Docket #: S19-418

Potent Patched1 (PTCH1) nanobody TI23 for the activation of the Hedgehog signaling pathway

Activation of hedgehog signaling pathway can facilitate stem cell proliferation and holds great promise in regenerative medicine for a variety of indications. Researchers at Stanford reported the discovery of a potent nanobody that inhibits the pathway suppressor Patched1 (PTCH1) and demonstrated its efficacy in vitro as well as in vivo (mice). Unlike existing Patched1 inhibitor, this nanobody does not rely on lipid modification for its action. In addition, this antibody and its sequence can be engineered to achieve tissue-specific delivery (i.e. AAV-mediated delivery, antibody conjugate). This has therapeutic value for improved bone healing, taste receptor cell regeneration, alleviation of colitis or other conditions.

Applications

- **Potential therapeutic to promote bone healing in diabetic patients** for:
  - Skeletal fracture repair
  - Securing bone implants
  - Securing teeth implants
- Taste receptor loss, colitis, prostatic hypertrophy, neuropathy

Advantages

- Soluble hydrophilic nanobody that do not require lipid modification for its activity.
- Has the potential to achieve tissue-specific local delivery to minimize toxicity.

Publications

- Y. Zhang et al Hedgehog pathway activation through nanobody-mediated conformational blockade of the Patched sterol conduit *PNAS* November 17, 2020.

Patents

- Published Application: WO2022067178
- Published Application: 20230391861
- Issued: 12,780,908 (USA)

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