



## Nucleoside and Nucleotide Analogs with Hemiboronic Nucleobases

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### HIGHLIGHTS

- **First-in-Class Boron Integration:** Novel nucleoside analogs (NAs) utilizing boron-modified nucleobases to unlock untapped chemical space.
- **Versatility:** Novel types of molecular interactions with targets.
- **Proven Mechanism:** Demonstrated cellular activation and effective interference with viral RNA production.
- **Expanding the Pipeline:** Opens sophisticated avenues for next-generation drug design where traditional analogs have plateaued.

### OPPORTUNITY

While traditional nucleoside and nucleotide analogs are staples of antiviral therapy, the field has reached a point of diminishing returns; most ribose-modified and nucleobase-modified "chemical territory" has been thoroughly charted. Researchers at the **University of Alberta** are disrupting this plateau by introducing a new class of candidates: **hemiboronic nucleobases**.

By incorporating boron, an unconventional but powerful element in drug design, these analogs bypass the limitations of traditional chemotypes. Early data confirms that these candidates are readily activated within cells and seamlessly utilized by viral polymerases. Once incorporated, they effectively "jam" viral RNA production. Notably, one lead candidate has shown high-efficiency incorporation by the **SARS-CoV-2 RNA-dependent RNA polymerase**, proving its viability as a potent antiviral strategy against evolving respiratory threats.

### COMPETITIVE ADVANTAGE

- **Uncharted Chemical Space:** While most NA research focuses on ribose modifications, this technology targets the nucleobase itself, providing a fresh solution for "hard-to-hit" targets like influenza polymerase.
- **High Bioavailability:** Exceptional cellular activation ensures the drug reaches its target effectively without requiring extreme dosing.
- **Versatile Platform:** Beyond antivirals, the hemiboronic framework provides a modular toolkit for:
  - **Oncology & Neurology:** Targeting aberrant cellular processes in cancer and neurodegenerative diseases.
  - **Precision Synthesis:** Enhancing the production of synthetic DNA/RNA for use in advanced therapeutics and next-gen vaccines.

### STATUS

- Patent pending.

### INVENTORS

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### MORE INFORMATION

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