expression of a plurality of nucleic acids and/or protein as markers for the viable nephron and/or ureteric epithelial progenitor cells.

In one example, the disclosure provides isolated, enriched or purified nephron and/or ureteric epithelial progenitor cells produced according to the method as disclosed herein.

In yet another aspect, the invention provides a method of producing **a** kidney, or kidney cells or tissues, said method including the step of (i) performing the method of the present invention to produce nephron progenitor cells and ureteric epithelial progenitor cells; (ii) differentiating the nephron progenitor cells and ureteric epithelial progenitor cells to thereby produce the kidney, or kidney cells or tissues.

In some examples, the nephron progenitor cells and/or ureteric epithelial progenitor cells may be used as a source for bioprinting or bio-engineering whole kidneys and kidney tissue for kidney transplant or treating chronic kidney disease.

In other examples, the nephron progenitor cells and/or ureteric epithelial progenitor cells may be used for the recellularisation of whole organ decellularised kidney to thereby create a reconstituted or replacement kidney.

In other examples, the nephron progenitor cells and/or ureteric epithelial progenitor cells may be used as a source for cellular therapy of kidney diseases and conditions.

In a further aspect, the invention provides a method of determining the nephrotoxicity of one or a. plurality of compounds, said method including the step of (i) performing the method of the present invention to produce nephron progenitor cells and ureteric epithelial progenitor cells; (ii) contacting the one or plurality of compounds with the nephron progenitor cells and ureteric epithelial progenitor cells, or kidney cells or tissues differentiated or otherwise obtained therefrom, to thereby determine whether or not the one or plurality of compounds is nephrotoxic.

In one example, this aspect provides bioprinting of the nephron progenitors and/or ureteric epithelial progenitors into kidney organoids for nephrotoxicity screening is disclosed.

BRIEF DESCRIPTION OF THE FIGURES

Figure 1. Sequential differentiation of posterior primitive streak and intermediate mesoderm from human embryonic stem cells. **a,** Schematic of developmental stages from inner cell mass to renal lineages. Genes shown in each stage represent specific markers of that stage. b, FACS analysis (GFP and forward scatter (FSC)) showing

24. A method of producing a kidney, or kidney cells or tissues, said method including the step of

(i) performing the method of any one of claims 1 to 23 to produce nephron progenitor cells and ureteric epithelial progenitor cells;

(ii) differentiating the nephron progenitor cells and ureteric epithelial progenitor cells to thereby produce the kidney, or kidney cells or tissues.

25. A method of determining the nephrotoxicity of one or a plurality of compounds, said method including the step of

(i) performing the method of any one of claims 1 to 23 to produce nephron progenitor cells and ureteric epithelial progenitor cells;

(ii) contacting the one or plurality of compounds with the nephron progenitor cells and ureteric epithelial progenitor cells, or kidney cells or tissues differentiated or otherwise obtained therefrom, to thereby determine whether or not the one or plurality of compounds is nephrotoxic.

26. The method of Claim 25, wherein the method of determining the nephrotoxicity of one or a plurality of compounds is performed by contacting the one or plurality of compounds with a renal organoid.

27. The method of Claim 1, that includes the step of contacting IM cells with:

(a) fibroblast growth factor 9 (FGF9) and/or fibroblast growth factor 20 (FGF20); and

(b) one or more selected from the group consisting of: heparin; a Wnt agonist; retinoic acid (RA), analog or agonist; and an RA antagonist.