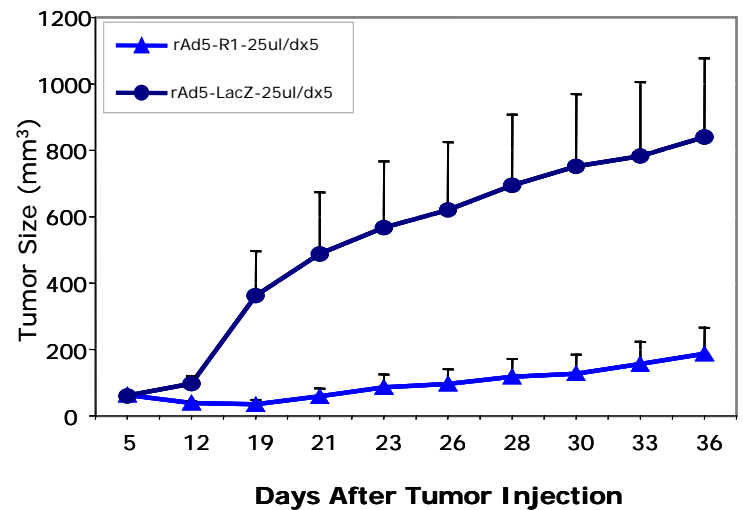


**B: Growth of human colon adenocarcinoma (Colo320 HRS) in CD-1 nude mice following *ex vivo* treatment with rAd5-R1.**



**C: Growth of human colon adenocarcinoma (Colo320 HRS) in CD-1 nude mice following *in vivo* treatment with rAd5-R1.**

## Patent Protection

- ▶ Issued patents in the US, Europe (includes UK, Germany, France, Spain and Italy), Australia, Hong Kong and Singapore.
- ▶ Patent applications are pending in Canada, U.S., and Japan.

## Technology Validation

Lorus' research activities aimed at development of adenovirus-mediated R1 gene therapy have culminated in a number of peer-reviewed publications as well as an editorial commentary describing its novelty and scientific significance. These publications are representative of Lorus' commitment to building a strong R&D program based on R1-gene therapy.

### Refereed Papers

1. Cao MY et al., Adenovirus-mediated ribonucleotide reductase R1 gene therapy of human colon adenocarcinoma. *Clin Cancer Res.* 2003 Oct 1; 9(12): 4553-61.
2. Yen Y., Ribonucleotide reductase subunit one as gene therapy target: commentary re: M-Y. Cao et al., Adenovirus-mediated ribonucleotide reductase R1 gene therapy of human colon adenocarcinoma. *Clin Cancer Res.* 2003 Oct 1; 9(12): 4304-8.
3. Fan H, et al., The R1 component of mammalian ribonucleotide reductase has malignancy-suppressing activity as demonstrated by gene transfer experiments. *Proc Natl Acad Sci U S A.* 1997 Nov 25; 94(24):13181-6.
4. Fan H, et al., Suppression of malignancy by the 3' untranslated regions of ribonucleotide reductase R1 and R2 messenger RNAs. *Cancer Res.* 1996 Oct 1; 56(19): 4366-9.

## Market Opportunity

***Cancer gene therapy may be considered a major application of gene therapy with a potential market estimated to be worth billions of US dollars.***

The safety profile for cancer gene therapy has been encouraging to date, with no patient deaths related to therapy. Cancer gene therapy will likely become an important component in an emerging paradigm in cancer treatment that is defined by a multimodal approach to disease management. Current treatments for most common cancers involve a combination of treatments including surgery, chemotherapy, immune therapy and radiation. Gene therapy may improve outcomes by increasing responses to these therapies. There is already evidence of this with the demonstration of synergy between p53 replacement and radiotherapy and chemotherapy. It is also likely that novel therapies will be developed that combine elements from cancer gene therapies including suicide gene transfer, immune modulation, and modulation of defective cancer genes.

## Partnering / Cooperation Options

Currently, Lorus is exploring the potential for expanded preclinical development of RNR-R1 gene therapy. As such, we are interested in exploring novel technologies for gene transfer (viral/non-viral vector versus physical DNA transfer technologies) as well as providing therapeutically relevant options for administration (direct injection into tumors or intravenously).

Lorus is seeking industrial partners interested in further development of this technology. Furthermore, Lorus is interested in pursuing academic and research institute collaborations for assessing novel applications with potential for subsequent preclinical development. We welcome a partner who brings expertise and funding for further development of our novel gene therapy.

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