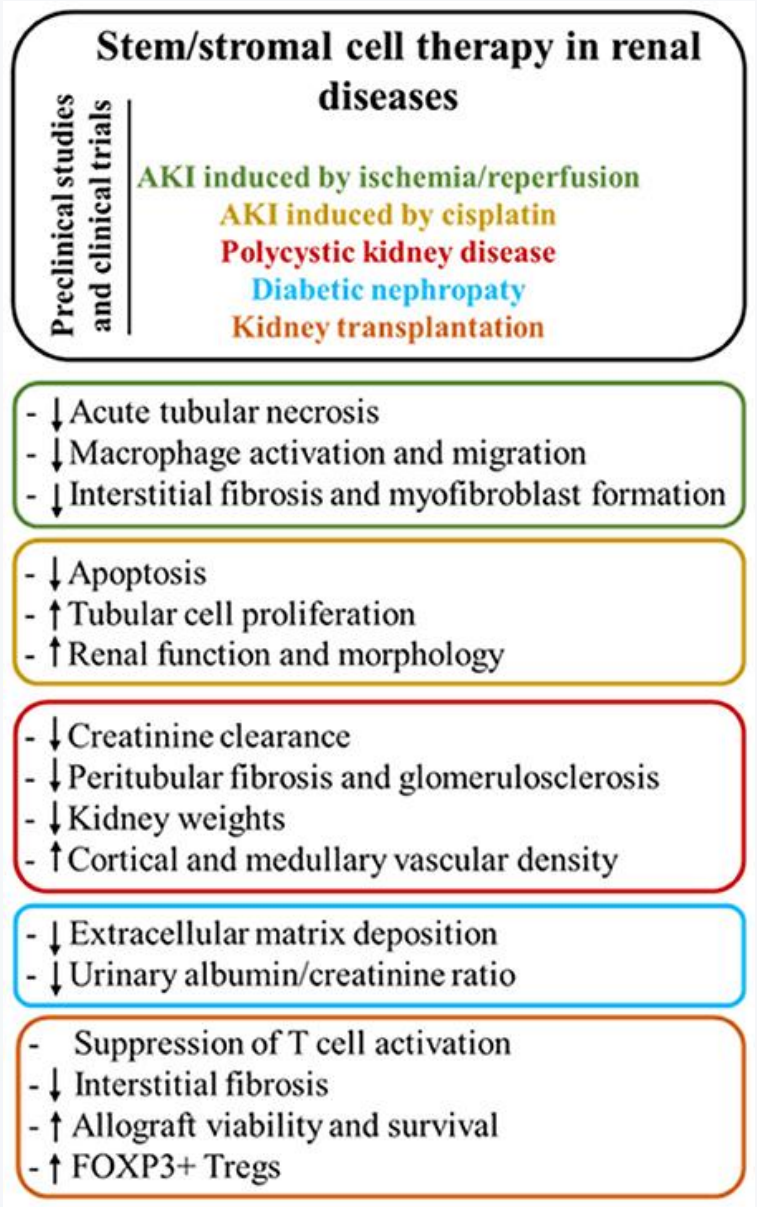
Stem cell-based therapy

Types:

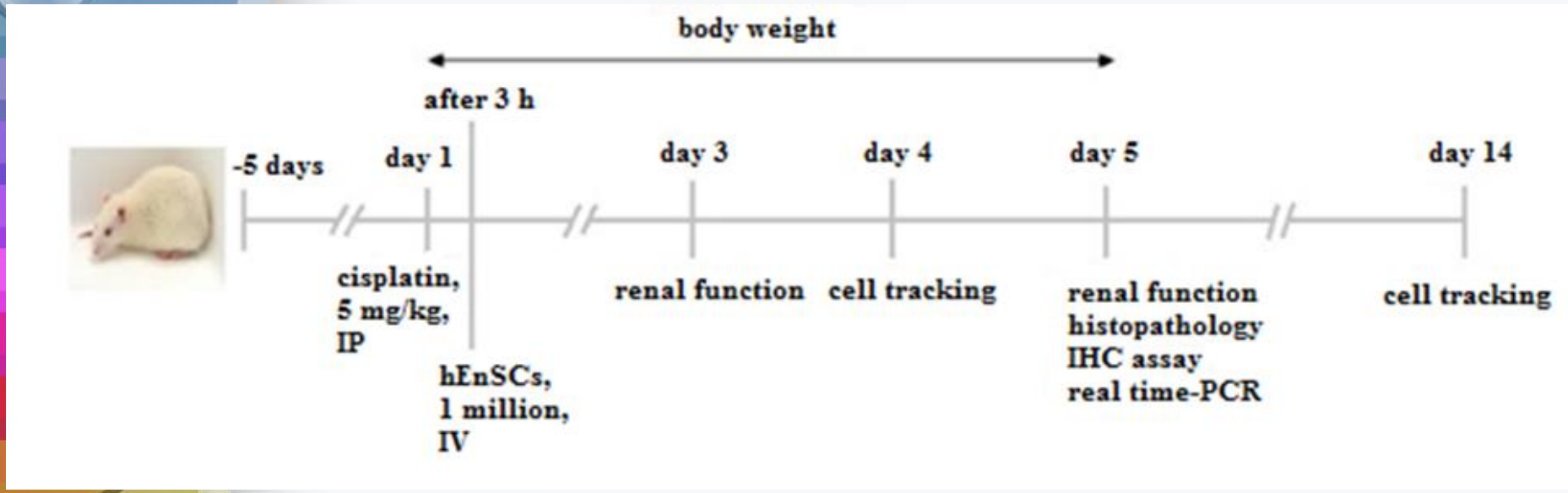
- Embryonic stem cells (ESCs)
- induced-pluripotent stem cells (iPSCs)
- Adult stem cells (ASCs)
- ✓ Endometrial stromal/stem cells (EnSCs)



