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Clofarabine: A Success Story

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Nucleoside analogues are widely used in the treatment of cancer, viral infection and autoimmune disease. Whilst their profiles vary significantly, the clinical utility of anticancer nucleosides is frequently constrained by their side effects.

Clofarabine (Evoltra/Clolar) was rationally designed to enhance efficacy, broaden clinical utility and improve the side effect profile. Key design attributes included: resistance to deamination; inhibition of phosphorylytic cleavage, and greater acid stability. These adaptations significantly reduce both the clearance of the parent drugs and the generation of toxic halogenated nucleobases.

In non clinical studies, clofarabine behaved differently from its predecessor compounds, and early indications of its clinical potential were evident. However, the pharmaceutical industry perceived it as being too similar (in structure) to agents already in common use and in a market too small for profitable development.

Clofarabine's commercial development took place at the time of major international events which adversely affected the financing of start-up biotech companies. Nevertheless, clofarabine was taken from 'bench to market' in record time, with minimum spend. It was the first drug to be successfully developed specifically for the treatment of paediatric leukaemia in decades. The company that developed it has become a success model for the biopharmaceutical industry.