WHAT IS CLAIMED IS:

1. An *in vitro* method of predicting toxicity of a compound in a specific cell type, the method comprising:

contacting a test compound, for which toxicity is to be assessed and for which the ability to activate NF-κB or to induce NF-κB nuclear translocation is not known prior to performing the method, with a test population of cells of the specific cell type in which nuclear factor (NF)-κB has not been activated prior to said contacting;

determining nuclear localization levels of NF-κB in the test population subsequent to said contacting;

comparing the nuclear localization levels of NF-κB in the test population with nuclear localization levels of NF-κB in a control population of cells of the specific cell type that has not been contacted with the test compound; and

predicting, based on an increase in nuclear localization levels of NF-κB in the test population relative to the control population, that the test compound is toxic for the specific cell type.

2. The method of claim 1, wherein the NF-κB is the p65 subunit of NF-κB.

3. The method of claim 2, wherein the p65 subunit of NF-κB comprises the sequence set forth in any one of SEQ ID NOs: 1 to 4.

4. The method of claim 2, wherein the p65 subunit of NF-κB comprises the sequence set forth in SEQ ID NO: 5 or 6.

5. The method of any one of claims 1 to 3, wherein the cells of the test population and control population are human cells.

6. The method of any one of claims 1, 2 and 4, wherein the cells of the test population and control population are non-human animal cells.

7. The method of any one of claims 1 to 6, wherein the cells of the test population and control population comprise stem cells.

8. The method of claim 7, wherein the stem cells comprise embryonic stem cells, mesenchymal stem cells, hematopoietic stem cells, induced pluripotent stem cells, tissue-specific stem cells, or organ-specific stem cells.

9. The method of any one of claims 1 to 6, wherein the cells of the test population and control population comprise somatic cells or cells derived from stem cells.

10. The method of claim 9, wherein the cells comprise tumour cells.

11. The method of claim 9, wherein the cells comprise primary cells.

12. The method of claim 9, wherein the cells comprise liver cells, kidney cells, cardiovascular cells, central nervous system cells, skin cells, lung cells, pancreatic cells, digestive tract cells, eye cells, ear cells, bone marrow cells or blood cells.

13. The method of claim 9, wherein the cells comprise renal proximal tubular cells.

14. The method of claim 13, wherein the renal proximal tubular cells are human primary renal proximal tubular cells.

15. The method of claim 9, wherein the cells comprise cells from an established cell line.

16. The method of claim 15, wherein the cells are HK-2 cells, or LLC-PK1 cells.

17. The method of claim 9, wherein the cells comprise cells derived from stem cells which are differentiated from embryonic stem cells, mesenchymal stem cells, induced pluripotent stem cells or organ/tissue-specific stem cells.

18. The method of claim 17, wherein the cells are at least partially differentiated to resemble liver cells, kidney cells, cardiovascular cells, central nervous system cells, skin cells, lung cells, pancreatic cells, digestive tract cells, germ cells or their precursors, eye cells, ear cells, bone marrow cells or blood cells.

19. The method of claim 18, wherein the cells are renal proximal tubular-like cells.

20. The method of any one of claims 1 to 19, wherein said contacting is performed over a period of time of from 1 hour to 16 hours, from 12 hours to 16 hours, or from 30 to 36 hours, or for 3 days.

21. The method of any one of claims 1 to 20, further comprising repeating said contacting one or more times, at regular intervals over a total time period of up to 4 weeks, prior to said determining, including wherein said contacting is performed for the same time period for each occurrence of said contacting.

22. The method of any one of claims 1 to 20, further comprising repeating said contacting followed by said determining one or more times, at regular intervals over a total time period of up to 4 weeks, including wherein said contacting is performed for the same time period for each occurrence of said contacting.