Introduction



Materials & Methods

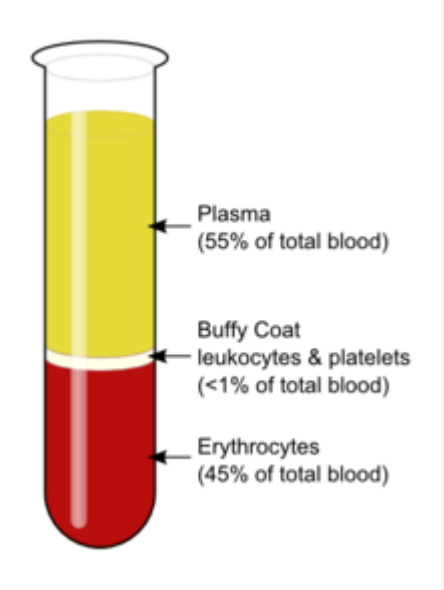


Groups

- Intact: No treatment
- Model: 5 mg/kg wb, IP
- PBS: 5 mg/kg wb, IP; 200 µl PBS, IV
- Cell: 5 mg/kg wb, IP; 1 million hEnSCs , IV

Biochemical markers of renal function

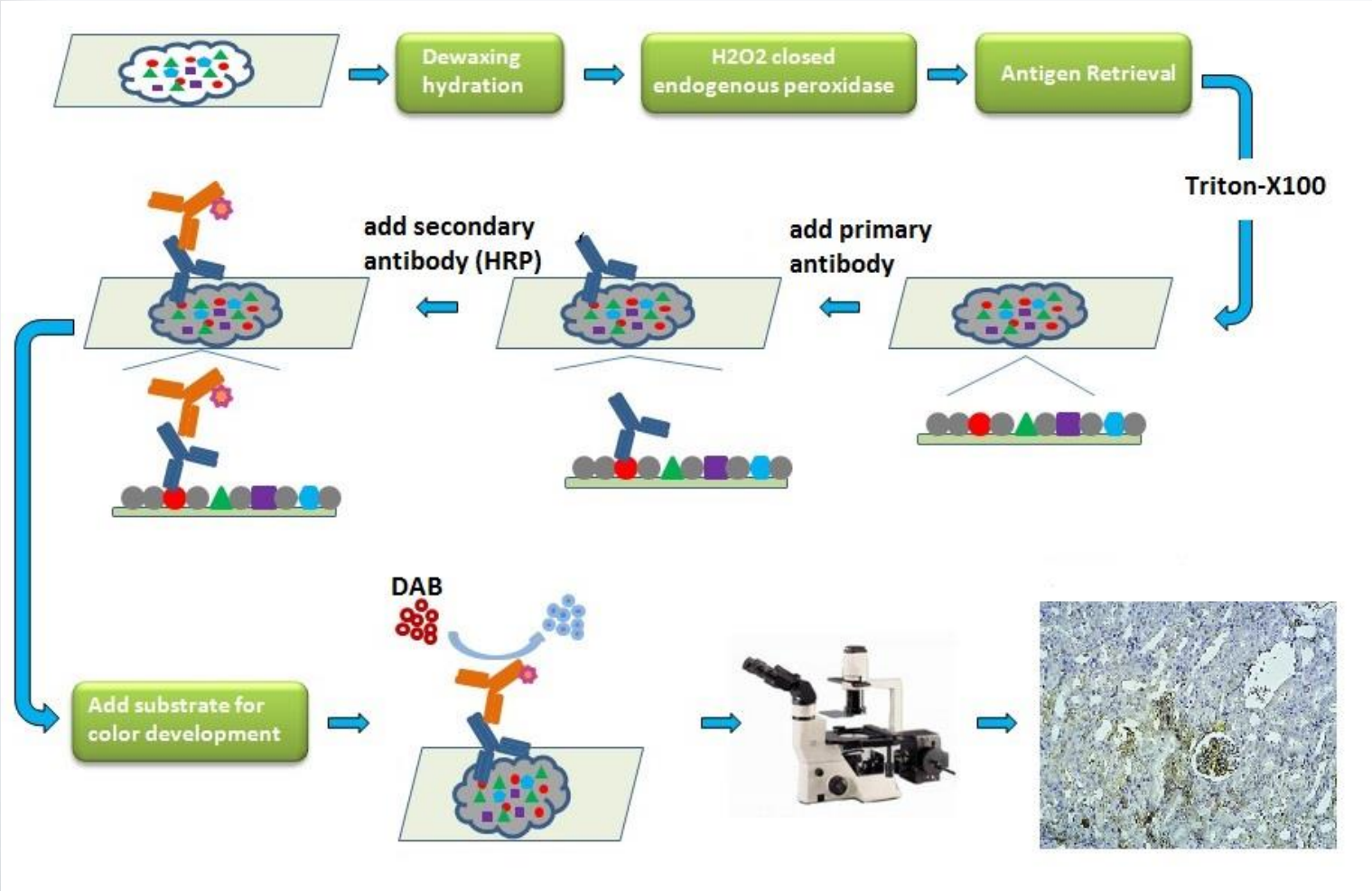
- Anesthesia with ketamine-xylazine
- Blood collection from the heart
- Clotting at room temperature
- Centrifuge (3000 rpm, 10-15 min)
- Separation of serum
- Measurement of BUN, SCr, Na and K



