# Methods for In Vivo Stimulation of Erythropoietin Production

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## Technology description

**Summary**

This invention discloses an approach whereby the administration of a synthetic organic compound specifically induces proliferation of erythropoietin-producing peritubular interstitial cells in the kidney, which results in increased synthesis of erythropoietin. After cessation of treatment with the synthetic compound, there is persistence of EPO-producing peritubular interstitial cells in the kidney, with no apparent adverse effect on kidney function. This the first model where such a striking proliferation of EPO-producing peritubular interstitial cells has been achieved by the administration of an apparently non-toxic substance.

Erythropoietin is produced in the adult kidney to maintain a constant level of hematocrit. Decreased EPO production results in anemia, often associating with a host of chronic and life-threatening conditions. While EPO production is stimulated by hypoxia and by various compounds, these compounds generally lack therapeutic feasibility. In addition, the only option available for the treatment of anemia and the associated is the administration of recombinant human EPO (rHuEPO), which is very expensive. Thus there is a need to explore alternative and more economical approaches to induce native erythropoietin production in the kidney and to treat erythropoietin-responsive anemias.

**Related Research:**

Kishore BK, Isaac J, Westenfelder C. Administration of poly-D-glutamic acid induces proliferation of erythropoietin-producing peritubular cells in rat kidney. Am J Physiol Renal Physiol 292:F749-F761, 2007

Kishore, B.K.,, et. al. "A Novel Method of Induction of Proliferation of Erythropoietin (EPO)-Producing Peritubular Cells in Rat Kidney", 36th Ann. Mtg. Am. Soc. Neph.; San Diego, CA (Nov. 2003): SU-PO424.

Kishore, B.K., et. al. "Poly-D-glutamic acid induces an acute lysosomal thesaurismosis of proximal tubules and a marked proliferation of interstitium in rat kidney", Lab. Invest. 74(6): 1013-23, 1996.

## Advantages

Represents a practical alternative to EPO production
Affords the opportunity to identify other molecules that induce EPO production
Allows the development of clinically relevant strategies for the treatment of EPO-responsive anemias using biomedical and biotechnological approaches

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