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### I. History

- '18. 1 US Patent of VBP Gene Vector & its Anti-Cancer Drug(ACD)
- '18. 10 US Patent of X Polymer Gene Vector & its Anti-Cancer Drug
- '19. 4 Foundation of ELBIO Inc. at Seoul National University
- '19. 9 Funded by Korean Governmental Initial Foundation Package Business
- '19.11 Guaranteed by K. Governmental U-Tech Valley Business(US\$ 2million)
- '19.11 Designated as a Venture Co. by Korea Tech. Finance Corp.
- '19.11 ELBIO Institute was established by KOITA
- '20.1~ Gene Carrier is synthesized in GMP of a pharmacy co.
- '21.5 CEO (Jong Hoon Chung) received a prize from the President of Korean Government
- '21.6~ Funded by Korean Governmental Start-up Business Package
- '22.10 The first Prize in the 4<sup>th</sup> Tour of Gwanak S Valley Demoday
- '23.02 CEO(Jong Hoon Chung) received a Medal from the President of Korean Government as he worked for the University more than 33 years

### II. siRNA Nano Anti-Cancer Drug

1. ELBIO Inc. is a venture company in a campus town of Seoul National University to develop the targeted **siRNA nano anti-cancer drugs** using a **gene vector** developed and siRNA for killing cancer cells and cancer stem cells.

2. ELBIO Inc. developed a **non-virus gene vector** based on a xylitol polymer and has used for developing anti-cancer drugs as a platform.

3. This gene vector is so hyperosmotic, that it can penetrate blood brain barrier(BBB) and blood tumor barrier(BTB). It is so effective in treating solid cancers of brain cancer, lung cancer, etc. because of high transfection efficiency and low cytotoxicity.

4. The mechanism of the nano anti-cancer drug using a gene(siRNA) is that 1) the targeted gene vectors target cancer cells, and then 2) the siRNA loaded gene vectors inhibit the creation of DNA, finally 3) cancer cells are eliminated

by apoptosis. And to kill cancer stem cells, a special peptide coupled gene vectors target cancer stem cells and then 2) An another siRNA loaded gene vectors inhibit the self-renewal of cancer stem cells, finally 3) cancer stem cells are eliminated by apoptosis. Hence, ELBIO Inc. can treat cancers completely by killing cancer cells and cancer stem cells simultaneously.

5. In mouse back, this anti-cancer drug with a gene(siRNA) reduced the tumor volume size of human lung cancer by about 80% after 30 day treatment.

6. ELBIO Inc. found out that the CRISPR-Cas9 loaded gene carrier could treat the cancer stem cells faster.

7. As ELBIO Inc. developed a mouse brain tumor model, the anti-cancer drug of nano particles reduced the brain tumor volume size by ave. 65%, and the anti-cancer drug of nanochain type reduced the tumor size by ave. 87% after 2 week treatment.

8. ELBIO Inc. is developing an immune anti-cancer drug, which can be simultaneously used for gene therapy with siRNA. So we can treat cancers with high effectiveness.

9. This siRNA nano anti-cancer drug can replace the immune anti-cancer drugs with low effectiveness of ~30% and side effects. Hence, ELBIO Inc. can share the world market of anti-cancer drugs with novel siRNA anti-cancer drugs using polymer vectors developed.

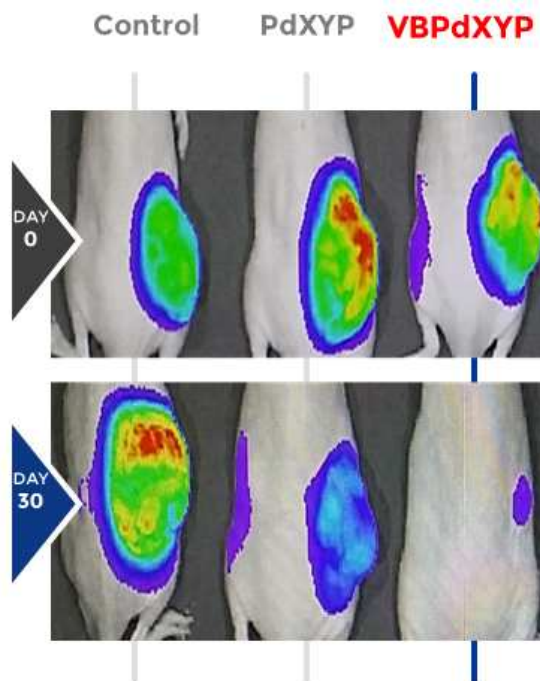


Fig. 1. Treatment effects of a siRNA nano anti-cancer drug on the human lung cancer tumor at a mouse back: after 30 days treatment, it reduced the tumor size in volume by about 80%.

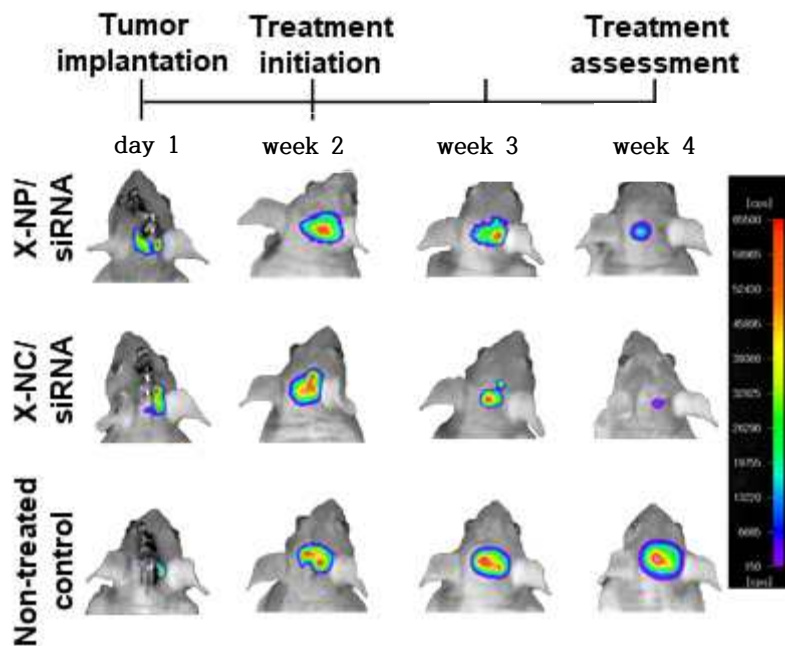


Fig. 2. Treatment effects of siRNA anti-cancer drugs (ACD) of nano particles(X-NP) and nanochain(X-NC) on the mouse brain tumor models (n=4 in each group) after 2 week treatments: ACD of nano particles reduced the brain tumor size in volume by ave. 65% and ACD of nanochain reduced the tumor size in volume by ave. 87%.