Renal histology

Steps	Solution
Deparaffinization and rehydration	Xylene I Xylene II Absolute alcohol 90% alcohol 70% alcohol Water wash
Staining	Hematoxylin Water wash Eosin Water wash
Dehydration	70% alcohol 90% alcohol Absolute alcohol Xylene I Xylene II

Immunohistochemical staining of Ki-67

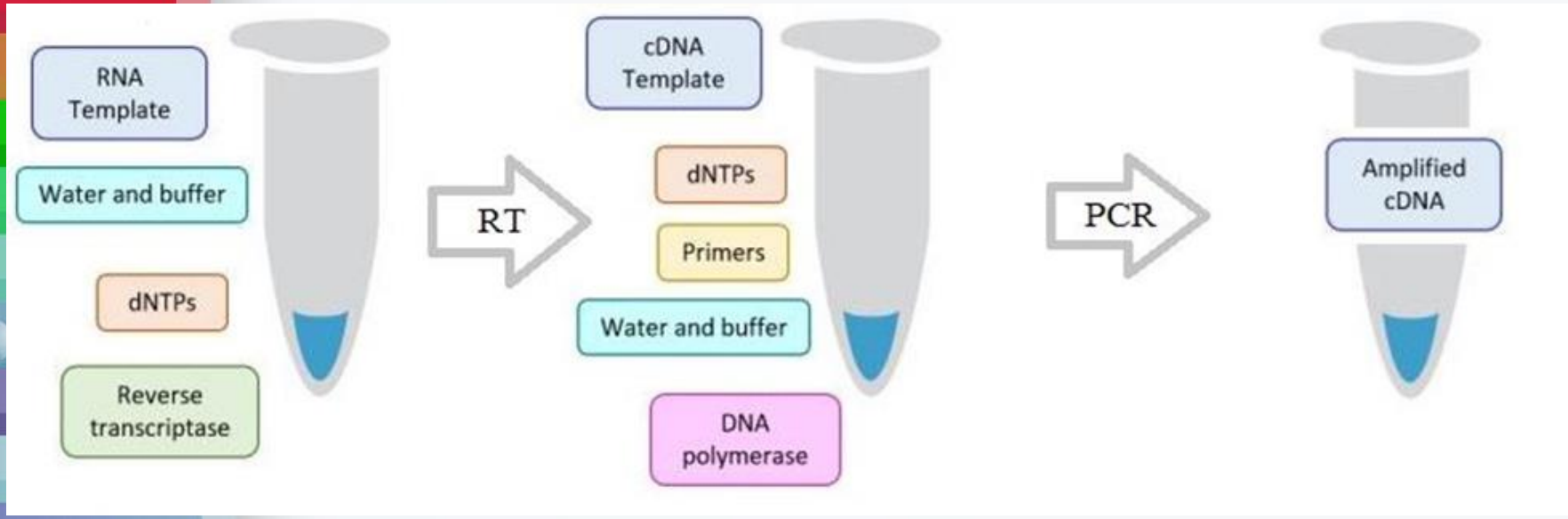


RT-qPCR

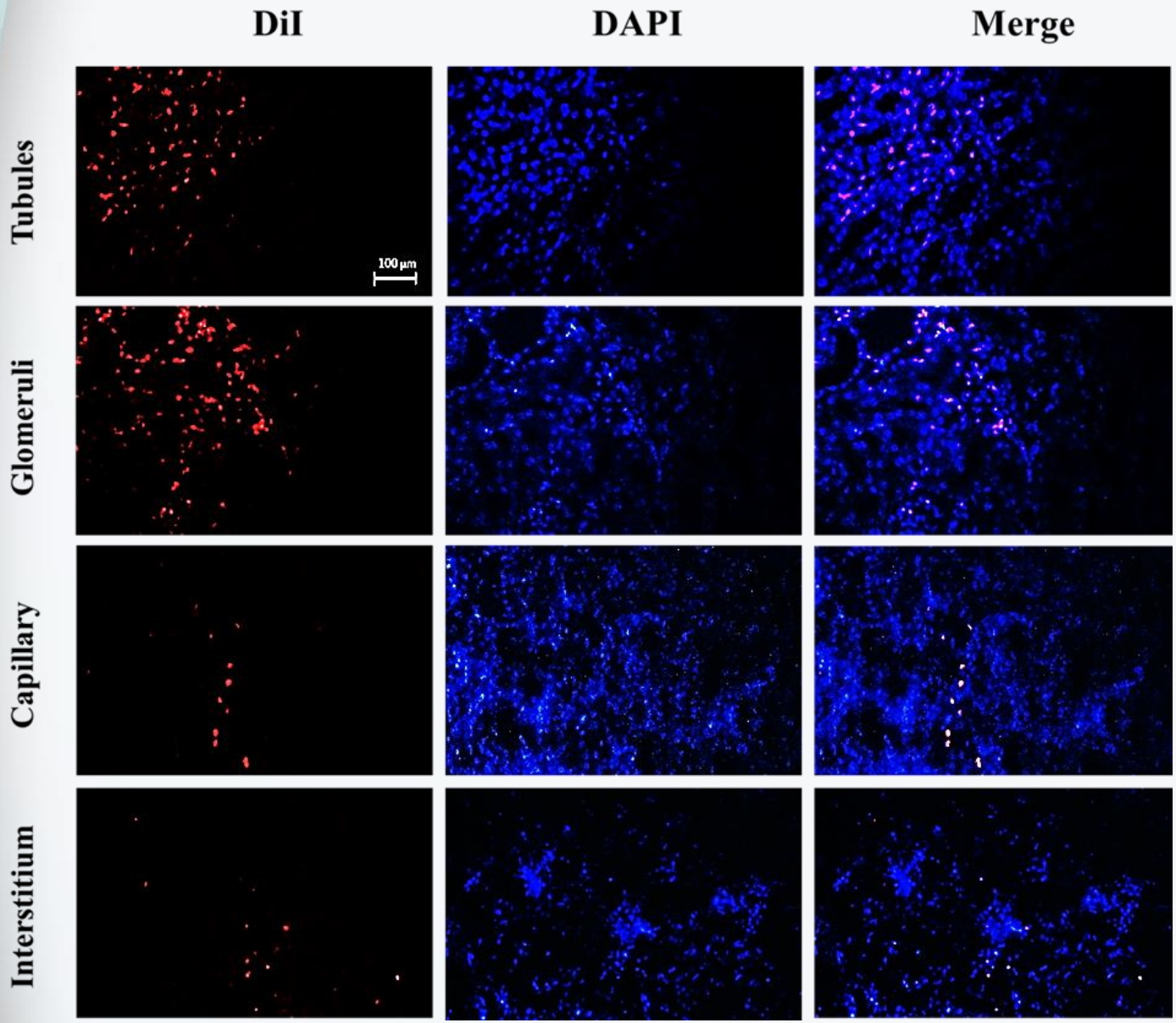
Two-step

1- Total RNA extraction and cDNA synthesis

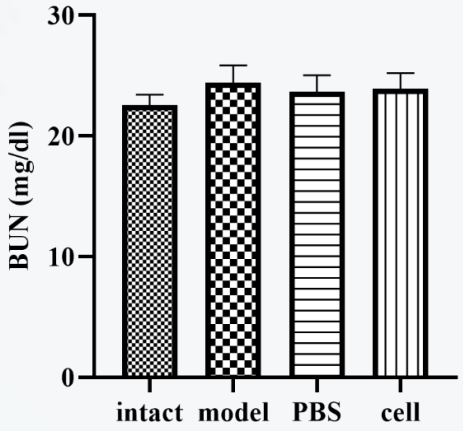
2- qPCR



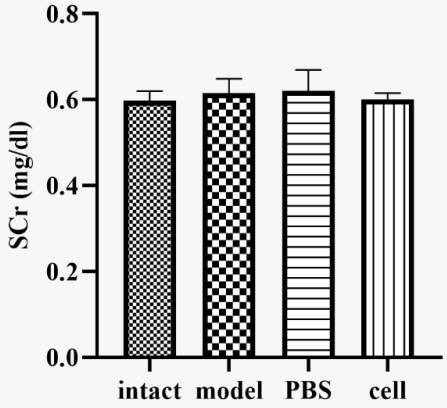
Results, cell tracking in kidney



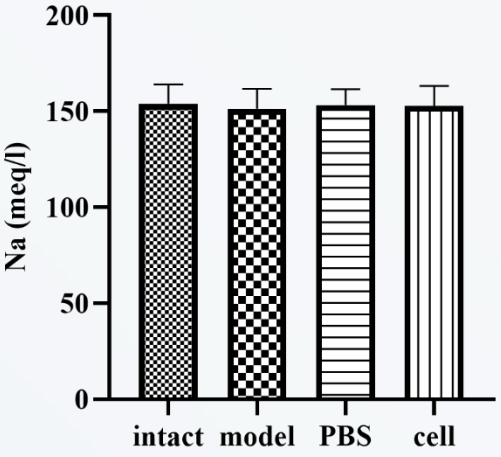
Results, renal function (day 3)



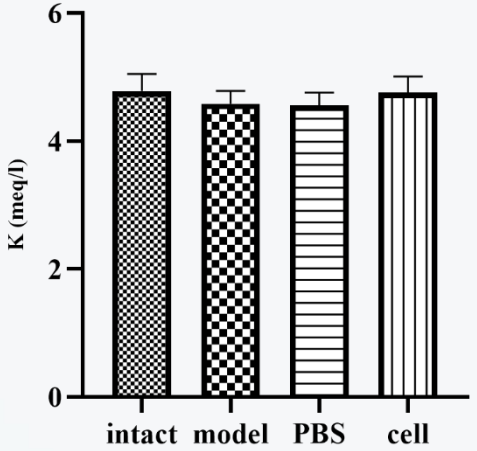
BUN-day 3



SCr-day 3



Na-day 3



K-day 3

Discussion, biochemical markers of renal function

Researchers	Year	Cause of injury	Results	Cell therapy	Results
Mostafa *et al.*	2016	Cisplatin (5 mg/kg, day 4)	↑BUN, SCr	5 million MSC	↓ BUN, SCr
Lim *et al.*	2016	Cisplatin (dog, day 4)	↑BUN, SCr, Na ↓K	1 million BM-MSC	↑BUN, SCr ↓Na, K
Moghadasali *et al.*	2014	Cisplatin (5 mg/kg, monkey)	↑Urea, SCr, K ↓Na	5 million/ 1 Kg WB Autologous BM-MSC	↓Urea, SCr, K ↑Na
Zeinali *et al.*	2021	Cisplatin (5 mg/kg, day 5)	↑BUN, SCr ↓Na, K	1 million Xenogeneic hEnSC	↓BUN, SCr ↑Na, K

Discussion, histological analysis

- ✓ Moghadasali et al. (2014): Cisplatin caused significant changes in the renal histology of the **monkey** on day 4. Injection of BM-MSCs into renal artery on days 4 and 28 had no significant effect on pathological scores, hyaline casts, and fibrosis scores.
- ✓ Lim et al. (2016): In **dogs**, BM-MSCs decreased fibrotic changes significantly, but this was not the case for tubular and glomerular injuries.
- ✓ Sun et al. (2019): Injection of urine-derived stem cells resulted in a significant decrease in the tubular and glomerular damage in **rats** with cisplatin (5mg/kg)-induced AKI on day 4.

Transplantation of hEnSCs significantly reduced the rate of cast formation and also decreased pathological scores on day 5.

- ✓ Differences in effects suggest differences in the behavior of stem cells and their regenerative potential between species.

Thanks for your attention